UnitedHealthcare
Medicare Solutions

Evidence Based Clinical Guidelines

Radiology

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How to Navigate the Evidence-Based Clinical Criteria

This document includes all of the evidenced-based criteria that are used to determine medical necessity for advanced imaging.

The following steps will assist you in determining if your request meets medical necessity:

1. Enter the CPT code you are requesting in the search function of the Adobe document, then select enter. You will be directed to the table of contents, and the code you are looking for will be highlighted. Check the code, and if it is correct, click it and you will be directed to the evidence-based clinical criteria for that CPT code.

2. Identify the indication (by Roman numeral) that most closely describes the clinical problem or working diagnosis.

3. If the indication is not listed, your request will require review by a medical director. Be sure to enter all relevant information in the free text portion of the web-based review or provide it to the clinical reviewer if you are using the telephone.

4. If the clinical indication is listed, additional information may be required in order to demonstrate medical necessity. If additional information is required, [brackets] will indicate which sub elements are necessary.

   The statement in [brackets] only refers to the outline level immediately below the indicator with the bracketed statement. For example, you may see [One of the following]. This means that additional information listed under A or B or C, etc., is needed. You may see [Both], which means that information for both A and B is needed to meet medical necessity. You may see [All], which means that all of the elements listed under the Roman numeral are needed to meet medical necessity.

5. The following is an example of how to use the bracketed statements:

   The indication selected for MRI of the brain without contrast (CPT code 70551) is Demyelinating disease (includes MS). At the level of the Roman numeral, the brackets indicate that information related to one of the sub-elements A or B is needed to meet medical necessity. At the outline level of A (Suspected MS), the brackets indicate that one of the symptoms, 1-16, should be present to meet medical necessity. If B is chosen (Known MS), then information related to sub-element 1 or 2 must be present. If 2 is selected, then one of the symptoms or complaints, a-n, must be present to meet medical necessity.
I. Demyelinating disease (includes MS) [One of the following]¹⁵⁻²⁰

A. Suspected MS [One of the following]
   1. Difficulty walking
   2. Numbness
   3. Bladder dysfunction
   4. Optic neuritis
   5. Weakness of arms or legs
   6. Difficulty with balance
   7. Vertigo
   8. Hearing loss
   9. Constipation
   10. Memory loss
   11. Lhermitte’s sign
   12. Double vision
   13. Blurred vision
   14. Painful movement of the eye or
   15. Nystagmus
   16. Impaired coordination or

B. Known MS [One of the following] (MRI with contrast is often preferred but non contrast may be approved if requested)
   1. Annual scan in asymptomatic or stable member with known MS
   2. New or worsening clinical findings [One of the following]
      a. Difficulty walking
      b. Numbness
      c. Bladder dysfunction
      d. Optic neuritis
      e. Weakness of arms or legs
      f. Difficulty with balance
      g. Vertigo
      h. Hearing loss
      i. Constipation
      j. Memory loss
      k. Lhermitte’s sign
      l. Double vision
      m. Blurred vision
      n. Painful movement of the eye

6. URLs for sources have been included with the references. If the reader selects a reference from the Centers for Medicare & Medicaid Services website, the user must accept the end user License Agreement before being directed to the appropriate reference.

Any reference that refers the reader to the National Comprehensive Cancer Network website requires the reader to enter a username and password to access the appropriate reference. This can be obtained free of charge at the main login page for this website.
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transmission, analysis of fluid dynamics and simulated maximal coronary hyperemia, generation of estimated FFR model, with anatomical data review in comparison with estimated FFR model to reconcile discordant data, interpretation and report  

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0159T Breast MRI CAD

This procedure is considered to be investigational/experimental for commercial plans and not a covered benefit for Medicare.
I. Clinical symptoms\textsuperscript{1-5}
   A. TMJ MRI (CPT\textsuperscript{®} 70336) is the diagnostic study of choice and should be reserved for those who fail a minimum of 6 weeks of non-surgical treatment and who are actively being considered for TMJ surgery.
   B. TMJ MRI (CPT\textsuperscript{®} 70336) is indicated annually for detecting silent TMJ arthritis in children with juvenile idiopathic arthritis (JIA).

II. Internal derangement of the joint including cartilage abnormalities of the TMJ

References:

70450  CT of the Head or Brain without Contrast
70460  CT of the Head or Brain with Contrast
70470  CT of the Head or Brain without and with Contrast

I. Head trauma\(^{1,2}\) [One of the following]
   A. Minor or mild acute closed head trauma without neurologic deficit adult
      1. Glasgow Coma Scale \(\geq 13\)
   B. Mild or moderate acute closed head injury under age 2
   C. Minor or acute closed head injury with focal neurologic deficit
   D. Moderate or severe acute closed head trauma
   E. Subacute or chronic closed head trauma with cognitive and/or neurologic
deficit (MRI without contrast)
   F. Suspected carotid or vertebral dissection (CTA or MRA of head and neck; see
      CPT codes 70498, or 70547)
   G. Penetrating injury, stable neurologically intact
   H. Focal neurologic finding [One of the following]
      1. Motor weakness affecting a limb, or one side of the face or body
      2. Decreased sensation affecting a limb, or one side of the face or body
      3. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or
         trunk)
      4. Confusion including memory loss and disorientation
      5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      6. Aphasia (loss or impairment of the ability to produce or comprehend
         language due to brain damage)
      7. Dysarthria (speech disorder resulting from neurological injury)
      8. Dysphagia with no GI cause
      9. Vertigo with either headache or nystagmus
     10. Numbness, tingling, paresthesias
     11. Decreased level of consciousness
     12. Papilledema
     13. Stiff neck
     14. Drowsiness
     15. New onset of vomiting
     16. Nystagmus
     17. Cranial nerve palsy
     18. Gait disturbance
     19. Personality or behavioral changes
     20. New seizure
     21. Hearing loss or new onset tinnitus
     22. Agitation
     23. Somnolence
     24. Slow response to verbal communication
     25. Sudden falls
     26. Balance problems
I. Drug or alcohol intoxication and evaluation is suboptimal or inadequate
J. Skull fracture

II. Abrupt onset of a neurologic deficit – including stroke and TIA\textsuperscript{3-5}
[One of the following]
A. Motor weakness affecting a limb, or one side of the face or body
B. Decreased sensation affecting a limb, or one side of the face or body
C. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
D. Confusion including memory loss and disorientation
E. Impaired vision, including amaurosis fugax, visual field loss and diplopia
F. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
G. Dysarthria (speech disorder resulting from neurological injury)
H. Dysphagia with no GI cause
I. Vertigo with either headache or nystagmus
J. Numbness, tingling, paresthesias
K. Decreased level of consciousness
L. Papilledema
M. Stiff neck
N. New onset of severe headache
O. Drowsiness
P. New onset of vomiting
Q. Nystagmus
R. Cranial nerve palsy
S. Gait disturbance
T. Personality or behavioral changes
U. New seizure
V. Hearing loss or new onset tinnitus
W. Agitation
X. Somnolence
Y. Slow response to verbal communication
Z. Sudden falls
AA. Balance problems

III. Re-evaluation after stroke [One of the following]
A. Anti-coagulation planned
B. Deteriorating clinical status with new or worsening neurologic findings [One of the following]
   1. Motor weakness affecting a limb, or one side of the face or body
   2. Decreased sensation affecting a limb, or one side of the face or body
   3. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   4. Confusion including memory loss and disorientation
   5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   6. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   7. Dysarthria (speech disorder resulting from neurological injury)
8. Dysphagia with no GI cause
9. Vertigo with either headache or nystagmus
10. Numbness, tingling, paresthesias
11. Decreased level of consciousness
12. Papilledema
13. Stiff neck
14. New onset of severe headache
15. Drowsiness
16. New onset of vomiting
17. Nystagmus
18. Cranial nerve palsy
19. Gait disturbance
20. Personality or behavioral changes
21. New seizure
22. Hearing loss or new onset tinnitus
23. Agitation
24. Somnolence
25. Slow response to verbal communication
26. Sudden falls
27. Balance problems

C. Repeat after recent hemorrhagic stroke

IV. *Headache, indications for imaging*[^6-9] (MRI except for D, J, K and Q) [One of the following]

A. Papilledema

B. Worsened by Valsalva maneuver, coughing straining or postural changes

C. Wakens from sleep

D. Suspected subarachnoid hemorrhage (CT in early phase) with one of the following
   1. With sudden onset of severe, exertional, or “thunderclap” headache
   2. Associated with nausea, vomiting, diplopia, seizure, mental status change, or
   3. History of prior known (documented on CTA, MRA, or angiogram) aneurysm or AVM

E. Infection in an extracranial location

F. Change in mental status, personality, or level of consciousness

G. Suspected carotid or vertebral artery dissection or unilateral Horner’s syndrome (Headache may be unilateral) [One of the following] (CTA or MRA or MRI)
   1. Neck pain
   2. Unilateral facial or orbital pain
   3. Unilateral headaches
   4. Horner’s syndrome, miosis and ptosis (contraction of the iris, drooping eyelid) or
   5. Transient ischemic attacks (TIA)
   6. Minor neck trauma
   7. Rapid onset of headache with strenuous exercise or Valsalva maneuver
H. Head pain that spreads into the lower neck and between the shoulders (may indicate meningeal irritation due to either infection or subarachnoid blood; it is not typical of a benign process)
I. Suspected subdural hematoma with history of major head trauma or minor head trauma in an individual on anticoagulants
J. Thunderclap headache (CT)
K. Worst headache of life (CT)
L. New headache [One of the following]
   1. Abnormal neurologic examination [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body
      c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      d. Confusion including memory loss and disorientation
      e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      g. Dysarthria (speech disorder resulting from neurological injury)
      h. Dysphagia with no GI cause
      i. Vertigo with either headache or nystagmus
      j. Numbness, tingling, paresthesias
      k. Decreased level of consciousness
      l. Papilledema
      m. Stiff neck
      n. New onset of severe headache
      o. Drowsiness
      p. New onset of vomiting
      q. Nystagmus
      r. Cranial nerve palsy
      s. Gait disturbance
      t. Personality or behavioral changes
      u. New seizure
      v. Hearing loss or new onset tinnitus
      w. Agitation
      x. Somnolence
      y. Slow response to verbal communication
      z. Sudden falls
      aa. Balance problems
   2. Aural temperature >38.3°C or 100.9°F
   3. Stiff neck (nuchal rigidity)
   4. History of HIV infection
   5. History of TB
   6. History of sarcoidosis
   7. Age 5 years or less
   8. Over age 50
9. Pregnancy
10. Headache with exertion
11. Documented infection outside the brain
12. Mental status changes
13. Extracranial malignancy

M. Chronic daily headache – headache for 15 or more days a month for at least 3 months
   1. New neurologic deficit (See L1 above) (MRI without and with contrast)
   2. Imaging is not medically necessary if there is a normal neurologic examination and no new features of the headache

N. Known neurofibromatosis

O. Rapidly increasing frequency of headache

P. Personal history of cancer and new headache (MRI without and with)

Q. Change in attack pattern (significant change in character, severity or frequency of headache)
   1. For example: rapidly increasing headache intensity or frequency, transformation of established migraine to chronic daily headaches

V. Seizure\textsuperscript{10-12} (MRI with gadolinium) [One of the following]
   A. Refractory seizures in a candidate for surgery (only if MRI is contraindicated or not available)
   B. New onset of seizures unrelated to trauma with drug use (only if MRI is contraindicated or not available)
   C. New onset of seizures unrelated to trauma with alcohol use (only if MRI is contraindicated or not available)
   D. New-onset seizure unrelated to trauma age 18-40 (only if MRI is contraindicated or not available; MRI without contrast)
   E. New onset of seizure unrelated to trauma older than age 40 (only if MRI is contraindicated or not available; MRI without and with contrast)
   F. New onset of seizures with focal neurologic deficit unrelated to trauma (MRI contraindicated or not available)
   G. New onset of seizures older than 18 following acute trauma
   H. New-onset seizure older than 18 post subacute or chronic trauma (only if MRI is contraindicated or not available; MRI without contrast)
   I. Suspicion of migration anomalies or other morphologic brain abnormalities in children
   J. Suspicion of cortical dysplasia
   K. Partial seizures (MRI without contrast)
   L. Epilepsy

VI. CNS infection or abscess with evidence of infection and neurologic complaints or findings or follow up of known cerebral infection\textsuperscript{13,14} (MRI without and with contrast) [(Both A and B for new infection) or Cor D or E or F]
   A. Findings suggesting infection [One of the following]
      1. Aural temperature >38.3°C or 100.9°F
      2. Leukocytosis, WBC >11,500/cu.mm
3. Known infection elsewhere
4. Immunocompromised patient

B. Other clinical findings [One of the following]
   1. Headache
   2. Acute or subacute ataxia
   3. Drowsiness or confusion
   4. Focal neurological findings
   5. Vomiting
   6. Seizure
   7. Stiff neck
   8. Photophobia
   9. Recurrence of symptoms after antimicrobial therapy

C. Creutzfeldt-Jakob disease

D. Bickerstaff encephalitis – usually follows a viral illness [Both of the following]
   1. Ophthalmoplegia
   2. Cerebellar ataxia

E. Fisher syndrome [Both of the following]
   1. Ophthalmoplegia
   2. Cerebellar ataxia

F. Follow-up during and after completion of therapy to assess effectiveness

VII. Brain tumor\(^{15-23}\) (MRI without and with contrast unless there is a contraindication for MRI)

A. Clarification of brain mass detected on CT exam or prior non contrast MRI
   (For evaluation of possible pituitary problems, please see indication XXXIII below)

B. Evaluation of known primary brain tumor which may include, but not limited to, any of the following brain tumors:
   1. Astrocytoma
   2. Choroid plexus papilloma
   3. Ependymoma
   4. Glioma
   5. Glioblastoma
   6. Glioblastoma multiforme
   7. Hemangioblastoma
   8. Medulloblastoma
   9. Meningioma
   10. Craniopharyngioma
   11. Oligodendroglioma
   12. Pituitary adenoma
   13. Primitive neuroectodermal tumor (PNET)

C. Known brain tumors with any one of the following:
   1. New signs and symptoms or worsening neurological condition [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body

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c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
d. Confusion including memory loss and disorientation
e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
g. Dysarthria (speech disorder resulting from neurological injury)
h. Dysphagia with no GI cause
  i. Vertigo with either headache or nystagmus
i. Numbness, tingling, paresthesias
k. Decreased level of consciousness
  l. Papilledema
m. Stiff neck
n. New onset of severe headache
  o. Drowsiness
p. New onset of vomiting
q. Nystagmus
  r. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure
v. Hearing loss or new onset tinnitus
w. Agitation
  x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems

2. Interval re-evaluation of known brain tumor [One of the following]
a. Anaplastic astrocytoma, anaplastic oligodendroglioma or glioblastoma multiforme or any high grade or aggressive primary brain tumor [One of the following]
  i. Initial Staging
  ii. Re-image after surgery (complete or subtotal)
  iii. Image 2 to 6 weeks after completion of radiation therapy
  iv. Following completion of chemotherapy
  v. For measurable disease undergoing chemotherapy treatments: every 2 cycles
  vi. Surveillance imaging every 3 months for 3 years and every 6 months thereafter
  vii. New signs and symptoms (See 1 above) regardless of date of last imaging
b. Low-grade infiltrative supratentorial astrocytoma or oligodendroglioma
  i. Initial Staging
  ii. Re-image after surgery (complete or subtotal)
  iii. Image 2 to 6 weeks after completion of radiation therapy
iv. Following completion of chemotherapy
v. For measurable disease undergoing chemotherapy treatments: every 2 cycles
vi. Surveillance Imaging every three months for 2 years, then every 6 months for 3 years then annually
c. Ependymoma
i. Initial Staging
ii. Re-image after surgery (complete or subtotal)
iii. For measurable disease undergoing chemotherapy treatments: every 2 cycles
iv. Image 2 to 6 weeks after completion of radiation therapy
v. Following completion of chemotherapy
vi. Surveillance Imaging every three months for 1 year, then every 6 months for 1 year, then annually thereafter
d. Medulloblastoma and supratentorial PNET
i. Initial Staging
ii. Re-image after surgery (complete or subtotal)
iii. Image 2 to 6 weeks after completion of radiation therapy
iv. For measurable disease undergoing chemotherapy treatments: every 2 cycles
v. Following completion of chemotherapy
vi. Surveillance Imaging every three months for 2 years, then every 6 months for 3 years then annually
e. Meningioma
i. Initial Staging of Intracranial Meningioma: MRI Brain without and with (CPT 70553)
ii. Re-image after surgery (complete or subtotal)
iii. Following completion of chemotherapy
iv. For measurable disease undergoing chemotherapy treatments: every 2 cycles
v. Surveillance: If unresected or WHO Grade 1 (benign) or 2 (atypical), image at 3, 6, 12 months after diagnosis then every 6 months for years 2 and 3, then annually for years 4 and 5 and then every 3 years thereafter.
vi. Surveillance - WHO Grade 3 (malignant) image every 3 months for 3 years and then every 6 months thereafter.
f. CNS Lymphoma
i. For Initial Staging
ii. Monitoring response to treatment every 2 cycles (6 to 8 weeks) during chemotherapy
iii. Imaging after completion of chemotherapy to establish new baseline
iv. Surveillance after completion of chemotherapy every 3 months for 2 years then every 6 months for 3 years and then annually thereafter
g. New signs and symptoms or worsening neurological condition [One of the following]
i. Motor weakness affecting a limb, or one side of the face or body
ii. Decreased sensation affecting a limb, or one side of the face or body
iii. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
iv. Confusion including memory loss and disorientation
v. Impaired vision, including amaurosis fugax, visual field loss and diplopia
vi. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
vi. Dysarthria (speech disorder resulting from neurological injury)
ix. Vertigo with either headache or nystagmus
x. Numbness, tingling, paresthesias
xi. Decreased level of consciousness
xii. Papilledema
xiii. Stiff neck
xiv. New onset of severe headache
xv. Drowsiness
xvi. New onset of vomiting
xvii. Nystagmus
xviii. Cranial nerve palsy
xix. Gait disturbance
xx. Personality or behavioral changes
xxi. New seizure
xxii. Hearing loss or new onset tinnitus
xxiii. Agitation
xxiv. Somnolence
xxv. Slow response to verbal communication
xxvi. Sudden falls
xxvii. Balance problems

D. Evaluation for known or suspected brain metastases in patients with known extracranial malignancy (MRI without and with contrast) [One of the following]

1. Routine initial staging for one of the following
   a. Certain sub-types of sarcomas (angiosarcoma and alveolar soft part sarcoma)
   b. Melanoma stage III or higher
   c. Small-cell lung cancer
   d. Non-small cell lung cancer
2. New neurological signs or symptoms with **any known malignancy** [One of the following]
   a. Motor weakness affecting a limb, or one side of the face or body
   b. Decreased sensation affecting a limb, or one side of the face or body
   c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   d. Confusion including memory loss and disorientation
e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
g. Dysarthria (speech disorder resulting from neurological injury)
h. Dysphagia with no GI cause
i. Vertigo with either headache or nystagmus
j. Numbness, tingling, paresthesias
k. Decreased level of consciousness
l. Papilledema
m. Stiff neck
n. New onset of severe headache
o. Drowsiness
p. New onset of vomiting
q. Nystagmus
r. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure
v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems

3. Prior to prophylactic cranial irradiation for small cell lung cancer
4. If prophylactic cranial irradiation is not given for small cell lung cancer
   a. MRI Brain without and with contrast (CPT® 70553) every 4 months for the first 2 years
5. Follow-up known brain metastases during or after chemotherapy [One of the following]
   a. Follow-up every 2 cycles (6 to 8 weeks) during chemotherapy
   b. At completion of chemotherapy to establish a new baseline
   c. Imaging (MRI without and with contrast, and CT should be done only if MRI is absolutely contraindicated or unavailable) every 3 months for 1 year after completion of chemotherapy and every 6 months thereafter
   d. Melanoma stage IIB or higher with no evidence of disease annually for 5 years
6. Follow-up known brain metastases after whole brain radiation therapy [One of the following]
   a. Follow-up after intervention to establish a new baseline
   b. Imaging (preferably MRI) every 3 months for 1 year after completion of whole brain radiation therapy and every 6 months thereafter
   c. Melanoma stage IIB or higher with no evidence of disease annually for 5 years
7. Follow-up known brain metastases after stereotactic radiosurgery (SRS) or CyberKnife® or Gamma Knife radiation treatment
   a. Follow-up after intervention to establish a new baseline
   b. Imaging every 3 months for 1 year after completion of SRS and every 6 months thereafter
   c. Melanoma stage IIB or higher with no evidence of disease annually

8. Follow-up known brain metastases after surgery [One of the following]
   a. Follow up after intervention to establish a new baseline
   b. Imaging (preferably MRI) every 3 months for 1 year after surgery and every 6 months thereafter
   c. Melanoma stage IIB or higher with no evidence of disease annually for 5 years

9. Known brain metastasis with new or worsening symptoms as indicated in number VII.B.2.

E. Cranial nerve palsy (MRI without and with contrast) [One of the following]
   1. Anosmia
   2. Weakness or paralysis of muscles of mastication
   3. Sensory loss in the head and neck
   4. Weakness or paralysis of facial expression
   5. Weakness of the palate
   6. Vocal cord paralysis
   7. Weakness or paralysis of the sternocleidomastoid muscle
   8. Weakness or paralysis of the trapezius
   9. Weakness or paralysis of the tongue

F. Suspected brain tumor (MRI without and with contrast)
   1. New onset of neurologic findings [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body
      c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      d. Confusion including memory loss and disorientation
      e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      g. Dysarthria (speech disorder resulting from neurological injury)
      h. Dysphagia with no GI cause
      i. Vertigo with either headache or nystagmus
      j. Numbness, tingling, paresthesias
      k. Decreased level of consciousness
      l. Papilledema
      m. Stiff neck
      n. New onset of severe headache
      o. Drowsiness
      p. New onset of vomiting
      q. Nystagmus
r. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure
v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems

VIII. Suspected pituitary disease (microadenoma, macroadenoma)

A. Elevated pituitary hormones including precocious puberty

1. Prolactin (PRL) level above normal reference range
2. Growth hormone (GH) ≥5 ng/mL [micrograms/L]
3. Thyroid stimulating hormone (TSH) >4U/mL [mcIU/L]
4. Follicular stimulating hormone (FSH)
   a. Male: >10 mIU/mL
   b. Female: (mIU/mL)
      i. Follicular phase >13
      ii. Luteal phase >13
      iii. Midcycle >22
      iv. Postmenopausal >150
5. Luteinizing hormone (LH)
   a. Male: >8 mIU/mL
   b. Female: (mIU/mL)
      i. Follicular phase >12
      ii. Luteal phase >15
      iii. Midcycle peak >77
      iv. Postmenopausal >40
6. Adrenocorticotropic hormone (ACTH) >46 pg/mL (Cushing’s disease)

B. Hypopituitarism including hypogonadism

1. Pituitary apoplexy
   a. Acute headache with vomiting
   b. Ophthalmoplegia
   c. Amaurosis
   d. Depressed level of consciousness
   e. Bitemporal hemianopsia
2. Acquired hypopituitarism
   a. Cranial irradiation
   b. Brain surgery
   c. Head trauma
   d. Empty sella
   e. Hemochromatosis
   f. Prior brain infection
3. Gonadotropin deficiency or hypogonadism [One of the following]
   a. Male [All of the following]
      i. History [One of the following]
         01. Loss of libido
         02. Impotence
         03. History of undescended testicle or cryptorchidism
         04. History of testicular failure
         05. History of chemotherapy or radiation therapy
         06. Visual field disorder
         07. Decreased body hair
         08. Galactorrhea
         09. Gynecomastia
      ii. Laboratory tests
         01. Low to normal free testosterone, LH and FSH (the laboratory
             values may be requested)
   b. Female [All of the following]
      i. Oligomenorrhea or amenorrhea
      ii. Low normal LH, FSH
4. TSH deficiency < 0.4 and low to low-normal T4 and T3
5. ACTH deficiency (Addison’s disease)
6. ADH deficiency (diabetes insipidus)
7. Growth hormone deficiency [One of the following]
   a. Adults [One of the following]
      i. History of radiation or surgery to the pituitary or hypothalamic
         region
      ii. Decreased levels of 3 or more pituitary hormones (TSH, LH, FSH,
         ACTH, GHRH, ADH)
      iii. Decreased levels of IGF-I (insulin-like growth factor I) based on
           laboratory normal range
      iv. Insulin tolerance test (contraindicated in individuals with history of
          seizures or coronary artery disease)
         01. Growth hormone response ≤10 ng/mL [micrograms/L]
      v. Arginine stimulating test
         01. Growth hormone response ≤10 ng/mL [micrograms/L]
   b. Children with no evidence of malignancy, Crohn’s disease, renal
      disease, hypothyroidism, or Turner’s syndrome, and one of the
      following
      i. Bone age more than 2 standard deviations below the mean for age
      ii. History of surgery or radiation in the pituitary or hypothalamic
          regions
      iii. Growth hormone levels below normal (≤10 ng/mL [micrograms/L]
      iv. History of intrauterine growth retardation
      v. Prader-Willi syndrome
      vi. Children over the age of 1
01. Insulin tolerance test positive with GH response ≤10 ng/mL [micrograms/L]
   vii. Neonate random growth hormone level <20 ng/mL [micrograms/L]

8. Visual problems [One of the following]
   a. Bitemporal visual field loss – loss of peripheral vision bilaterally
   b. Optic atrophy
   c. Drooping eyelid
   d. Diabetes insipidus

C. Known pituitary tumor (adenoma, microadenoma, macroadenoma)
   1. Following transsphenoidal resection
   2. Following radiation therapy
   3. New signs or symptoms such as visual changes, new headache, new onset of vomiting, papilledema, drooping eyelid, optic atrophy
   4. Follow-up of asymptomatic nonfunctioning microadenoma <10mm in size
      a. MRI at one year
      b. MRI every 1-2 years for 3 years and then less frequently as long as tumor does not increase in size
   5. Follow-up of asymptomatic nonfunctioning macroadenoma 6 months after the initial diagnosis and then annually

IX. Evaluation after intervention or surgery (CT should be performed for this indication if MRI is absolutely contraindicated) [One of the following]
   A. New or worsening neurologic condition [One of the following]
      1. Motor weakness affecting a limb, or one side of the face or body
      2. Decreased sensation affecting a limb, or one side of the face or body
      3. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      4. Confusion including memory loss and disorientation
      5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      6. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      7. Dysarthria (speech disorder resulting from neurological injury)
      8. Dysphagia with no GI cause
      9. Vertigo with either headache or nystagmus
      10. Numbness, tingling, paresthesias
      11. Decreased level of consciousness
      12. Papilledema
      13. Stiff neck
      14. New onset of severe headache
      15. Drowsiness
      16. New onset of vomiting
      17. Nystagmus
      18. Cranial nerve palsy
      19. Gait disturbance
      20. Personality or behavioral changes
      21. New seizure
22. Hearing loss or new onset tinnitus
23. Agitation
24. Somnolence
25. Slow response to verbal communication
26. Sudden falls
27. Balance problems
B. Aneurysm clip [One of the following]
   1. Stable with no change in neurologic findings
      a. Annual
   2. New neurologic findings (See A above)

X. **Suspected acoustic neuroma (schwannoma) or cerebellar pontine angle tumor**\(^{33-35}\) [One of the following]
   A. Findings/test results [One of the following]
      1. Asymmetric sensorineural hearing loss by audiometry
      2. Facial weakness
      3. Altered sense of taste
      4. Tinnitus
      5. Balance problems
      6. Facial numbness
   B. Neurofibromatosis

XI. **Hydrocephalus**\(^{36-37}\) [One of the following]
   A. Suspected obstructive hydrocephalus [Clinical findings and supportive history]
      1. Clinical findings [One of the following]
         a. Headache
         b. Papilledema
         c. Diplopia
         d. Mental status changes
         e. Gait disturbance or ataxia (People with ataxia experience a failure of muscle control in their arms and legs, resulting in a lack of balance and coordination or a disturbance of gait)
         f. Seizure
      2. History of [One of the following]
         a. Arteriovenous malformation (AVM)
         b. Aneurysm
         c. Intraventricular or SAH
         d. Meningitis
         e. Known hydrocephalus
   B. Normal pressure hydrocephalus (NPH) [One of the following]
      1. Gait disturbance (shuffling, magnetic, wide based, disequilibrium, and slow gait)
      2. Motor perseveration (tremors)
      3. Urinary incontinence, urgency or frequency
      4. Dementia
      5. Known NPH with worsening symptoms
   C. Suspicion of VP (ventriculoperitoneal) shunt malfunction
XII. Evaluation of tinnitus\textsuperscript{38-40} (ringing, hissing, buzzing, roaring, clicking, or rough sounds heard by patient)

XIII. Arnold-Chiari malformation\textsuperscript{7} [One of the following]
A. Cranial nerve palsy
B. Headache
C. Incontinence
D. Lumbar myelomeningocele
E. Neck or back pain
F. Sensory loss
G. Tethered cord
H. Unsteady gait
I. Lower extremity spasticity
J. Follow up known Chiari with new or changed symptoms

XIV. Craniosynostosis

XV. Fibrous dysplasia

XVI. Macrocephaly
A. Head circumference greater than 2 standard deviations average for age

XVII. Microcephaly
A. Head circumference smaller than 2 standard deviations average for age

XVIII. Encephalocele

XIX. Cephalohematoma

XX. Proptosis including thyroid eye disease and exophthalmus\textsuperscript{41} [One of the following]
A. Orbital asymmetry in a child with visual loss
B. Adult with painful visual loss
C. Hyperthyroidism with visual loss or visual compromise (Graves’ disease)

XXI. Visual field deficit\textsuperscript{41} (MRI) [One of the following]
A. Bitemporal hemianopsia (loss of peripheral vision)
B. Homonymous hemianopsia (loss of vision in the nasal half of one eye and the outer half of the other eye)
C. Scotoma (loss of central vision)
D. Heteronymous hemianopsia (loss of vision in either the nasal half or the outer half of both eyes)

XXII. Hearing loss\textsuperscript{33-35} [One of the following]
A. Suspected cholesteatoma and audiogram demonstrating conductive hearing loss (CT of the temporal bone) and one of the following
   1. Acute and intermittent vertigo
   2. Painless otorrhea
   3. Purulent drainage from the ear or mastoid area
   4. Purulent drainage and granulation tissue in the ear
B. Conductive hearing loss
   1. Must have audiogram documenting conductive hearing loss
C. Total deafness, congenital hearing loss (CT of the temporal bone)
D. Preoperative planning for cochlear implant (CT of the temporal bone)
E. Fluctuating hearing loss
   1. History of meningitis
F. Glomus tumor (MRI)
   1. Reddish-blue mass in the ear
G. Sensorineural hearing loss on recent audiogram (MRI of the head without and with contrast)
H. Mixed conductive and sensorineural hearing loss on recent audiogram

XXIII. Vertigo
A. Episodic with or without associated hearing loss or tinnitus
B. Central vertigo with or without other symptoms (MRI of the brain without and with contrast)

XXIV. Follow up proven subdural hematoma, epidural, subarachnoid, or intracerebral (parenchymal) hemorrhage
   [One of the following]
A. Motor weakness affecting a limb, or one side of the face or body
B. Decreased sensation affecting a limb, or one side of the face or body
C. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
D. Confusion including memory loss and disorientation
E. Impaired vision, including amaurosis fugax, visual field loss and diplopia
F. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
G. Dysarthria (speech disorder resulting from neurological injury)
H. Dysphagia with no GI cause
I. Vertigo with either headache or nystagmus
J. Numbness, tingling, paresthesias
K. Decreased level of consciousness
L. Papilledema
M. Stiff neck
N. New onset of severe headache
O. Drowsiness
P. New onset of vomiting
Q. Nystagmus
R. Cranial nerve palsy
S. Gait disturbance
T. Personality or behavioral changes
U. New seizure
V. Hearing loss or new onset tinnitus
W. Agitation
X. Somnolence
Y. Slow response to verbal communication
Z. Sudden falls
AA. Balance problems
BB. Follow up within 36 hours of initial presentation if not performed previously
CC. Interval follow up with or without change in clinical signs or symptoms

XXV. Suspected intracranial hemorrhage[^3][^44] [One of the following]

A. Head trauma [One of the following]
   1. Amnesia
   2. Altered level of consciousness or loss of consciousness
   3. Vomiting
   4. Neurologic symptoms
   5. Seizure
   6. Coagulopathy previously diagnosed (or current treatment with heparin or Coumadin®)
   7. Skull fracture
   8. Ataxia
   9. Aphasia
   10. Decreased sensation in a limb
   11. Visual field loss
   12. Double vision
   13. Memory loss

B. Suspicion of acute subarachnoid hemorrhage [One of the following]
   1. Vomiting
   2. Sudden onset of severe hypertension
   3. Decreased level of consciousness
   4. Thunderclap headache
   5. Worst headache of one’s life
   6. Headache and known aneurysm
   7. Headache and first degree relative with aneurysm
   8. Treated aneurysm and/or AVM with new headache or findings on neurologic examination
   9. Stiff neck
   10. Seizure
   11. Third nerve palsy

C. Intracerebral (parenchymal) hemorrhage [One of the following]
   1. Hypertension with new onset headache
   2. Known brain metastases with change in neurologic status
   3. New onset of neurologic symptoms [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body
      c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      d. Confusion including memory loss and disorientation
      e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      g. Dysarthria (speech disorder resulting from neurological injury)
h. Dysphagia with no GI cause
i. Vertigo with either headache or nystagmus
j. Numbness, tingling, paresthesias
k. Decreased level of consciousness
l. Papilledema
m. Stiff neck
n. New onset of severe headache
o. Drowsiness
p. New onset of vomiting
q. Nystagmus
r. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure
v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems
4. Follow-up within 36 hours of initial presentation if not performed previously
5. Interval follow-up with or without change in signs and symptoms

XXVI. Papilledema or other signs of increased intracerebral pressure (MRI)

XXVII. Acute, chronic or progressive mental status changes (MRI)
A. Deteriorating cognitive function [One of the following]
   1. Progressive loss of memory
   2. Confusion
   3. Disorientation
   4. Personality changes

XXVIII. Evaluation of psychiatric disorders (CT Head without contrast)
A. Bipolar disorder, schizophrenia, and related disorders may require advanced imaging in the following clinical circumstances:
   1. Atypical clinical presentation
   2. Acute onset
   3. Late onset over age 40
   4. Presents in setting of general medical illness or intensive care setting
   5. Non-auditory hallucinations (e.g., visual, tactile, olfactory)
   6. Patients who fail to respond to treatment in the expected manner and who manifest features suggestive of an organic brain disorder (for example, focal deficits, severe headache, or seizures)
XXIX. Bell’s palsy, with unusual presentation\textsuperscript{45-46} [One of the following]

Bell’s palsy is the sudden onset of temporary facial paralysis which is the result of an insult to the 7th cranial nerve or the facial nerve. It usually presents as unilateral paralysis of the face including the eyelid and decreased tearing.

A. No improvement in facial paresis after one month
B. Second paralysis on the same side
C. Hearing loss
D. Multiple cranial nerve deficits
E. Weakness or sensory loss in an extremity
F. Bilateral symptoms

XXX. Planning for stereotactic or gamma knife surgery- may be approved with MRI of the brain

XXXI. Recurrent Laryngeal Palsy – The following can be considered with unilateral vocal cord/fold palsy identified by laryngoscopy:\textsuperscript{47}

A. MRI head without and with contrast (CPT\textsuperscript{®}70553) and/or MRI neck without and with contrast (CPT\textsuperscript{®}70543); or
B. MRI head without contrast (CPT\textsuperscript{®}70551) and/or MRI neck without contrast (CPT\textsuperscript{®}70540); or
C. IF MRI is not available, CT head without and with contrast (CPT\textsuperscript{®}70470) and/or CT neck with contrast (CPT\textsuperscript{®}70491)
   1. Chest CT with contrast (CPT\textsuperscript{®}71260) may be added with left vocal cord palsy

XXXII. Eye Disorders\textsuperscript{48-55}

A. MRI head without and with contrast (CPT\textsuperscript{®} 70553) and/or MRI orbit without and with contrast (CPT\textsuperscript{®} 70543) or MRI head without contrast (CPT\textsuperscript{®} 70551) and/or MRI orbit without contrast (CPT\textsuperscript{®} 70540).\textsuperscript{1, 2, 3} may be considered in the following scenarios:
   1. Anisocoria which is of new onset (e.g. not present in previous photographs) and >/= 1mm
   2. Acute or progressive vision loss due to any cause, including suspected optic neuritis
   3. Ophthalmoplegia
   4. Binocular Diplopia
   5. Horner’s Syndrome, for which CT Neck with contrast and/or CT Chest with contrast may be considered in addition to the head or orbital imaging
   6. CT head without contrast may be substituted for the MRI imaging if there has been a head injury
B. Evaluation of a third nerve palsy may be accomplished with an MRI head without and with contrast(CPT\textsuperscript{®} 70553) and/or MRA brain without contrast
   1. CT head without and with contrast (CPT\textsuperscript{®} 70470) and/or CT orbit with contrast (CPT\textsuperscript{®} 70481) can be approved if there is a clinical question of blood in the subarachnoid space.
C. If MRI contraindicated or cannot be performed, CT head without and with contrast (CPT® 70470), CT orbit with contrast (CPT® 70481) or CT orbit without and with contrast (CPT® 70482) may be considered as substitutes

XXXIII. Pituitary

A. Bitemporal hemianopsia is the classic finding
B. Endocrine laboratory studies should be performed prior to considering advanced imaging, including Prolactin levels; thyroid function levels should also be checked to evaluate for untreated or inadequately treated hypothyroidism as a cause of hyperprolactinemia and pituitary hyperplasia
C. Pituitary imaging is primarily performed with MRI head without or without and with contrast (CPT® 70551 or CPT® 70553)
   1. MRI Orbit, Face, Neck (CPT® 70543) or Head CT without and with contrast (CPT® 70470) are alternatives
   2. CT Head without contrast (CPT® 70450) or without and with contrast (CPT® 70470) and/or CT maxillofacial without contrast (CPT® 70486) is occasionally used in addition to MRI to visualize perisellar bony structures in the preoperative evaluation of certain sellar tumors and for preoperative planning for transphenoidal approaches

### PITUITARY IMAGING (Continued next page.)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Initial Imaging</th>
<th>Repeat Imaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acromegaly <em>(Elevated IGF-1 confirmed by lack of suppression of growth hormone on glucose suppression testing, with or without acromegaly)</em></td>
<td>MRI Head without and with contrast (CPT® 70553)</td>
<td>MRI Brain without and with contrast (CPT® 70553)</td>
</tr>
<tr>
<td>Microadenoma: Nonfunctioning, unexplained pituitary asymmetries, and incidentally found small tumors (&lt;10 mm)</td>
<td>MRI head without contrast and with contrast (CPT® 70553)</td>
<td>MRI head without contrast and with contrast (CPT® 70553) at: -6 and 12 months, then yearly for 3 years if stable. After 3 years, then every other year for the next 6 years, then every 5 years if stable</td>
</tr>
</tbody>
</table>
**Prolactinomas***

MRI head without and with contrast (CPT® 70553) with:
- Unexplained elevated prolactin level above normal reference range.
- After initial start of dopamine agonist therapy, repeat MRI in 1 year (or in 3 months if macroprolactinoma), also repeat if prolactin levels continue to rise while on dopaminergic agents, or if new symptoms emerge (e.g., galactorrhea, visual disturbances, headaches, or other hormonal disorders occur).
- Image after 2 years of dopamine agonist treatment for those who are being considered for discontinuation of treatment due to remission.
- After 2 years of dopamine agonist therapy, for those who have achieved normal Prolactin levels and no visible tumor remnant, and for whom dopamine agonists have been discontinued or tapered, image if prolactin level increases above normal range.
- Galactorrhea/nipple discharge with normal prolactin and thyroid function levels.

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**TSH, FSH, ACTH and LH producing***

MRI head without and with contrast (CPT® 70553) when hormone levels are inappropriately elevated

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**Male Hypogonadism***

MRI head without and with contrast (CPT® 70553) if:
- Severe secondary hypogonadism (morning serum testosterone level < 150 ng/dl and low or normal LH and FSH levels)
- Serum, free, or bioavailable morning testosterone level below normal range and low or normal LH and FSH levels accompanied by one of the following:
  - Panhypopituitarism, hyperprolactinemia, symptoms or signs of tumor mass effect (e.g. headache, visual impairment, or visual field deficit), *****suspected alterations in sex hormone binding globulin (SHBG)

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**Panhypopituitarism***

MRI head without and with contrast (CPT® 70553) if hypothyroidism with low TSH

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**PITUITARY IMAGING (Continued . . .)**

<table>
<thead>
<tr>
<th>Indication</th>
<th>Initial Imaging</th>
<th>Repeat Imaging for Non-Operative Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADH ABNORMALITIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes Insipidus (DI)</td>
<td>MRI head without and with contrast (CPT® 70553) if: Laboratory testing consistent with DI (serum osmolality should be high and urine osmolality should be low) and etiology uncertain</td>
<td>NA</td>
</tr>
<tr>
<td>Syndrome of Inappropriate ADH (SIADH)</td>
<td>MRI head without and with contrast (CPT® 70553) if: Etiology remains uncertain or is thought to be in the nervous system Urine osmolality should be high and serum osmolality low</td>
<td>NA</td>
</tr>
<tr>
<td>Macroadenoma (&gt;10 mm) (if not confirmed on MRI)</td>
<td>MRI head without and with contrast (CPT® 70553)</td>
<td>MRI head without and with contrast (CPT® 70553) every:</td>
</tr>
</tbody>
</table>

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surgically removed and normal hormonal testing

-6 months for the first year; and then,
-annually for 5 years (longer if craniopharyngiomas);
every 6 months if treatment is deferred

Other Pituitary Region Tumors**
Evaluation may require CT in addition to MRI to evaluate for hyperostosis.
Requests will be sent for Medical Director review.

Enlarged/Empty Sella Turcica***
Head CT without and with contrast (CPT® 70470) or, MRI head without and with contrast (CPT® 70553) to
exclude residual pituitary tumor and to
-assess the position of the chiasm since herniation into the sella, causes Chiasmatic-type visual loss
MRI without and with contrast (CPT® 70553)
1-5 years after the initial study can be performed.

Post-operatively, follow-up pituitary imaging is generally done at the discretion of the neurosurgeon, usually at 3 months if stable

XXXIV. Pediatric Epilepsy and other seizure disorders60-66 - A recent (within 60 days) face-to-face evaluation including a detailed history, physical examination with a thorough neurologic examination, and appropriate laboratory studies should be performed prior to considering advanced imaging, unless the patient is undergoing guideline-supported scheduled follow-up imaging evaluation. This clinical evaluation should also include family history and (whenever possible) the accounts of eyewitnesses to the event(s).

A. Initial Imaging of Non-Febrile seizures

1. MRI brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
   a. First-time seizure in child ≥12 months of age that has no known cause and is not associated with fever
   b. Inconclusive findings on recent cranial ultrasound or CT Head
   c. Partial seizures
   d. Focal neurologic deficits
   e. Patients requiring sedation should generally not have noncontrast MRI studies. See Pediatric Head Imaging Modality General Considerations (noted below)

2. CT Head without contrast (CPT® 70450) is indicated for the following:
   a. First-time seizure in child associated with recent head trauma
   b. Patient cannot safely undergo MRI (avoidance of sedation is not an indication)

3. Cranial ultrasound (CPT® 76506) is indicated for the following:
   a. First-time seizure in child in child <12 months of age that has no known cause and is not associated with fever if the infant has an open fontanelle
4. The following imaging tests do not generally add valuable information initially and are not indicated for the initial evaluation of seizures in children:
   a. CTA Head or Neck
   b. MRA Head or Neck
   c. MRI Cervical, Thoracic, Lumbar Spine

B. Repeat imaging on indication
   1. Repeat MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
      a. New or worsening focal neurologic deficits
      b. Increase in severity or frequency of seizures despite documented therapeutic antiepileptic drug levels
      c. Change in seizure type
      d. Preoperative evaluation for epilepsy surgery
      e. Patients requiring sedation should generally not have noncontrast MRI studies. See *Pediatric Head Imaging Modality General Considerations (noted below).*

C. Evaluation for Epilepsy Surgery
   1. These cases should be forwarded for medical review
   2. PET Brain Metabolic (CPT® 78608)
   3. Functional MRI Brain (CPT® 70554 or 70555)
   4. MR Spectroscopy (CPT® 76390)
      a. NOTE: Certain payers consider MR Spectroscopy investigational/experimental, and those coverage policies take precedence over eviCore Imaging Guidelines.

D. Febrile Seizures
   1. Neuroimaging should not be performed in the routine evaluation of children with simple febrile seizures

XXXV. *Pediatric Head Imaging Modality General Considerations*67-87

A. MRI
   1. MRI is the preferred modality for imaging the pediatric head unless otherwise stated in a specific guideline section
   2. Due to the length of time for image acquisition and the need for stillness, anesthesia is required for almost all infants and young children (age <7 years), as well as older children with delays in development or maturity. In this patient population, MRI imaging sessions should be planned with a goal of avoiding a short-interval repeat anesthesia exposure due to insufficient information using the following considerations:
      a. MRI should always be performed without and with contrast unless there is a specific contraindication to gadolinium use, since the patient already has intravenous access for anesthesia
      b. If multiple body areas are supported by MSI guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same anesthesia session
B. CT
   1. CT is generally inferior to MRI for imaging the pediatric head, but has specific indications in which it is the preferred modality listed in specific sections of these guidelines
      a. CT should not be used to replace MRI in an attempt to avoid sedation unless listed as a recommended study in a specific guideline section

C. Ultrasound
   1. Cranial ultrasound (CPT® 76506) is a non-invasive means of evaluating for intracranial abnormalities in infants with an open anterior fontanelle
   2. Transcranial Doppler ultrasonography has some utility in select populations of older children with known or suspected intracranial vascular disease

D. Nuclear Medicine
   1. Nuclear medicine studies other than metabolic PET imaging on the pediatric brain or head are rarely performed in an elective outpatient setting, but the following studies can be approved when requested for the following indications:
      a. Brain Scintigraphy with or without vascular flow (any one of CPT® 78600, 78601, 78605, or 78606)
         i. Establish brain death (rarely done in outpatient setting)
      b. Brain Imaging SPECT with Ioflupane I-23 (CPT® 78607)
         i. Immunocompromised patients with mass lesion detected on CT or MRI for differentiation between lymphoma and infection
      c. Brain Imaging Vascular Flow (CPT® 78610)
         i. Cerebral ischemia
         ii. Establish brain death
      d. CSF Leakage Detection (CPT® 78650)
         i. Evaluation of CSF rhinorrhea or otorrhea, or refractory post-lumbar puncture headache
      e. Radiopharmaceutical Dacryocystography (CPT® 78660)
         i. Suspected obstruction of nasolacrimal duct due to excessive tearing

XXXVI. Dementia
   A. CT Head without contrast (CPT® 70450) is considered after an initial clinical diagnosis of dementia\textsuperscript{88-89} has been established based on a detailed history of memory loss with impairment of day-to-day activities confirmed by family members or others with knowledge of the patient’s status and/or abnormal bedside mental status testing such as Mini-Mental Status Exam (MMSE), Montreal Cognitive Assessment Survey (MOCA), and the St. Louis University Mental Status (SLUMS). Neuropsychological testing can be performed when history and bedside mental status examination cannot provide a confident diagnosis\textsuperscript{90-91}.

XXXVII. Pediatric Scalp and Skull Lesions\textsuperscript{92}
   A. In neonates and young infants, scalp masses include:
1. Congenital lesions (cephalocele—discussed above, dermoid cysts, epidermoid cyst)
2. Vascular lesions (hemangioma, sinus pericranii)
3. Extracranial hemorrhage related to birth trauma (caput succedaneum, cephalohematoma, subgaleal hematoma)
4. After the first year of life, malignant tumors, such as Langerhans cell histiocytosis metastases from neuroblastoma and rhabdomyosarcoma are an additional cause of a scalp mass

B. The following imaging is considered for newborns with palpable scalp and skull lesions:
   1. Head ultrasound (CPT® 76506) or plain X-rays of the skull can be approved as an initial imaging study.
   2. If the X-ray or ultrasound are abnormal and associated anomalies are suspected, CT Brain without and with contrast (CPT® 70470) is indicated.

XXXVIII. Sinus Imaging in Adults

There is no evidence to support advanced imaging of acute (<4 weeks) and subacute (4 to 12 weeks) uncomplicated rhinosinusitis. There is no evidence to support routine follow-up advanced imaging after treatment with clinical improvement of sinusitis. Advanced imaging may be considered in the following scenarios:

A. Orbital and/or Intracranial complications with ocular and/or neurological deficit
B. A new obstructing sinus mass, including retention cysts and nasal polyps, that obscures the physician’s view on endoscopy
C. Fungal Sinusitis

References


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43. Proctor MR. Intracranial Subdural Hematoma in Children: Clinical Features, Evaluation and Management.


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48. UpToDate, Approach to the patient with anisocoria, Literature review current through: Feb 2014. | This topic last updated: Jan 9, 2014. (normal pupil difference is <= 4mm.).


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71. Diagnostic Imaging: Pediatric Neuroradiology by A. James Barkovich, Anna Illner, Kevin R. Moore, Ellen Grant, Blaise V. Jones.
82. Thrall JH, Zeissman HA, Nuclear Medicine, the Requisites, Mosby 2001, 312-313.


VTI exam (studies performed to provide a virtual anatomy guide for use during surgery) are becoming increasingly more common.\textsuperscript{1,2}

I. **Suspected orbital tumor (See MRI without and with contrast)** including but not limited to:
   A. Orbital/Ocular Melanoma
   B. Squamous Cell Carcinoma of the Head and Neck region with suspected orbital involvement

II. **Evaluation of tinnitus\textsuperscript{14-16} (ringing, hissing, buzzing, roaring, clicking, or rough sounds heard by patient) (MRI)**
   A. Tinnitus localized to a single ear
   B. Pulsatile tinnitus
   C. Symmetric hearing loss

III. **Evaluation of vertigo\textsuperscript{17,18} (MRI brain; CT temporal bone without contrast (CPT\textsuperscript{®} 70480) may be considered in addition to the MRI evaluation if concern for trauma, superior canal dehiscence or other boney abnormalities) [One of the following]**
   A. Episodic with or without associated hearing loss or tinnitus
   B. Central vertigo with or without other symptoms
      1. Equivocal or unusual nystagmus findings, including direction changing or persistent downbeat nystagmus
      2. Absent head thrust sign
      3. Short duration (minutes) recurrent attacks
      4. Any associated neurological signs or symptoms
      5. Cerebrovascular symptoms of TIA or CVA,
         a. Examples include drop attacks, seizures, coincident headache, ataxia, aura or focal neurological findings
         b. Features atypical for benign positional vertigo, which may include abnormal cranial nerve findings, visual disturbances, and severe headache
IV. Hearing loss\textsuperscript{17,19,21,22} [One of the following]
   A. Suspected **cholesteatoma** with conductive hearing loss documented on an audiogram [One of the following]
      1. Acute and intermittent vertigo
      2. Painless otorrhea
      3. Purulent drainage from the ear or mastoid area
      4. Purulent drainage and granulation tissue in the ear
   B. Conductive hearing loss
      1. Must have audiogram documenting conductive hearing loss
   C. Total deafness, congenital hearing loss (CT of the temporal bone)
   D. Preoperative planning for cochlear implant (CT of the temporal bone)
   E. Fluctuating hearing loss
   F. Glomus tumor (MRI)
      1. Reddish-blue mass in the ear
   G. Sensorineural hearing loss on recent audiogram (MRI of the head without and with contrast)
   H. Mixed conductive and sensorineural hearing loss on recent audiogram

V. Evaluation of congenital anomalies of the ear\textsuperscript{20}

VI. Cholesteatoma\textsuperscript{21, 22}
   A. Conductive hearing loss on an audiogram

VII. Trauma\textsuperscript{23,24} [One of the following]
   A. Infra orbital numbness
   B. Enophthalmos
   C. Inhibited movement of eyes, e.g. diplopia
   D. Suspected foreign body in globe or orbit
   E. Bleeding from ear after injury
   F. Deformation of the globe
   G. Loss of vision

VIII. Evaluation of severe infections of the ear (malignant otitis externa)\textsuperscript{21}

IX. Cochlear implant evaluation\textsuperscript{17}

X. Congenital hearing loss\textsuperscript{17}

XI. Visual field deficit or vision loss\textsuperscript{25} (MRI without and with contrast) [One of the following]
   A. Bitemporal hemianopsia (loss of peripheral vision)
   B. Homonymous hemianopsia (loss of vision in the nose half of one eye and the outer uveitis half of the other eye)
   C. Scotoma (loss of central vision)
   D. Heteronymous hemianopsia (loss of vision in either the nose half or the outer half of both eyes)
XII. Congenital anomaly of the orbit

XIII. Otosclerosis

XIV. Suspected pituitary disease (microadenoma, macroadenoma) (MRI of the brain with and without contrast) [One of the following]

A. Endocrine laboratory studies should be performed prior to considering advanced imaging, including Prolactin levels; thyroid function levels should also be checked to evaluate for untreated or inadequately treated hypothyroidism as a cause of hyperprolactinemia and pituitary hyperplasia

B. Pituitary imaging is primarily performed with MRI head without and with contrast (CPT® 70553)
   1. If a pituitary abnormality is reported incidentally on a MRI Brain or CT Brain performed for other reasons, a follow-up dedicated pituitary study may be obtained (Brain MRI Brain without and with contrast CPT® 70553 or MRI Orbit/Face/Neck CPT® 70543. CPT® 70553 covers both brain and dedicated pituitary if performed at the same time; no additional CPT® codes are needed.)

C. Prolactinomas
   1. Unexplained elevated prolactin: normal prolactin level above normal reference
      a. After initial start of dopamine agonist therapy, repeat MRI in 1 year (or in 3 months if macroprolactinoma), also repeat if prolactin levels continue to rise while on dopaminergic agents, or if new symptoms emerge (e.g., galactorrhea, visual disturbances, headaches, or other hormonal disorders occur)
      b. After 2 years of dopamine agonist therapy, for those who have achieved normal Prolactin levels and no visible tumor remnant, and for whom dopamine agonists have been discontinued or tapered, image if prolactin level increases above normal range.
      c. Galactorrhea/nipple discharge with normal prolactin and thyroid function levels

D. Acromegaly: (Elevated IGF-1 confirmed by lack of suppression of growth hormone on glucose suppression testing, with or without acromegaly)
   1. At least 12 weeks after surgery to evaluate for residual tumor
   2. If treated with Pegvisomant, 6 to 12 months after treatment initiated, then annually if stable or if hormone levels increase or neurological findings appear

E. Nonfunctioning Microadenomas: MRI at 6 and 12 months, then yearly for 3 years if stable. After 3 years then every year for the next 6 years, then every 5 years if stable.
   1. TSH, FSH, ACTH and LH producing: MRI head without and with contrast (CPT® 70553) when hormone levels are inappropriately elevated.
   2. Adrenocorticotropic hormone (ACTH) >46 pg/mL (Cushing’s disease)
   3. Precocious puberty [One of the following]
a. Defined as the appearance of secondary sexual characteristics before age 8 in girls and before age 9 in boys.
b. When precocious puberty is documented on physical examination, endocrine lab studies are not necessary prior to advanced imaging.

F. Hypopituitarism including hypogonadism [One of the following]
1. Pituitary apoplexy [One of the following]
   a. Acute headache with vomiting or
   b. Ophthalmoplegia
   c. Amaurosis
   d. Depressed level of consciousness
   e. Bitemporal hemianopsia
2. Acquired hypopituitarism [One of the following]
   a. Cranial irradiation
   b. Brain surgery
   c. Head trauma
   d. Empty sella
   e. Hemochromatosis
   f. Prior brain infection
   g. Known pituitary tumor
   h. Langerhans cell histiocytosis of the pituitary
3. Gonadotropin deficiency or hypogonadism [One of the following]
   a. Male [All of the following]
      i. History [One of the following]
         01. Loss of libido
         02. Impotence
         03. History of undescended testicle or cryptorchism
         04. History of testicular failure
         05. History of chemotherapy or radiation therapy
         06. Visual field disorder
         07. Decreased body hair
         08. Galactorrhea
         09. Gynecomastia
      ii. Laboratory tests
         01. Low to normal free testosterone (serum total testosterone < 80% of the lower limit of normal), LH and FSH (laboratory values may be requested)
   b. Female [All of the following]
      i. Oligomenorrhea or amenorrhea
      ii. Low normal LH, FSH
4. TSH deficiency with TSH < 0.4
5. ACTH deficiency (Addison’s disease)
6. ADH deficiency (diabetes insipidus)
7. Growth hormone deficiency [One of the following]
   a. Adults [One of the following]
      i. History of radiation or surgery to the pituitary or hypothalamic region
ii. Decreased levels of 3 or more pituitary hormones (TSH, LH, FSH, ACTH, GHRH, ADH)

iii. Decreased levels of IGF-I (insulin-like growth factor I) based on laboratory normal range

iv. Insulin tolerance test (contraindicated in individuals with history of seizures or coronary artery disease)
   01. Growth hormone response ≤ 10 ng/mL [micrograms/L]

v. Arginine stimulating test
   01. Growth hormone response ≤ 10 ng/mL [micrograms/L]

b. Children with no evidence of malignancy, Crohn’s disease, renal disease, hypothyroidism, or Turner’s syndrome, and one of the following:
   i. Bone age more than 2 standard deviations below the mean for age
   ii. History of surgery or radiation in the pituitary or hypothalamus regions
   iii. Growth hormone levels below normal (≤ 10 ng/mL [micrograms/L])
   iv. History of intrauterine growth retardation
   v. Prader-Willi syndrome
   vi. Children over the age of 1
      01. Insulin tolerance test positive with GH response ≤ 10 ng/mL [micrograms/L]

vii. Neonate random growth hormone level < 20 ng/mL [micrograms/L]

8. Visual problems [One of the following]
   a. Bitemporal visual field loss – loss of peripheral vision bilaterally
   b. Optic atrophy
   c. Diabetes insipidus

G. Known pituitary tumor (adenoma, microadenoma, macroadenoma)
   1. Following transsphenoidal resection
   2. Following radiation therapy
   3. New signs or symptoms such as visual changes, new headache, new onset of vomiting, papilledema, drooping eyelid, optic atrophy
   4. Follow-up of asymptomatic nonfunctioning microadenoma < 10mm in size
      a. MRI at 6 and 12 months, then
      b. MRI annually for 3 years, then every other year for the next 6 years, then every 5 years if stable.
   5. Follow-up of asymptomatic nonfunctioning macroadenoma 6 months after the initial diagnosis for the first year and then annually for 5 years. Or every 6 months if treatment is deferred.

XV. Proptosis25 (or exophthalmos) (MRI) [One of the following]
   A. Orbital asymmetry in a child with visual loss
   B. Adult with painful visual loss

XVI. Conductive hearing loss17
   A. Documented by audiometry
XVII. Eye Disorders

A. MRI head without and with contrast (CPT® 70553) and/or MRI orbit without and with contrast (CPT® 70543) or MRI head without contrast (CPT® 70551) and/or MRI orbit without contrast (CPT® 70540)\(^1,2,3\) may be considered in the following scenarios:

1. Anisocoria which is of new onset (e.g. not present in previous photographs) and \(>= 1\)mm
2. Acute or progressive vision loss due to any cause, including suspected optic neuritis
3. Ophthalmoplegia
4. Binocular Diplopia
5. Horner’s Syndrome, for which CT Neck with contrast and/or CT Chest with contrast may be considered in addition to the head or orbital imaging
6. CT head without contrast (CPT® 70450) may be substituted for the MRI imaging if there has been a head injury

B. Evaluation of a third nerve palsy may be accomplished with an MRI head without and with contrast(CPT® 70553) and/or MRA brain without contrast

1. CT head without and with contrast (CPT® 70470) and/or CT orbit with contrast (CPT® 70481) can be approved if there is a clinical question of blood in the subarachnoid space.

C. If MRI contraindicated or cannot be performed, CT head without and with contrast (CPT® 70470), CT orbit with contrast (CPT® 70482) or CT orbit without and with contrast may be considered as substitutes

XVIII. Sinus Imaging in Adults

There is no evidence to support advanced imaging of acute (< 4 weeks) and subacute (4 to 12 weeks) uncomplicated rhinosinusitis.\(^40-41\) There is no evidence to support routine follow-up advanced imaging after treatment with clinical improvement of sinusitis.\(^40\) Advanced imaging may be considered in the following scenarios:

A. Orbital and/or Intracranial complications with ocular and/or neurological deficit\(^40,41,42\)

B. A new obstructing sinus mass, including retention cysts and nasal polyps, that obscures the physician’s view on endoscopy

C. Fungal Sinusitis

XIX. Ear Pain (Otalgia)\(^43-44\)

A. CT Temporal bone without and with contrast (CPT® 70482) or without contrast (CPT® 70480) and/or MRI Head without contrast (CPT® 70551) or without and with contrast (CPT® 70553) can be considered for:

1. Common causes of ear pain including ear infections, dental problems, sinus infection, neck problems, tonsillitis, and pharyngitis, as well as otitis media or otitis externa or no obvious cause, which do not improve with treatment over a reasonable time
2. Cerebellopontine angle or other intracranial tumor is suspected
3. Nervus intermedicus neuralgia in order to exclude a structural lesion
XX. Dental/Periodontal/Maxillofacial Imaging (All requests will be forwarded to Medical Director for review)
   A. Cone beam CT may be supported for surgical planning when plain x-rays alone are insufficient. Potential indications include but are not limited to
      1. Impacted teeth
      2. Supernumary teeth
      3. Dentoalveolar trauma
      4. Root resorption
      5. Foreign body
      6. Odontogenic cysts, tumors, or other jaw pathology
      7. Cleft pathology
      8. Osteomyelitis and odontogenic infections (MRI is the preferred modality after x-ray
      9. Bisphosphonate-related osteonecrosis of the jaw
     10. Salivary gland stones
     11. Maxillofacial bone graft planning
     12. Dental implants related to tooth loss from injury, trauma, or jaw pathology such as cysts, tumors, or cancer
   B. Some payers do not include orthodontic clinical conditions such as replacement of teeth lost due to caries or periodontal disease, non-trauma related dental implantology, or endodontic treatment not related to trauma to the natural tooth in their coverage policies
      1. Thus, Cone beam CT scans in these patients would also not be included in the coverage policy
      2. These coverage policies will take precedence over eviCore’s guidelines
   C. Cone Beam CT: Report with CPT® Codes: CPT® 70486, CPT® 70487, CPT® 70488, CPT® 70480, CPT® 70482
   D. 3-D rendering (CPT® 76376 or CPT® 76377) should NOT be reported separately
   E. Cone beam CT (CBCT) may also be called i-CAT scanner or mini-CAT scanner
References:

34. UpToDate, Approach to the patient with anisocoria, Literature review current through: Feb 2014. | This topic last updated: Jan 9, 2014. (normal pupil difference is <= 4mm).
36. UpToDate, Optic Neuritis, Pathophysiology, clinical features and diagnosis, Literature review current through: Feb 2014. | This topic last updated: Jan 5, 2014.

70480, 70481, 70482 CT Orbit, Sella, Posterior Fossa, Outer, Middle or Inner Ear
### I. Acute complicated rhinosinusitis with headache or facial pain or swelling or orbital pain or purulent nasal discharge\(^1-7\) and one of the following

A. Findings [One of the following]
   1. Orbital cellulitis (may include but not limited to swelling of the eye, proptosis, difficulty moving the eye)
   2. Facial cellulitis
   3. Suspicion of intracranial infection or meningitis
      a. Mental status changes
      b. Focal neurologic findings
   4. Proptosis
   5. Visual disturbance
   6. Focal neurologic findings

B. Comorbidities such as one of the following
   1. Diabetes
   2. Immunocompromised state
   3. Past history of facial trauma or surgery

C. One time repeat imaging may be approved if\(^19-22\) (One of the following)
   1. An ENT specialist requests the imaging AND there is no improvement after an additional 4 weeks of conservative treatment after initial imaging was completed AND there has been a follow-up visit since the previous imaging
   2. If there is a new abnormality on exam such as obstructing mass

D. Progression of symptoms under medical management

### II. Recurrent acute rhinosinusitis with 4 or more episodes of acute bacterial rhinosinusitis without signs or symptoms of rhinosinusitis between episodes within 1 year\(^1,3,4\) and one of the following:

A. Symptoms
   1. Upper respiratory symptoms for more than a week
   2. Colored nasal discharge
   3. Poor response to decongestant
   4. Facial or sinus pain
   5. Nasal obstruction
III. Chronic rhinosinusitis\textsuperscript{3,4,7} – symptoms lasting 12 weeks or longer of varying intensity and not responding to antibiotics taken for at least 7 days and one of the following (Both A and B)

A. Symptoms [Two or more of the following]
   1. Mucopurulent drainage
   2. Facial pain/pressure
   3. Nasal obstruction
   4. Decreased sense of smell

AND

B. Signs
   1. Purulent mucous or edema in the middle meatus or anterior ethmoid region
   2. Polyps in nasal cavity or the middle meatus
   3. Septal deviation

IV. Suspected sinus or nasopharyngeal tumor\textsuperscript{8-11} [One of the following]

This may include but is not limited to the following:

- Inverting papilloma
- Olfactory neuroblastoma (esthesioneuroblastoma)
- Juvenile angiofibroma
- Squamous cell carcinoma
- Adenocarcinoma
- Adenoid cystic carcinoma
- Odontogenic keratocyst

A. Positive nasal endoscopy
B. Clinical findings [One of the following]
   1. Nasal obstruction
   2. Posterior (Level V) neck mass
   3. Epistaxis
   4. Headache
   5. Serous otitis media with hearing loss, and otalgia
   6. Cranial nerve involvement (is indicative of skull base extension and advanced disease)
   7. Facial or dental pain without obvious cause
   8. Destroyed bone by x-ray

C. Anosmia or dysosmia >2 weeks
D. Recurrent unilateral otitis media or recurrent sinusitis after appropriate antibiotic therapy
E. Epstein-Barr virus (EBV) infection with positive titers
F. Documented history of inverting papilloma
V. Salivary gland pathology\textsuperscript{11,12} (MRI for all indications except stones) (For proven cancer of the salivary gland, see VII below) [One of the following]
A. Mass suspected by physical examination or US and MRI cannot be performed
B. Suspected submandibular or parotid duct stone and non diagnostic ultrasound [One of the following]
   1. Acutely swollen and painful gland
   2. Recurrent infections
   3. Indeterminate calcifications on x-ray
C. Follow up of known salivary gland tumor
   1. See VII below

VI. Mucocele or nasal polyp(s)\textsuperscript{5,10} (For cancer of the nose, see VII below) [One of the following]
A. Mucocele suspected physical findings [One of the following]
   1. Proptosis
   2. Exophthalmos
   3. Loss of vision
   4. Swelling over the sinus
B. Follow-up of known mucocele or polyp(s)
C. Nasal polyps [One of the following]
   1. Anterior rhinoscopy demonstrating polyp(s)
   2. History of cystic fibrosis
   3. Inability to smell (anosmia)
   4. Nasal obstruction

VII. Head and neck cancer
MRI should be used for staging of oropharyngeal tumors and to evaluate extension to skull base, orbit, cervical spine, or neurovascular structures.
A. CT Maxillofacial region may be obtained for suspected involvement of one of the following:
   1. Nasal cavity
   2. Paranasal sinuses
   3. Nasopharyngeal cancer
   4. Suspected bony erosion, skull base or intracranial involvement
B. Suspected or known malignancy with new signs or symptoms related to the maxillofacial region
C. Surveillance of known nasopharyngeal cancer – once within 6 months of completing all treatment and annually for 3 years
VIII. Trauma [One of the following]
   A. Facial subcutaneous air after injury
   B. CSF rhinorrhea (clear fluid drainage from nose)
   C. Diplopia
   D. X-ray evidence or suspicion of orbital floor fracture
   E. Suspcion of maxillary fracture
   F. Mandibular fracture suspected

IX. Cough, work up of chronic and a chest x-ray demonstrating no cause for the cough or treatment of the findings on the chest x-ray failed to relieve the cough\textsuperscript{13,14} (cough lasting more than 3 weeks and all of the following)
   A. [Skip section if there is no history of smoking or ACE inhibitor use]
      1. Patient smoked, no response to cessation
      2. Patient used ACE inhibitors, no response to discontinued use
   B. No response to empiric treatment of [All of the following]
      1. Upper airway cough syndrome (UACS preferred terminology; old terminology was post nasal drip) no response to >1 week of first generation antihistamines and decongestants
      2. GERD [One of the following]
         a. No response to anti-reflux medication
         b. Negative 24 hour esophageal pH monitoring
      3. Asthma, no response to bronchodilators

X. Pituitary\textsuperscript{15-18}
   A. Bitemporal hemianopsia is the classic finding
   B. Endocrine laboratory studies should be performed prior to considering advanced imaging including Prolactin levels; thyroid function levels should also be checked to evaluate for untreated or inadequately treated hypothyroidism as a cause of hyperprolactinemia and pituitary hyperplasia.
   C. Pituitary imaging is primarily performed with MRI head without or without and with contrast (CPT\textsuperscript{®} 70551 or CPT\textsuperscript{®} 70553):
      1. MRI Orbit, Face, Neck (CPT\textsuperscript{®} 70543) or Head CT without and with contrast (CPT\textsuperscript{®} 70470) are alternatives
      2. CT Head without contrast (CPT\textsuperscript{®} 70450) or without and with contrast (CPT\textsuperscript{®} 70470) and/or CT maxillofacial without contrast (CPT\textsuperscript{®} 70486) is occasionally used in addition to MRI to visualize perisellar bony structures in the preoperative evaluation of certain sellar tumors and for preoperative planning for transphenoidal approaches

PITUITARY IMAGING (Continued next page.)
### MICROADENOMA (<10 mm)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Initial Imaging</th>
<th>Repeat Imaging for Non-Operative Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microadenoma:</strong> Nonfunctioning, unexplained pituitary asymmetries, and incidentally found small tumors (&lt;10 mm)</td>
<td>MRI head without contrast and with contrast (CPT® 70553)</td>
<td>MRI head without contrast and with contrast (CPT® 70553) at: -6 and 12 months, then yearly for 3 years if stable. After 3 years, then every other year for the next 6 years, then every 5 years if stable</td>
</tr>
<tr>
<td><strong>Prolactinomas</strong>*</td>
<td>MRI head without and with contrast (CPT® 70553) with: -Unexplained elevated prolactin level above normal reference range or -Galactorrhea (in nonlactating) and normal prolactin levels persisting for &gt;6 months</td>
<td>MRI head without and with contrast (CPT® 70553) only if: -Hormonal levels rise or visual or neurological findings appear</td>
</tr>
<tr>
<td><strong>TSH, FSH, ACTH and LH producing</strong></td>
<td>MRI head without and with contrast (CPT® 70553) when hormone levels are inappropriately elevated</td>
<td></td>
</tr>
<tr>
<td><strong>Male Hypogonadism</strong></td>
<td>MRI head without and with contrast (CPT® 70553) if severe secondary hypogonadism (morning serum testosterone level &lt;150 ng/dl and low or normal LH and FSH levels); or Serum, free, or bioavailable morning testosterone level below normal range and low or normal LH and FSH levels accompanied by one of the following: Panhypopituitarism, hyperprolactinemia, symptoms or signs of tumor mass effect (e.g. headache, visual impairment, or visual field deficit), *****suspected alterations in sex hormone binding globulin (SHBG)</td>
<td></td>
</tr>
<tr>
<td><strong>Panhypopituitarism</strong></td>
<td>MRI head without and with contrast (CPT® 70553)</td>
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</tr>
</tbody>
</table>
**ADH ABNORMALITIES**

<table>
<thead>
<tr>
<th>Indication</th>
<th>Initial Imaging</th>
<th>Repeat Imaging for Non-Operative Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diabetes Insipidus (DI)</strong></td>
<td>MRI head without and with contrast (CPT® 70553) if:</td>
<td>NA</td>
</tr>
<tr>
<td>- Laboratory testing consistent with DI and etiology uncertain</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Syndrome of Inappropriate ADH (SIADH)</strong></td>
<td>MRI head without and with contrast (CPT® 70553) if:</td>
<td>NA</td>
</tr>
<tr>
<td>- Etiology remains uncertain or is thought to be in the nervous system,</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Macroadenoma (&gt;10 mm)(if not surgically removed and normal hormonal testing)</strong></td>
<td>MRI head without and with contrast (CPT® 70553)</td>
<td>MRI head <strong>without and with contrast</strong> (CPT® 70553) every:</td>
</tr>
<tr>
<td></td>
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<td>-6 months for the first year; and then,</td>
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<tr>
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<td></td>
<td>-annually for 5 years (longer if craniopharyngiomas);</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-every 6 months if treatment is deferred</td>
</tr>
<tr>
<td><strong>Other Pituitary Region Tumors</strong></td>
<td>Evaluation may require CT in addition to MRI to evaluate for hyperostosis. Requests will be sent for Medical Director review.</td>
<td></td>
</tr>
<tr>
<td><strong>Enlarged/Empty Sella Turcica</strong>*</td>
<td>Head CT without and with contrast (CPT® 70470) or, MRI head without and with contrast (CPT® 70553) to exclude residual pituitary tumor and to assess the position of the chiasm since herniation into the sella, causes Chiasmatic-type visual loss</td>
<td>MRI without and with contrast (CPT® 70553) -1-5 years after the initial study can be performed.</td>
</tr>
</tbody>
</table>

Post-operatively, follow-up pituitary imaging is generally done at the discretion of the neurosurgeon, usually at 3 months if stable

**XI. Dental/Periodontal/Maxillofacial Imaging (All requests will be forwarded to Medical Director for review).**

A. Cone beam CT may be supported for surgical planning when plain x-rays alone are insufficient. Potential indications include but are not limited to

1. Impacted teeth
2. Supernumary teeth
3. Dentoalveolar trauma
4. Root resorption
5. Foreign body
6. Odontogenic cysts, tumors, or other jaw pathology
7. Cleft pathology
8. Osteomyelitis and odontogenic infections (MRI is the preferred modality after x-ray)
9. Bisphosphonate-related osteonecrosis of the jaw
10. Salivary gland stones
11. Maxillofacial bone graft planning
12. Dental implants related to tooth loss from injury, trauma, or jaw pathology such as cysts, tumors, or cancer.

B. Some payers do not include orthodontic clinical conditions such as replacement of teeth lost due to caries or periodontal disease, non-trauma related dental implantology, or endodontic treatment not related to trauma to the natural tooth in their coverage policies.

1. Thus, Cone beam CT scans in these patients would also not be included in the coverage policy.

2. These coverage policies will take precedence over eviCore’s guidelines.

C. Cone Beam CT: Report with CPT® Codes: CPT® 70486, CPT® 70487, CPT® 70488, CPT® 70480, CPT® 70482

D. 3-D rendering (CPT® 76376 or CPT® 76377) should NOT be reported separately.

E. Cone beam CT (CBCT) may also be called i-CAT scanner or mini-CAT scanner.

References:


I. **Salivary gland pathology**\(^1,2\) [One of the following]
   A. Mass suspected
   B. Suspected Salivary gland stone [Follow-up of known salivary gland tumor]

II. **Parathyroid pathology**\(^3-5\) (Nuclear parathyroid scan) [One of the following]
   A. Hyperparathyroidism [Both of the following]
      1. Elevated Ca
      2. Elevated PTH
   B. Biopsy proven malignancy
      1. Initial staging

III. **Neck mass other than thyroid**\(^6-10\) [One of the following]
   A. Solitary lateral or posterior neck mass in the adult
   B. Multiple lateral or posterior neck masses in the adult
   C. US is the initial study in Anterior or tender lateral/posterior neck masses that have been observed for 2 weeks
   D. Personal history of cancer with a new neck mass
   E. Children: any mass detected by physical examination or other imaging not diagnostic (including but not limited to possible thyroglossal duct cyst, branchial cleft cyst, dermoid cyst, AVM, hemangioma)
   F. Fine needle aspiration consistent with metastatic disease (carcinoma, sarcoma) or lymphoma
   G. Suspected congenital neck mass [One of the following]
      1. Thyroglossal duct cyst with a non-diagnostic ultrasound
      2. Brachial cleft cyst
      3. Lymphangioma
      4. Thymic cyst
   H. Neck abscess

IV. **Suspected nasopharyngeal tumor**\(^11-14\) (For known cancers, see V below) [One of the following]
   A. Symptoms [One of the following]
      1. Epistaxis
      2. Recurrent sinusitis after appropriate antibiotic therapy
   B. Clinical findings [One of the following]
      1. Nasal obstruction
      2. Positive endoscopy
3. Serous otitis media with hearing loss and otalgia
4. Epstein-Barr virus (EBV) infection with positive titers
5. Posterior (level V) neck node or mass
6. Cranial nerve involvement (is indicative of skull base involvement and advanced disease)

V. Head and neck cancer\textsuperscript{11-15} [One of the following]
Includes but not limited to:
- Cancer of the arytenoid cartilage
- Cancer of the epiglottis
- Cancer of the hard palate
- Cancer of the hypopharynx
- Cancer of the infraglottic region
- Cancer of the lip
- Cancer of the glottic larynx
- Cancer of the nasopharynx
- Cancer of the oral cavity
- Cancer of the oropharynx
- Cancer of the paranasal sinuses including ethmoid, maxillary
- Cancer of the pharynx
- Cancer of the salivary gland(s)
- Cancer of the soft palate
- Cancer of the supraglottic larynx
- Cancer of the tongue
- Cancer of the tonsils
- Cancer of the vocal cord(s)
- Mucosal melanoma

*Thyroid and parathyroid cancers do not fall into this category.

A. Cervical lymph node biopsy consistent with head and neck malignancy but no known primary
B. Initial staging of new diagnosis of head and neck cancer confirmed by biopsy (For initial staging, CT as well as PET/CT may be needed)
C. Deteriorating clinical condition with known head and neck cancer such as but not limited to new neck mass including new nodes, new hoarseness, weight loss, bleeding, dysphagia
D. New evidence of cranial nerve involvement
E. Uncomplicated Pharyngitis or Tonsillitis should undergo conservative therapy including antibiotics, if appropriate. Advanced imaging is not indicated.

VI. Neck abscess
VII. Airway compromise by neck mass with evidence of upper airway obstruction and either a known neck mass or an enlarged thyroid

VIII. Recurrent Laryngeal Palsy/Hoarseness – The following can be considered with unilateral vocal cord/fold palsy identified by laryngoscopy:

A. MRI head without and with contrast (CPT® 70553) and/or MRI neck without and with contrast (CPT® 70543); or
B. MRI head without contrast (CPT® 70551) and/or MRI neck without contrast (CPT® 70540); or
C. If MRI is not available, CT head without and with contrast (CPT® 70470) and/or CT neck with contrast (CPT® 70491)
   1. Chest CT with contrast (CPT® 71260) may be added with left vocal cord palsy

IX. Thyroid Nodule

A. CT Neck with contrast (CPT®70491) or CT Neck without contrast (CPT®70490), or MRI Neck without and with contrast (CPT® 70543). MRI and CT are not indicated for routine thyroid nodule evaluation and should only be considered for:
   1. Evaluation of size/substantial extension of a nodular goiter (AACE)
   2. Airway compression (AACE)
   3. Presence of pathologic lymph nodes in cervical regions not visualized on ultrasound (AACE)
   4. In selected cases for nodules with aggressive features for more accurate pre-operative staging (AACE)
   5. Clinically suspected advanced disease, including invasive primary tumor (ATA)
   6. Inconclusive US with suspected thyroid cancer
   7. Preoperative planning for any thyroid disease
   8. CT Chest with contrast (CPT® 71260) or without contrast (CPT® 71250) may be used with a CT neck study if:
      a. Substernal Goiter is confirmed upon initial neck ultrasound (CPT®76536) or radionuclide study, in order to evaluate the extent of disease and for pre-operative planning in symptomatic patients

X. Lymphoma

A. Initial staging for biopsy proven lymphoma – in addition to PET/CT
B. During treatment may monitor response to chemotherapy with PET/CT
C. Follow-up shortly after completion of therapy with PET/CT
D. Surveillance in asymptomatic individual with no known metastatic disease and no symptoms or signs of relapse with negative PET or PET/CT after completion of treatment
   1. Hodgkin’s disease
a. Asymptomatic with no signs or symptoms of disease
   i. If the neck was involved with disease every 6-12 months for the first 2 years
2. Follicular, MALT, nodal marginal cell, mantle cell lymphoma, Burkitt’s lymphoma
   a. Asymptomatic with no signs or symptoms of disease
      i. Every 6 months for 2 years
      ii. Annually after 2 years
3. Diffuse large B-cell lymphoma, peripheral T-cell lymphoma as clinically indicated
E. 24 months after completion of treatment CLL and SLL (small lymphocytic lymphoma)
   1. CT before initiation of therapy when there is pathologically proven diagnosis of CLL or SLL

XI. Horner’s syndrome

XII. Dysphagia
     A. Esophagram (Barium swallow) evaluation is considered the initial study in the evaluation of dysphagia. These results can then lead to further evaluation with:
        1. Endoscopy is usually performed next
        2. Neck CT with contrast (CPT® 70491) and/or chest CT with contrast (CPT® 71260) and/or abdominal CT with contrast (CPT® 74160) (if requested)
        3. Chest MRI without contrast, or chest MRI without and with contrast (CPT® 71552), can be performed if vascular ring is suspected

XIII. Cervical Lymphadenopathy
     A. Neck CT with contrast (CPT® 70491) can be considered if:
        1. Determining an association of an identified lesion(s) with underlying structures;
        2. Determining the full extent of identified lesions;
        3. Identifying other pathologic lymph nodes

References:

32. Yeh MW, Bauer AJ, Bernet VA, Ferris RL. American Thyroid Association Statement on Preoperative Imaging for Thyroid Cancer Surgery. Thyroid, 2015; 25:3-14

70490, 70491, 70492 CT Soft Tissue Neck
70496 CTA of the Head

I. Subarachnoid hemorrhage (SAH)\textsuperscript{1-4} [One of the following]
   A. Subarachnoid hemorrhage by CT or lumbar puncture
   B. Proven subarachnoid hemorrhage with negative angiogram requiring follow-up imaging

II. Proven intracerebral bleed\textsuperscript{1,5} (hemorrhage or hematoma)
   A. CT or MRI positive for intracerebral bleed or hemorrhage or hematoma

III. Recent stroke by history\textsuperscript{1,6}

IV. Cerebral aneurysm\textsuperscript{1,4-14, 28-36}
   A. Screening study for cerebral aneurysm [One of the following]
      1. Screening for High Risk Populations as defined by the following criteria (screening usually begins at age 20 unless unusual circumstances as aneurysms are uncommon in children and adolescents):
      2. Positive Family History: Two or more first degree relatives with history of cerebral aneurysm or SAH: screening every 5 years beginning at age 20.
      3. Optional: One first degree relative with history of cerebral aneurysm or SAH may be candidates for screening based on higher incidence, but risks and benefits of screening, aneurysm detection, and treatments should be discussed with patient.
      4. Autosomal dominant polycystic kidney disease
      5. Aortic coarctation or bicuspid aortic valve
      6. Type 4 (Vascular) Ehlers-Danlos Syndrome
      7. Marfan’s Syndrome
      8. Loey-Dietz Syndrome
      9. Microcephalic osteodysplastic primordial dwarfism
   B. Patients with previous history of SAH or treatment for cerebral aneurysm: continued surveillance and screening every 5 years
   C. Known cerebral aneurysm documented by CTA, MRA or angiography [One of the following]
      1. Follow-up after intervention (embolization or surgery) CTA (CPT\textsuperscript{®} 70496) or head MRA (CPT\textsuperscript{®} 70544 or CPT\textsuperscript{®} 70546)
         a. Coiling or clipping or no treatment after subarachnoid bleed:
            i. 3, 6, 12, 18 and 24 months following treatment
            ii. If stable and occluded at last imaging, follow-up surveillance imaging may be performed every 5 years
            iii. If not stable at 2 years follow-up, then image annually until stable
         b. Known incidentally discovered aneurysms which have never bled:
            i. 6 months and then annually until determined to be stable
            ii. Every 5 to 10 years after stable
      2. New or worsening clinical findings [One of the following]
         a. Motor weakness affecting a limb, or one side of the face or body
         b. Decreased sensation affecting a limb, or one side of the face or body
c. Acute ataxia (unsteady and clumsy motion of the limbs or trunk)
d. Confusion including memory loss and disorientation
e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
g. Dysarthria (speech disorder resulting from neurological injury)
h. Dysphagia with no GI cause
i. Vertigo with either headache or nystagmus
j. Numbness, tingling, paresthesias
k. Decreased level of consciousness
l. Papilledema
m. Stiff neck
n. New onset of severe headache
o. Drowsiness
p. New onset of vomiting
q. Nystagmus
r. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure
v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication

D. Neurofibromatosis
E. Visual field loss
F. Thunderclap headache
G. Exertional headache
H. Preoperative planning for cerebral aneurysm management (surgical or interventional)
I. Third nerve palsy with pupillary involvement (pupil sparring third nerve palsies are not caused by external compression)
J. Suspicion of aneurysm bleed (CT Head or MRI Brain or CSF exam showing evidence of SAH)
K. Abnormal Head CT or MRI Brain suggesting possible aneurysm

V. Pre-operative study, carotid endarterectomy planned\(^1\) [One of the following]
A. Asymptomatic patient with carotid stenosis of 70% or more by carotid duplex US
B. Symptomatic carotid stenosis with carotid duplex US showing 70% stenosis or
C. Carotid duplex US showing ulcerated plaque
VI. **Abrupt onset of a neurologic deficit – including stroke and TIA**¹,⁶
   [One of the following]
   A. Motor weakness affecting a limb, or one side of the face or body
   B. Decreased sensation affecting a limb, or one side of the face or body
   C. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   D. Confusion including memory loss and disorientation
   E. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   F. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   G. Dysarthria (speech disorder resulting from neurological injury)
   H. Dysphagia with no GI cause
   I. Vertigo with either headache or nystagmus
   J. Numbness, tingling, paresthesias
   K. Decreased level of consciousness
   L. Papilledema
   M. Stiff neck
   N. New onset of severe headache
   O. Drowsiness
   P. New onset of vomiting
   Q. Nystagmus
   R. Cranial nerve palsy
   S. Gait disturbance
   T. Personality or behavioral changes
   U. New seizure
   V. Hearing loss or new onset tinnitus
   W. Agitation
   X. Somnolence
   Y. Slow response to verbal communication
   Z. Sudden falls
   AA. Balance problems

VII. **AVM (arteriovenous malformation)**¹⁵ [One of the following]
   A. Known AVM documented by CTA, MRA, MRI, catheter angiogram [One of the following]
      1. Immediate follow-up after a therapeutic procedure (i.e., surgery, embolization, radiosurgery)
      2. Routine follow up after a therapeutic procedure
      3. New or worsening clinical findings
         a. Motor weakness affecting a limb, or one side of the face or body
         b. Decreased sensation affecting a limb, or one side of the face or body
         c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
         d. Confusion including memory loss and disorientation
         e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
         f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
g. Dysarthria (speech disorder resulting from neurological injury)

h. Dysphagia with no GI cause

i. Vertigo with either headache or nystagmus

j. Numbness, tingling, paresthesias

k. Decreased level of consciousness

l. Papilledema

m. Stiff neck

n. New onset of severe headache

o. Drowsiness

p. New onset of vomiting

q. Nystagmus

r. Cranial nerve palsy

s. Gait disturbance

t. Personality or behavioral changes

u. New seizure

v. Hearing loss or new onset tinnitus

w. Agitation

x. Somnolence

y. Slow response to verbal communication

z. Sudden falls

aa. Balance problems

4. Planning of intervention (surgical or interventional)

B. Suspected AVM [One of the following]

1. Severe unexplained headache (thunderclap headache)

2. Altered level of consciousness

3. Focal neurologic findings

   a. Motor weakness affecting a limb, or one side of the face or body

   b. Decreased sensation affecting a limb, or one side of the face or body

   c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)

   d. Confusion including memory loss and disorientation

   e. Impaired vision, including amaurosis fugax, visual field loss and diplopia

   f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)

   g. Dysarthria (speech disorder resulting from neurological injury)

   h. Dysphagia with no GI cause

   i. Vertigo with either headache or nystagmus

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   m. Stiff neck

   n. New onset of severe headache

   o. Drowsiness

   p. New onset of vomiting

   q. Nystagmus
VI. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure
v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems

4. Subarachnoid hemorrhage on recent CT or MRI of the brain
5. Subarachnoid hemorrhage on lumbar puncture
6. Intracerebral bleed or hematoma, or hemorrhage on prior CT or MRI of the brain

VIII. Suspected cerebral venous thrombosis\textsuperscript{16-21} (MRA, MRI) [Both symptoms and risk factors]
A. Symptoms [One of the following]
   1. Papilledema
   2. Headaches
   3. Mental status changes
   4. Vomiting
   5. Changes in vision
   6. Seizures
   7. Lethargy or coma
   8. Alternating focal neurological deficits
   9. Hemiparesis or paraparesis
B. Risk factors [One of the following]
   1. Postpartum
   2. Post-operative status
   3. Skull fracture over dural sinus
   4. Calvarial mass
   5. Meningitis, sinusitis or middle ear infections
   6. Hypercoagulable state [One of the following]
      a. Personal history of cancer
      b. Factor V Leiden mutation
      c. MTHFR
      d. SLE
      e. Sickle cell disease
      f. Contraceptive medications
      g. Protein C deficiency
      h. Protein S deficiency
      i. Antiphospholipid antibodies
      j. Elevated lipoprotein (a)
      k. Elevated platelet count
      l. Prothrombin 20210 gene mutation
      m. Antithrombin III deficiency
n. Other medications
7. Ear, sinus, face, mouth or neck infection
8. Brain tumor by history

IX. Evaluation of pulsatile tinnitus

X. Vasculitis including temporal arteritis [Both of the following A and B or C]
A. Clinical presentation [One of the following]
   1. Headache
   2. Seizures
   3. Focal neurologic deficit
   4. Altered level of consciousness
   5. Altered mood or personality
   6. Autoimmune disease such as but not limited to [One of the following]
      a. Systemic lupus erythematosus (SLE)
      b. Polyarteritis nodosa
      c. Sjögren’s syndrome
      d. Behçet’s syndrome
      e. Dermatomyositis
B. Laboratory tests [One of the following]
   1. ESR >55 mm/hr
   2. C-reactive protein >10 mg/L
   3. ANA positive
   4. Anticardiolipin antibodies positive
C. Large/Giant Cell Arteritis (MRA Head without and with contrast (CPT® 70546) and MRA Neck without or with contrast (CPT® 70549) or CTA

XI. Hemifacial Spasm
A. MRI brain without and with contrast (CPT® 70553), CTA Head (CPT® 70496),
or MRA Head (CPT® 70544) prior to a vascular decompression surgical
procedure to clarify the vascular anatomy in patients who have failed
conservative medical management.

XII. Unilateral headache with suspicion of carotid or vertebral
dissection or unilateral Horner’s syndrome (CTA or MRA or MRI) [One of the following]
A. Neck pain
B. Unilateral facial or orbital pain
C. Unilateral headaches
D. Horner’s syndrome, miosis and ptosis (contraction of the iris, drooping eyelid)
or
E. Transient ischemic attacks (TIA)
F. Minor neck trauma
G. Rapid onset of headache with strenuous exercise or Valsalva maneuver
H. Closed head injury
References:


31. Hunder, G, Classification of and approach to the vasculitides in adult, UpToDate, acquired April 2, 2014.

32. American College of Radiology (ACR), American Society of Neuroradiology (ASNR), Society of Neuroradiological Surgery (SNIS), Society for Pediatric Radiology (SPR). ACR-ASNR-SNIS-SPR practice guideline for the performance of pediatric and adult cervicocerebral magnetic resonance angiography (MRA). American College of Radiology (ACR); 2010


70498  CTA of the Carotid and Vertebral Arteries

I. Suspected carotid stenosis\textsuperscript{1-6} [One of the following]
   A. TIA or stroke (See II below)
   B. Findings on carotid duplex examination [One of the following]
      1. 70% stenosis/occlusion or more of the internal carotid artery
      2. Technically inadequate/equivocal carotid Doppler
   C. Change in nature of a carotid bruit on examination

II. Symptoms of TIA/Stroke or abrupt onset of a neurologic deficit –
    including stroke and TIA\textsuperscript{1,6} [One of the following]
   A. Motor weakness affecting a limb, or one side of the face or body
   B. Decreased sensation affecting a limb, or one side of the face or body
   C. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   D. Confusion including memory loss and disorientation
   E. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   F. Aphasia (loss or impairment of the ability to produce or comprehend language
      due to brain damage)
   G. Dysarthria (speech disorder resulting from neurological injury)
   H. Dysphagia with no GI cause
   I. Vertigo with either headache or nystagmus
   J. Numbness, tingling, paresthesias
   K. Decreased level of consciousness
   L. Papilledema
   M. Stiff neck
   N. New onset of severe headache
   O. Drowsiness
   P. New onset of vomiting
   Q. Nystagmus
   R. Cranial nerve palsy
   S. Gait disturbance
   T. Personality or behavioral changes
   U. New seizure
   V. Hearing loss or new onset tinnitus
   W. Agitation
   X. Somnolence
   Y. Slow response to verbal communication
   Z. Sudden falls
   AA. Balance problems
III. Surveillance of Asymptomatic Individuals with Carotid Artery Disease that have NOT had Carotid Surgery or Intervention

A. $\geq 70\%$ Carotid Stenosis
   1. Duplex ultrasound (CPT® 93880 bilateral or CPT® 93882 unilateral) or MRA Neck with contrast (CPT® 70548) or CTA Neck (CPT® 70498) can be performed at the following intervals:
      a. Annually for the first 3 years
         i. Every 2 years thereafter if stable.
         ii. If increased stenosis is seen on imaging, may image annually until stable for 3 years.

IV. Surveillance Imaging WITH History of Carotid Surgery or Intervention

A. $\geq 70\%$ Carotid Stenosis
   1. Duplex ultrasound (CPT® 93880 bilateral or CPT® 93882 unilateral) or MRA Neck with contrast (CPT® 70548) or CTA Neck (CPT® 70498) can be performed at the following intervals:
      a. At 1 month after procedure
      b. At 6 months after procedure
      c. Annually until stability has been established.

V. Surveillance Imaging with NO History of Vascular Surgery or Intervention

A. Surveillance imaging once a year for patients with fibromuscular dysplasia of the extracranial carotid arteries.

B. Surveillance of Vertebrobasilar Pathology
   1. Asymptomatic or unchanged symptoms and known vertebrobasilar disease or post-stenting interval determined by Vascular Specialist.

VI. Subclavian Steal Syndrome – Initial evaluation should include clinical findings satisfying the symptom complex and initial imaging with carotid duplex study (CPT® 93882) 6

A. Satisfying the symptom complex:
   1. Physical examination findings suggestive of subclavian stenosis include a discrepancy of $>15$ mmHg in blood pressure readings taken in both upper extremities, delayed or decreased amplified pulses in the affected side, and a bruit in the supraclavicular area on the affected side.
   2. Symptoms include vertebral basilar artery insufficiency, vertigo, limb paresis, and paresthesias when exercising the left arm. Bilateral cortical visual disturbances, ataxia, syncope, and dysarthria occur less frequently.
   3. Symptoms of cerebral ischemia may be produced by exercise of the affected arm.

B. Carotid duplex study (CPT® 93882) is the initial and definitive imaging study. Reversal of flow in the ipsilateral vertebral artery.

C. If the carotid duplex is not diagnostic for reversal of flow in the ipsilateral vertebral artery, then neurological symptoms should be evaluated according to the Head guidelines.
D. Neck and chest MRA (CPT® 70548 and CPT® 71555) or CTA (CPT® 70498 and CPT® 71275) can be performed for diagnosis in patients with symptoms of vertebrobasilar ischemia if the clinical exam and duplex study are positive, indeterminate, or as preoperative studies if they will substitute for invasive angiography.

VII. Suspected traumatic or spontaneous carotid or vertebral dissection or unilateral Horner’s syndrome [One of the following]6-12
A. Neck pain or
B. Unilateral facial or orbital pain or
C. Unilateral headaches or
D. Horner’s syndrome, miosis and ptosis (contraction of the iris, drooping eyelid) or
E. Transient ischemic attacks (TIA see II above) or
F. Cranial nerve palsy or
G. New onset of stroke or
H. Minor neck trauma
I. Closed head injury

VIII. Carotid body tumor13-15 [Both of the following]
A. Carotid ultrasound demonstrating a solid mass at the carotid bifurcation and
B. Preoperative surgical planning

IX. Pre-operative evaluation of neck tumor for vascular invasion16
A. CT or MRI of the neck demonstrating a mass close to the carotid artery
B. Pulsatile neck mass

X. Large/Giant Cell Arteritis17-18 (MRA Head without and with contrast (CPT® 70546) and MRA Neck without or with contrast (CPT® 70549) or CTA
References:


70498 CT of the Carotid and Vertebral Arteries
I. GENERAL Neck MRI
   A. MRI is used less frequently than Neck CT.
   B. Neck MRI without and with contrast (CPT® 70543) is appropriate if CT suggests the need for further imaging or if ultrasound or CT suggests any of the following:
      1. Neurogenic tumor (schwannoma, neurofibroma, glomus tumor, etc.)
      2. Vascular malformations
      3. Deep neck masses
      4. Angiofibromas

II. Neck Pain
   A. Neck pain is usually related to a specific process including pharyngitis, radiculopathy, adenopathy, mass, carotid dissection and torticollis, and therefore found elsewhere in these guidelines.¹
   B. For the evaluation of neck pain or other symptoms which may involve the cervical spine, including myelopathy and cervical radiculopathy.¹

   Neck Pain References

III. Dysphagia
   A. Mass suspected, either intrinsic or extrinsic, to the esophagus.
      1. Esophagram (Barium Swallow) evaluation is considered the initial study in the evaluation of dysphagia. These results can then lead to further evaluation with:
         a. Endoscopy, and/or¹
            i. Neck CT with contrast (CPT® 70491), and/or Chest CT with contrast (CPT® 71260), and/or Abdominal CT with contrast (CPT® 74160) (if requested).²
   B. Dysmotility suspected²
      1. Esophagram and Motility study
   C. Vascular Ring suspected¹
      1. Chest CT angiography with contrast can be used in the evaluation of suspected vascular ring.
      2. Chest MRI without contrast, or Chest MRI without and with contrast (CPT® 71550 or CPT® 71552), can be performed if vascular ring is suspected.
D. Globus Sensation

1. Findings typical of globus sensation (lump in the throat) need no advanced imaging and have a benign natural history.2,3,4

2. If the diagnosis is unclear or the clinician cannot adequately visualize the pharynx, after examination and laryngoscopy, the following imaging can be considered:
   a. Esophagram
   b. Endoscopy and/or
   c. X-ray pharynx dynamic and static imaging.2,3,4

3. Dysphagia, weight loss, odynophagia, throat pain and hoarseness
   a. Neck CT with contrast (CPT® 70491)4
      i. Current or previous upper aerodigestive or esophageal malignancy, or lymphoma
      ii. Previous neck, esophageal, or gastric surgery
      iii. Palpable neck abnormality

Dysphagia References


3. Alhilali.


IV. Esophagus

A. Neck, Chest and/or Abdomen CT all with contrast (CPT® 70491, CPT® 71260, and/or CPT® 74160) can be performed to evaluate any of the following:

1. GERD, sliding or paraesophageal hiatal hernias: preoperative planning, (Chest and/or Abdomen CT)1

2. Hiatal hernia surgery: for GI Specialist or surgeon treatment/pre-operative planning or signs/symptoms of a potential complication, (Chest and Abdomen CT)

3. Mallory Weiss tear: suspected after endoscopy, (Chest and Abdomen CT)

4. Esophageal cancer: biopsy proven

5. Esophageal perforation: suspected (Neck and/or Chest and/or Abdomen CT)
6. **Esophageal diverticulum**: Depending on location, any of the CT studies above can be used.

B. Neck and/or Chest CT or MRI (CPT® 70543 and/or CPT® 71552) AND endoscopic ultrasound (CPT® 76975) can be used for leiomyoma, depending on the location.

C. Suspected **foreign body** obstructing the esophagus should be evaluated with x-ray.
   1. If x-ray is negative, use contrast study such as esophagram.
   2. A location appropriate CT can be used for further evaluation.

D. Any type of **esophageal stricture** (radiation, peptic, lye, neoplastic, postoperative, drug-induced, Crohn’s disease, Schatzki’s ring, esophageal web) should be evaluated with esophagram (barium swallow) and endoscopy prior to CT.
   1. If esophagram findings are negative, use CT of appropriate location.¹

E. Esophageal motility study (CPT® 78258) can be considered for any of the following:
   1. Dysphagia associated with chest pain and difficulty swallowing both solids and liquids
   2. Gastroesophageal reflux

F. Gastroesophageal Reflux Study (CPT® 78262) can be considered for any of the following:
   1. Chronic heartburn
   2. Dysphagia
   3. Family history of Barrett’s esophagus or esophageal carcinoma

G. Gastric Mucosa Imaging (CPT® 78261)
   1. To evaluate Barrett’s esophagus when there is dyspepsia or esophagitis.

H. **Globus** (Pharyngeus, “Hystericus”) sensation, Lump in throat.

### V. **Salivary gland disorders**

A. **Xerostomia** (Dry Mouth)
   1. Salivary Gland Nuclear Imaging (one of CPT® 78230, CPT® 78231, or CPT® 78232) can be considered for any one of the following:
      a. Dry mouth and either:
         i. Sjögren’s syndrome
         ii. Sialadenitis
         iii. History of head or neck radiation therapy
         iv. History of cerebral palsy
         v. Parotid mass to allow preoperative diagnosis of Warthin’s tumor

B. Salivary Gland Stones:
   1. For suspected salivary duct or gland stone, CT of the neck without contrast (CPT® 70490) or CT of the neck without and with contrast (CPT® 70492) or CT of the maxillofacial area without and with contrast (usually CPT® 70488) or MRI Neck without and with contrast (CPT® 70543).
   2. Sialography (contrast dye injection) under fluoroscopy, may be performed to rule out a stone, with post sialography CT (CPT® 70486), or post sialography MRI (CPT® 70540).

C. **Parotid Mass**
1. Any one of the following can be approved:
   2. MRI Orbits/Face/Neck without and with contrast (CPT® 70543)
   3. CT Neck with contrast (CPT® 70491)
   4. CT Neck without contrast (CPT® 70490)
   5. In addition to one of the above:
      a. Salivary Gland Nuclear Imaging (CPT® 78230, CPT® 78231, or CPT® 78232) is indicated if salivary gland stone is suspected, CT of the maxillofacial area without and with contrast (usually CPT® 70488) or neck MRI without and with contrast (CPT® 70543) can be considered in place of neck CT.

Salivary Gland Disorder References

VI. Parathyroid pathology
A. Primary Hyperparathyroidism suspected
   1. Parathyroid Planar Imaging (CPT® 78070), Parathyroid Planar Imaging with SPECT (CPT® 78071), Parathyroid Planar Imaging with SPECT and CT (CPT® 78072) or Ultrasound (CPT® 76536) if either:
      a. Elevated serum calcium and elevated serum parathyroid hormone level.
      b. Serum calcium 1 mg/dL more over lab normal value
   2. CT or MRI neck without and with contrast (CPT® 70492 or CPT® 70543):
      a. Very high calcium (≥ 13) suggesting parathyroid carcinoma
      b. Preoperative localization (including 4D Neck CT without and with contrast (CPT® 70492 or 77293),
      c. Recurrent or persistent hyperparathyroidism following neck exploration (MRI preferred).
   3. Chest CT with contrast may be indicated in rare circumstances in the evaluation of ectopic mediastinal parathyroid adenomas.

Parathyroid Pathology References


**VII. Neck mass other than thyroid[One of the following]**

A. Ultrasound (CPT® 76536) is the initial study for:\(^1\)
   1. Anterior neck masses
   2. Lateral or posterior neck masses that are tender and have been observed for 2 weeks under physician care and reassessed (generally an acute, infectious, or inflammatory mass).
   3. Otherwise ill-defined masses, fullness or asymmetry

B. Neck CT with contrast (CPT® 70491) is supported for:\(^1\)
   1. Lateral or posterior neck masses that are non-tender and discrete in the adult (> age 18)
   2. History of malignancy that would be primary or metastatic to the neck
   3. Suspected peritonsillar, retropharyngeal or other head and neck abscesses
   4. If sarcoidosis is suspected the Neck CT with contrast (CPT® 70491) should be followed by biopsy.

C. Neck MRI without and with contrast (CPT® 70543) if:\(^1\)
   1. CT suggests the need for further imaging.
   2. Ultrasound or CT suggests neurogenic tumor (schwannoma, neurofibroma, glomus tumor, etc.), vascular malformations, deep neck masses and angiofibromas.

D. Uncomplicated Pharyngitis or Tonsillitis should undergo conservative therapy including antibiotics, if appropriate. Advanced imaging is not indicated.\(^2\)

**Neck Mass Other Than Thyroid References**


**VIII. Suspected orbital tumor or other pathology[One of the following]**

Orbital tumors include but are not limited to the following:

- Optic nerve glioma
• Orbital meningioma
• Hemangioma
• Lymphangioma
• Neurofibroma
• Sarcoma
• Melanoma
• Metastatic disease

A. Unilateral exophthalmos or enophthalmos or bulging of the eyeball
B. Orbital or periorbital mass or vascular malformation
C. Adult with sudden vision loss
D. Proptosis
E. Uveitis, scleritis and vision loss
F. Head injury with visual loss
G. Optic atrophy
H. Orbital cellulitis

I. Optic neuritis (gadolinium suggested) [One of the following]
   1. Vision loss in one eye with known MS
   2. Eye pain worsening with movement of the eye
   3. Visual field deficit which is mostly central
   4. Examination of the eye [One of the following]
      a. Swelling of the optic disc
      b. Blurring of disc margins
      c. Distended veins
   5. Loss of color vision

J. Proptosis in a child with orbital asymmetry and visual loss
K. Progressive visual loss in a child
L. Post-operative evaluation
M. Pre-operative evaluation
N. Papilledema
O. Orbital tumor [One of the following]
   1. Melanoma
   2. Retinoblastoma
   3. Lymphoma
   4. Hemangioma
   5. Optic nerve glioma
   6. Orbital meningioma
   7. Orbital sarcoma
   8. Metastases
P. Leukocoria
Q. Ophthalmoplegia (weakness of one or more of the muscles that control eye movement)

IX. Suspected nasopharyngeal tumor\textsuperscript{2-6} (For known cancer, see VI below) [One of the following]
A. Symptoms [One of the following]
   1. Epistaxis
2. Recurrent sinusitis after appropriate antibiotic therapy

B. Clinical findings [One of the following]
1. Nasal obstruction
2. Positive endoscopy
3. Serous otitis media with hearing loss and otalgia
4. Epstein-Barr virus (EBV) infection with positive titers
5. Posterior (level V) neck node or mass
6. Cranial nerve involvement (is indicative of skull base extension and advanced disease)

X. Head and neck cancer

Either CT of the neck with contrast (CPT® 70491) or MRI of the neck without and with contrast (CPT® 70543) may be obtained for one of the following
Includes but not limited to:
- Cancer of the arytenoid cartilage
- Cancer of the epiglottis
- Cancer of the hard palate
- Cancer of the infraglottic region
- Cancer of the larynx
- Cancer of the oral cavity
- Cancer of the paranasal sinuses
- Cancer of the pharynx
- Cancer of the salivary gland(s)
- Cancer of the soft palate
- Cancer of the supraglottic region
- Cancer of the tongue
- Cancer of the tonsils
- Cancer of the vocal cord(s)
- Mucosal melanoma

*Thyroid and parathyroid cancers do not fall into this category.

A. Cervical lymph node biopsy consistent with head and neck malignancy but no known primary
B. Initial staging of new diagnosis of head and neck cancer confirmed by biopsy
   (For initial staging, CT/MRI as well as PET/CT may be needed)
C. After completion of all treatment to establish a post-treatment baseline
D. Recurrence suspected based on one of the following: (either CT or MRI)
   1. Deteriorating clinical condition with known head and neck cancer
   2. New neck mass including new palpable adenopathy
   3. New hoarseness, weight loss, bleeding, dysphagia
   4. New evidence of cranial nerve involvement
   5. New biopsy proven recurrence
E. Surveillance:
   1. For all head/neck cancers, CT or MRI neck may be obtained once within 6 months of completion of all treatment
   2. CT or MRI neck may be repeated annually for 3 years for one of the following:
a. Nasopharyngeal primary site
b. Physical examination unable to evaluate the primary site for recurrence

XI. Thyroid Cancer

A. Initial staging for follicular, papillary, and Hurthle Cell Carcinomas for any one of the following (CT or MRI neck may be indicated):
   1. Fixation suggested by clinical exam and/or ultrasound
   2. Substernal or bulky disease
   3. Disease precluding full ultrasound examination

B. Restaging for any of the following (CT or MRI neck may be indicated):
   1. Recurrence documented by biopsy
   2. Increasing thyroglobulin level without Thyrogen® stimulation
   3. Thyroglobulin level > 2 ng/mL or higher than previous after Thyrogen® stimulation
   4. Anti-thyroglobulin antibody present
   5. Evidence of residual thyroid tissue on ultrasound or physical exam after thyroidectomy or ablation

XII. Suspected or known malignancy with new signs or symptoms related to the neck or for known involvement of the neck with cancer

XIII. Recurrent Laryngeal Palsy – The following can be considered with unilateral vocal cord/fold palsy identified by laryngoscopy:

A. MRI head without and with contrast (CPT® 70553); or MRI head without contrast (CPT® 70551)
B. MRI neck without and with contrast (CPT® 70543); or
   1. Chest CT with contrast (CPT® 71260) may be added with left vocal cord palsy

XIV. Brachial plexus

Brachial plexus studies can be coded either as upper extremity other than joint MRI without or without and with contrast (CPT® 73218 or CPT® 73220), Chest MRI without or without and with contrast (CPT® 71550 or CPT® 71552) or Neck MRI without (CPT® 70540) or without and with contrast (CPT® 70543) (if upper trunk) after EMG/NCV examination for:

A. Malignant infiltration (EMG not required)
B. Radiation plexitis to r/o malignant infiltration
C. Brachial plexitis (Parsonage-Turner Syndrome or painful brachial amyotrophy).
   1. Self-limited syndrome characterized by initial shoulder region pain followed by weakness of specific muscles in a pattern which does not conform to involvement of a single root or distal peripheral nerve
   2. Consider MRI of the cervical spine if radiculopathy.
D. Traumatic injury
E. Neurogenic Thoracic Outlet Syndrome (TOS) failed a 2 to 3 month trial of conservative management and are being considered for surgical treatment.

F. Preoperative study which requires evaluation of the brachial plexus

Brachial Plexus References


XV. Proptosis¹ (or exophthalmos)

A. Orbital asymmetry in a child with visual loss

B. Adult with painful visual loss

XVI. Thyroid ophthalmopathy or thyroid eye disease and history of Graves’ disease¹ (This may be seen in hyperthyroid, hypothyroid or euthyroid individuals)

XVII. Visual field deficit (MRI)

A. Bitemporal hemianopsia (loss of peripheral vision)

B. Homonymous hemianopsia (loss of vision in the nose half of one eye and the outer half of the other eye)

C. Scotoma (loss of central vision)

D. Heteronymous hemianopsia (loss of vision in either the nose half or the outer half of both eyes)

XVIII. Thyroid mass with an enlarged thyroid gland on a nuclear scan and ultrasound that is incomplete or cannot demonstrate complete substernal extension

XIX. Bell’s palsy⁷ [One of the following]

A. No improvement in facial paresis after 8 weeksIncomplete recovery after 3 months
B. Trauma to the temporal bone
C. Paralysis of isolated branches of the facial nerve
D. Second paralysis on the same side
E. Multiple cranial nerve deficits
F. Weakness or sensory loss in an extremity

XX. Hearing loss [One of the following]⁸
A. Suspected cholesteatoma with conductive hearing loss documented on an audiogram [One of the following]
   1. Acute and intermittent vertigo
   2. Painless otorrhea
   3. Purulent drainage from the ear or mastoid area
   4. Purulent drainage and granulation tissue in the ear
B. Conductive hearing loss documented on an audiogram
C. Total deafness and planning for possible cochlear implant
D. Fluctuating hearing loss
E. Glomus tumor and reddish blue mass in the ear
F. Sensorineural hearing loss on recent audiogram (MRI of the head without and with contrast)
G. Mixed conductive and sensorineural hearing loss on recent audiogram

XXI. Otalgia with a normal ear examination⁹

XXII. Vision loss¹
A. Acute sudden loss of vision
B. Proptosis and painful loss of vision
C. Uveitis, scleritis and vision loss
D. Ophthalmoplegia
E. Child with orbital asymmetry, proptosis and loss of vision
F. Child with slowly progressive loss of vision

XXIII. Optic neuritis¹⁰-¹³ [One of the following]
A. Eye pain worsening with movement of the eye
B. Visual field deficit which is mostly central (scotoma)
C. Visual loss in one eye with known MS
D. Examination of the eye [All of the following]
   1. Swelling of the optic disc and
   2. Blurring of disc margins and
   3. Distended veins
E. Suspicion of multiple sclerosis [One of the following]
   1. Pain on eye movement or tenderness of globe
   2. Impaired color perception
   3. Unilateral rapid visual loss
   4. Visual loss Improves spontaneously
F. Post radiation neuritis, visual loss months or years after radiation therapy to area

XXIV. Headache of the skull base, orbits or periorbital area¹⁴
XXV. Thyroid Nodule\textsuperscript{15-25}
A. Neck CT without contrast (CPT\textsuperscript{®} 70490) or Neck MRI without or with contrast (CPT\textsuperscript{®} 70543) after FNA has been performed for:
1. Known thyroid mass and cervical lymphadenopathy
2. Preoperative planning

XXVI. Sinusitis
A. Orbital and/or Intracranial complications with ocular and/or neurological deficit
   1. MRI Face, Orbit, and Neck without and with contrast (CPT\textsuperscript{®} 70543)
B. A new obstructing sinus mass, including retention cysts and nasal polyps, that obscures the physician’s view on endoscopy
   1. MRI Face, Orbit, and Neck without and with contrast (CPT\textsuperscript{®} 70543)
C. Fungal Sinusitis
   1. MRI Face, Orbit, and Neck without and with contrast (CPT\textsuperscript{®} 70543)

References:


25. Yeh MW, Bauer AJ, Bernet VA, Ferris RL. American Thyroid Association Statement on Preoperative Imaging for Thyroid Cancer Surgery. Thyroid, 2015; 25:3-14


70544 MRA or MRV of the Brain without Gadolinium
70545 MRA or MRV of the Brain with Gadolinium
70546 MRA or MRV of the Brain without and with Gadolinium

Head MRA (CPT® 70544) is generally done without contrast. MRA Neck may be done either without contrast, with contrast, or without and with contrast, depends on facility preference and protocols and type of scanner. CT and MR Venography (CTV and MRV) are reported with the same codes as the CTA/MRA counterpart. If arterial and venous CT or MR studies are both performed in the same session, only one CPT® code should be used to report both procedures. MRA with and without contrast with venous sinus thrombosis to differentiate total from subtotal occlusion.

I. **Subarachnoid hemorrhage (SAH)** 1-4
   A. Subarachnoid hemorrhage by CT or lumbar puncture
   B. Proven subarachnoid hemorrhage with negative angiogram requiring follow up imaging

II. **Proven intracerebral bleed** 1,5 (hemorrhage or hematoma)

III. **Recent stroke by history** 1,6

IV. **Cerebral aneurysm** 1,4-14, 28-36 [One of the following]
   A. Screening study for cerebral aneurysm [One of the following]
      1. Screening for High Risk Populations as defined by the following criteria (screening usually begins at age 20 unless unusual circumstances as aneurysms are uncommon in children and adolescents):
      2. Positive Family History: Two or more first degree relatives with history of cerebral aneurysm or SAH: screening every 5 years beginning at age 20.
      3. Optional: One first degree relative with history of cerebral aneurysm or SAH may be candidates for screening based on higher incidence, but risks and benefits of screening, aneurysm detection, and treatments should be discussed with patient.
      4. Autosomal dominant polycystic kidney disease
      5. Aortic coarctation or bicuspid aortic valve
      6. Type 4 (Vascular) Ehlers-Danlos Syndrome
      7. Marfan’s Syndrome
      8. Loeys-Dietz Syndrome
      9. Microcephalic osteodysplastic primordial dwarfism
   B. Patients with previous history of SAH or treatment for cerebral aneurysm: continued surveillance and screening every 5 years. Suspected cerebral aneurysm [One of the following]
      1. SAH or intracerebral hematoma on prior imaging
      2. Isolated cranial nerve (CN) deficit
C. Known cerebral aneurysm documented by CTA, MRA or angiography [One of the following]

1. Follow-up after intervention (embolization or surgery) CTA (CPT® 70496) or head MRA (CPT® 70544 or CPT® 70546)
   a. Coiling or clipping or no treatment after subarachnoid bleed:
      i. 3, 6, 12, 18 and 24 months following treatment
      ii. If stable and occluded at last imaging, follow-up surveillance imaging may be performed every 5 years
      iii. If not stable at 2 years follow-up, then image annually until stable

2. Known incidentally discovered aneurysms which have never bled:
   a. 6 months and then annually until determined to be stable
   b. Every 5 to 10 years after stable

3. New or worsening clinical findings [One of the following]
   a. Motor weakness affecting a limb, or one side of the face or body
   b. Decreased sensation affecting a limb, or one side of the face or body
   c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   d. Confusion including memory loss and disorientation
   e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   g. Dysarthria (speech disorder resulting from neurological injury)
   h. Dysphagia with no GI cause
   i. Vertigo with either headache or nystagmus
   j. Numbness, tingling, paresthesias
   k. Decreased level of consciousness
   l. Papilledema
   m. Stiff neck
   n. New onset of severe headache
   o. Drowsiness
   p. New onset of vomiting
   q. Nystagmus
   r. Cranial nerve palsy
   s. Gait disturbance
   t. Personality or behavioral changes
   u. New seizure
   v. Hearing loss or new onset tinnitus
   w. Agitation
   x. Somnolence
   y. Slow response to verbal communication
   z. Sudden falls
   aa. Balance problems

4. Interval evaluation for stability in an asymptomatic individual
   a. Aneurysm 5mm or less annually for up to 5 years and then every other year
b. Aneurysm more than 5mm every 6 months for up to 5 years and then annually
D. Neurofibromatosis
E. Visual field loss
F. Thunderclap headache
G. Exertional headache
H. Preoperative planning for cerebral aneurysm management (surgical or interventional)
I. Third nerve palsy with pupillary involvement (pupil sparring third nerve palsies are not caused by external compression)
J. Suspicion of aneurysm bleed (CT Head or MRI Brain or CSF exam showing evidence of SAH)
K. Abnormal Head CT or MRI Brain suggesting possible aneurysm

V. Preoperative study, carotid endarterectomy planned¹ [One of the following]
A. Asymptomatic patient with carotid stenosis of 70% or more by carotid duplex US
B. Symptomatic carotid stenosis with carotid duplex US showing 70% stenosis
C. Preoperative planning for other intracranial procedures

VI. Abrupt onset of a neurologic deficit – including stroke and TIA¹,⁶ [One of the following]
A. New or worsening clinical findings [One of the following]
   1. Motor weakness affecting a limb, or one side of the face or body
   2. Decreased sensation affecting a limb, or one side of the face or body
   3. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   4. Confusion including memory loss and disorientation
   5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   6. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   7. Dysarthria (speech disorder resulting from neurological injury)
   8. Dysphagia with no GI cause
   9. Vertigo with either headache or nystagmus
  10. Numbness, tingling, paresthesias
  11. Decreased level of consciousness
  12. Papilledema
  13. Stiff neck
  14. New onset of severe headache
  15. Drowsiness
  16. New onset of vomiting
  17. Nystagmus
  18. Cranial nerve palsy
  19. Gait disturbance
  20. Personality or behavioral changes
  21. New seizure
22. Hearing loss or new onset tinnitus
23. Agitation
24. Somnolence
25. Slow response to verbal communication
26. Sudden falls
27. Balance problems

VII. AVM (arteriovenous malformation)¹⁵ [One of the following]
A. Known AVM documented by CTA, MRA, MRI, catheter angiogram [One of the following]
   1. Immediate follow-up after a therapeutic procedure (i.e., surgery, embolization, radiosurgery)
   2. Routine follow up after a therapeutic procedure
   3. New or worsening clinical findings
   4. New or worsening clinical findings [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body
      c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      d. Confusion including memory loss and disorientation
      e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      g. Dysarthria (speech disorder resulting from neurological injury)
      h. Dysphagia with no GI cause
      i. Vertigo with either headache or nystagmus
      j. Numbness, tingling, paresthesias
      k. Decreased level of consciousness
      l. Papilledema
      m. Stiff neck
      n. New onset of severe headache
      o. Drowsiness
      p. New onset of vomiting
      q. Nystagmus
      r. Cranial nerve palsy
      s. Gait disturbance
      t. Personality or behavioral changes
      u. New seizure
      v. Hearing loss or new onset tinnitus
      w. Agitation
      x. Somnolence
      y. Slow response to verbal communication
      z. Sudden falls
      aa. Balance problems
   5. Planning of intervention (surgical or interventional)
B. Suspected AVM [One of the following]
C. Screening for:

D. Familial cavernoma: Screening should include MRI Head without or with and with contrast (with gradient echo images). One head CTA (CPT® 70496) or head MRA (CPT® 70544) can be performed for screening. If negative, no further screening studies are indicated
   1. Subarachnoid hemorrhage on recent CT or MRI of the brain
   2. Subarachnoid hemorrhage on lumbar puncture
   3. Intracerebral bleed or hematoma, or hemorrhage on prior CT or MRI of the brain

VIII. Suspected cerebral venous thrombosis with negative MRI of the brain

   [Both symptoms and risk factors]

   A. Symptoms [One of the following]
      1. Papilledema
      2. Headaches
      3. Mental status changes
      4. Vomiting
      5. Changes in vision
      6. Seizures
      7. Lethargy or coma
      8. Alternating focal neurological deficits
      9. Hemiparesis or paraparesis

   B. Risk factors [One of the following]
      1. Postpartum or
      2. Post-operative status
      3. Skull fracture over dural sinus
      4. Calvarial mass
      5. Meningitis, sinusitis or middle ear infections
      6. Hypercoagulable state [One of the following]
         a. Personal history of cancer
         b. Factor V Leiden mutation
         c. MTHFR
         d. SLE
         e. Sickle cell disease
         f. Contraceptive medications
         g. Protein C deficiency
         h. Protein S deficiency
         i. Antiphospholipid antibodies
         j. Elevated lipoprotein (a)
         k. Elevated platelet count
         l. Prothrombin 20210 gene mutation
         m. Antithrombin III deficiency
      7. Ear, sinus, face, mouth or neck infection
      8. Brain tumor by history

IX. Evaluation of pulsatile tinnitus or suspicion of vascular lesion
X. Vasculitis including temporal arteritis\textsuperscript{37-39} [Both of the following A and B] or C
A. Clinical presentation [One of the following]
   1. Headache
   2. Seizures
   3. Focal neurologic deficit
   4. Altered level of consciousness
   5. Altered mood or personality
   6. Autoimmune disease such as but not limited to [One of the following]
      a. Systemic lupus erythematosus (SLE)
      b. Polyarteritis nodosa
      c. Sjögren’s syndrome
      d. Behçet’s syndrome
      e. Dermatomyositis
B. Laboratory tests [One of the following]
   1. ESR >55 mm/hr
   2. C-reactive protein >10 mg/L
   3. ANA positive
   4. Anticardiolipin antibodies positive
C. Large/Giant Cell Arteritis\textsuperscript{57-59} (MRA Head without and with contrast (CPT 70546) and MRA Neck without or with contrast (CPT\textsuperscript{®} 70549) or CTA)

XI. Hemifacial Spasm
MRI brain without and with contrast (CPT\textsuperscript{®} 70553), CTA Head (CPT\textsuperscript{®} 70496), or MRA Head (CPT\textsuperscript{®} 70544) prior to a vascular decompression surgical procedure to clarify the vascular anatomy in patients who have failed conservative medical management.

XII. Unilateral headache with suspicion of carotid or vertebral dissection or unilateral Horner’s syndrome\textsuperscript{27} (CTA or MRA or MRI) [One of the following]
A. Neck pain
B. Unilateral facial or orbital pain
C. Unilateral headaches
D. Horner’s syndrome, miosis and ptosis (contraction of the iris, drooping eyelid) or
E. Transient ischemic attacks (TIA)
F. Sudden onset of headache
G. Minor neck trauma
H. Rapid onset of headache with strenuous exercise or Valsalva maneuver
I. Closed head injury

XIII. Trigeminal Neuralgia
A. Trigeminal neuralgia failed medical therapy

XIV. Onset of Headache with physical exertion
A. For onset of headache with Valsalva maneuver cough, physical exertion or sexual (post-coital) activity but not merely a worsening of a pre-existing headache with these activities, the following procedures may be considered:
1. MRA Head without contrast (CPT® 70544)

References:

9. Wiebers DO. Patients with small, asymptomatic, unruptured intracranial aneurysms and no history of subarachnoid hemorrhage should generally be treated conservatively, Stroke, 2005; 36:408-409
34. Hunder, G, Classification of and approach to the vasculitides in adult, UpToDate, acquired April 2, 2014.
35. American College of Radiology (ACR), American Society of Neuroradiology (ASNR), Society of NeuroInterventional Surgery (SNIS), Society for Pediatric Radiology (SPR). ACR-ASNR-SNIS-SPR practice guideline for the performance of pediatric and adult cervicocerebral magnetic resonance angiography (MRA). American College of Radiology (ACR); 2010

70544, 70545, 70546 MRA or MRV of the Brain
70547  MRA or MRV Carotid and Vertebral Arteries without Gadolinium
70548  MRA or MRV Carotid and Vertebral Arteries with Gadolinium
70549  MRA or MRV Carotid and Vertebral Arteries without and with Gadolinium

I. Suspected carotid stenosis\textsuperscript{1-6} [One of the following]
   A. TIA or stroke (See II below)
   B. Findings on carotid duplex examination [One of the following]
      1. 70% stenosis/occlusion or more of the internal carotid artery
      2. Carotid duplex US showing ulcerated plaque
      3. Technically inadequate/equivocal carotid Doppler
   C. Change in nature of a carotid bruit on examination

II. Symptoms of TIA/Stroke or abrupt onset of a neurologic deficit – including stroke and TIA\textsuperscript{1,6} [One of the following]
   A. Motor weakness affecting a limb, or one side of the face or body
   B. Decreased sensation affecting a limb, or one side of the face or body
   C. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   D. Confusion including memory loss and disorientation
   E. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   F. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   G. Dysarthria (speech disorder resulting from neurological injury)
   H. Dysphagia with no GI cause
   I. Vertigo with either headache or nystagmus
   J. Numbness, tingling, paresthesias
   K. Decreased level of consciousness
   L. Papilledema
   M. Stiff neck
   N. New onset of severe headache
   O. Drowsiness
   P. New onset of vomiting
   Q. Nystagmus
   R. Cranial nerve palsy
   S. Gait disturbance
   T. Personality or behavioral changes
   U. New seizure
   V. Hearing loss or new onset tinnitus
   W. Agitation
   X. Somnolence
   Y. Slow response to verbal communication
Z. Sudden falls  
AA. Balance problems  

III. Surveillance of Asymptomatic Individuals with Carotid Artery Disease that have NOT had Carotid Surgery or Intervention  
A. => 70% Carotid Stenosis  
1. Duplex ultrasound (CPT® 93880 bilateral or CPT® 93882 unilateral) or MRA Neck with contrast (CPT® 70548) or CTA Neck (CPT® 70498) can be performed at the following intervals:  
a. Annually for the first 3 years  
   i. Every 2 years thereafter if stable.  
   ii. If increased stenosis is seen on imaging, may image annually until stable for 3 years.  

IV. Surveillance Imaging WITH History of Carotid Surgery or Intervention  
A. => 70% Carotid Stenosis  
1. Duplex ultrasound (CPT® 93880 bilateral or CPT® 93882 unilateral) or MRA Neck with contrast (CPT® 70548) or CTA Neck (CPT® 70498) can be performed at the following intervals:  
a. At 1 month after procedure  
b. At 6 months after procedure  
c. Annually until stability has been established.  

V. Surveillance Imaging with NO History of Vascular Surgery or Intervention  
A. Surveillance imaging once a year for patients with fibromuscular dysplasia of the extracranial carotid arteries.  
B. Surveillance of Vertebrobasilar Pathology  
1. Asymptomatic or unchanged symptoms and known vertebrobasilar disease or post-stenting interval determined by Vascular Specialist.  

VI. Subclavian Steal Syndrome. Initial evaluation should include clinical findings satisfying the symptom complex and initial imaging with carotid duplex study (CPT® 93882)  
A. Satisfying the symptom complex:  
   1. Physical examination findings suggestive of subclavian stenosis include a discrepancy of >15 mmHg in blood pressure readings taken in both upper extremities, delayed or decreased amplified pulses in the affected side, and a bruit in the supraclavicular area on the affected side.  
   2. Symptoms include vertebral basilar artery insufficiency, vertigo, limb paresis, and paresthesias when exercising the left arm. Bilateral cortical visual disturbances, ataxia, syncope, and dysarthria occur less frequently.  
   3. Symptoms of cerebral ischemia may be produced by exercise of the affected arm.  
B. Carotid duplex study (CPT® 93882) is the initial and definitive imaging study. Reversal of flow in the ipsilateral vertebral artery.
C. If the carotid duplex is not diagnostic for reversal of flow in the ipsilateral vertebral artery, then neurological symptoms should be evaluated according to the Head guidelines.

D. Neck and chest MRA (CPT® 70548 and CPT® 71555) or CTA (CPT® 70498 and CPT® 71275) can be performed for diagnosis in patients with symptoms of vertebrobasilar ischemia if the clinical exam and duplex study are positive, indeterminate, or as preoperative studies if they will substitute for invasive angiography.

VII. Suspected traumatic or spontaneous carotid or vertebral dissection or unilateral Horner’s syndrome [One of the following]6-12
A. Neck pain
B. Unilateral facial or orbital pain
C. Unilateral headaches
D. Horner’s syndrome, miosis, and ptosis (contraction of the iris, drooping eyelid)
E. Transient ischemic attacks (TIA) (See II above)
F. Cranial nerve palsy
G. New onset of stroke
H. Minor neck trauma
I. Closed head injury

VIII. Carotid body tumor13-15 [Both of the following]
A. Carotid ultrasound demonstrating a solid mass at the carotid bifurcation and
B. Preoperative surgical planning

IX. Preoperative evaluation of neck tumor for vascular invasion
A. CT or MRI of the neck demonstrating a mass close to the carotid artery
B. Pulsatile neck mass

X. Large/Giant Cell Arteritis16-17 (MRA Head without and with contrast (CPT® 70546) and MRA Neck without or with contrast (CPT® 70549) or CTA
References:

70551 MRI of the Brain without Gadolinium

I. Abrupt onset of a neurologic deficit – including stroke and TIA\(^1-3\)  
[One of the following]

A. Motor weakness affecting a limb, or one side of the face or body
B. Decreased sensation affecting a limb, or one side of the face or body
C. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
D. Confusion including memory loss and disorientation
E. Impaired vision, including amaurosis fugax, visual field loss and diplopia
F. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
G. Dysarthria (speech disorder resulting from neurological injury)
H. Dysphagia with no GI cause
I. Vertigo with either headache or nystagmus
J. Numbness, tingling, paresthesias
K. Decreased level of consciousness
L. Papilledema
M. Stiff neck
N. New onset of severe headache
O. Drowsiness
P. New onset of vomiting
Q. Nystagmus
R. Cranial nerve palsy
S. Gait disturbance
T. Personality or behavioral changes
U. New seizure
V. Hearing loss or new onset tinnitus
W. Agitation
X. Somnolence
Y. Slow response to verbal communication
Z. Sudden falls
AA. Balance problems

II. Reevaluation after stroke [One of the following]

A. Deteriorating clinical status with new or worsening neurologic findings
   1. Motor weakness affecting a limb, or one side of the face or body
   2. Decreased sensation affecting a limb, or one side of the face or body
   3. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   4. Confusion including memory loss and disorientation
   5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   6. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   7. Dysarthria (speech disorder resulting from neurological injury)
   8. Dysphagia with no GI cause
9. Vertigo with either headache or nystagmus
10. Numbness, tingling, paresthesias
11. Decreased level of consciousness
12. Papilledema
13. Stiff neck
14. Drowsiness
15. New onset of vomiting
16. Nystagmus
17. Cranial nerve palsy
18. Gait disturbance
19. Personality or behavioral changes
20. New seizure
21. Hearing loss or new onset tinnitus
22. Agitation
23. Somnolence
24. Slow response to verbal communication
25. Sudden falls
26. Balance problems

B. Anti-coagulation planned

III. Headache (CT for D, J, K)\textsuperscript{1,4-9} [One of the following]
A. Papilledema
B. Worsened by Valsalva maneuver, coughing straining or postural changes
C. Wakens from sleep
D. Suspected subarachnoid hemorrhage (CT in early phase) [One of the following]
1. With sudden onset of severe, exertional, or “thunderclap” headache
2. Associated with nausea, vomiting, diplopia, seizure, mental status change
3. History of prior known (documented on CTA, MRA or angiogram) aneurysm or AVM
E. Infection in an extracranial location
F. Change in mental status, personality, or level of consciousness
G. Suspected carotid or vertebral artery dissection or unilateral Horner’s syndrome (CTA or MRA or MRI) [One of the following]
1. Neck pain
2. Unilateral facial or orbital pain
3. Unilateral headaches
4. Horner’s syndrome, miosis and ptosis (contraction of the iris, drooping eyelid)
5. Transient ischemic attacks (TIA) (See I above)
6. Minor neck trauma
7. Rapid onset of headache with strenuous exercise or Valsalva maneuver
H. Head pain that spreads into the lower neck and between the shoulders (May indicate meningeal irritation due to either infection or subarachnoid blood; it is not typical of a benign process)
I. Suspected subdural hematoma [One of the following]
1. Major head trauma
2. Minor trauma while on anticoagulants
J. Thunderclap headache (CT)
K. Worst headache of life (CT)
L. New headache [One of the following]
   1. Abnormal neurologic examination [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body
      c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      d. Confusion including memory loss and disorientation
      e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      g. Dysarthria (speech disorder resulting from neurological injury)
      h. Dysphagia with no GI cause
      i. Vertigo with either headache or nystagmus
      j. Numbness, tingling, paresthesias
      k. Decreased level of consciousness
      l. Papilledema
      m. Stiff neck
      n. Drowsiness
      o. New onset of vomiting
      p. Nystagmus
      q. Cranial nerve palsy
      r. Gait disturbance
      s. Personality or behavioral changes
      t. New seizure
      u. Hearing loss or new onset tinnitus
      v. Agitation
      w. Somnolence
      x. Slow response to verbal communication
      y. Sudden falls
      z. Balance problems

2. Aural temperature >38.3°C or >100.9°F
3. Stiff neck (nuchal rigidity)
4. History of HIV infection
5. History of TB
6. History of sarcoidosis
7. Age 5 years or less
8. Over age 50
9. Pregnancy
10. Headache with exertion
11. Mental status changes
12. Extracranial malignancy

M. Chronic daily headache –
1. New neurologic deficit (see L1 above) (MRI without and with contrast)
2. Imaging is not medically necessary if there is a normal neurologic examination and no new features of the headache

N. Known neurofibromatosis
O. Rapidly increasing frequency of headache
P. Personal history of cancer (MRI without and with contrast)

IV. Head trauma\textsuperscript{10-13} (CT for first 24 hours) [One of the following]

A. Patients who meet criteria for imaging under modified Canadian Criteria:
   1. Taking one anticoagulant or two anti-aggregants. (e.g., aspirin and Plavix)
   2. Known platelet or clotting disorder
   3. Renal failure (creatinine>6)
   4. Glasgow coma scale (GCS) score of less than 15 at 2 hours following injury
   5. >30 minutes of amnesia
   6. Any "dangerous mechanism of injury" (fall greater than 5 steps downstairs or from height greater than 3 feet; any pedestrian motor vehicle accident or ejection from motor vehicle)
   7. Suspected open skull fracture
   8. Signs of basilar skull fracture
   9. Two or more episodes of vomiting
   10. Patient >64 years old

B. Mild or moderate acute closed head injury under age 2
C. Minor or acute closed head injury with focal neurologic deficit
D. Subacute or chronic closed head trauma with cognitive and/or neurologic deficit (MRI without contrast)
E. Suspected carotid or vertebral dissection (CTA or MRA head and neck (See CPT codes 70498 or 70547, 70548, 70549)
F. Penetrating injury, stable neurologically intact (CT)
G. Focal neurologic finding
   1. Motor weakness affecting a limb, or one side of the face or body
   2. Decreased sensation affecting a limb, or one side of the face or body
   3. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   4. Confusion including memory loss and disorientation
   5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   6. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   7. Dysarthria (speech disorder resulting from neurological injury)
   8. Dysphagia with no GI cause
   9. Vertigo with either headache or nystagmus
   10. Numbness, tingling, paresthesias
   11. Decreased level of consciousness
   12. Papilledema
   13. Stiff neck
   14. Drowsiness
   15. New onset of vomiting
16. Nystagmus
17. Cranial nerve palsy
18. Gait disturbance
19. Personality or behavioral changes
20. New seizure
21. Hearing loss or new onset tinnitus
22. Agitation
23. Somnolence
24. Slow response to verbal communication
25. Sudden falls
26. Balance problems

H. Drug or alcohol intoxication
I. Skull fracture

V. Suspected or known AVM (arteriovenous malformation) [One of the following]
   A. Known AVM (documented by CTA, MRA, MRI, or catheter angiogram) [One of the following]
      1. Immediate follow-up after a therapeutic procedure (i.e., surgery, embolization, radiosurgery)
      2. New or worsening clinical findings [One of the following]
         a. Motor weakness affecting a limb, or one side of the face or body
         b. Decreased sensation affecting a limb, or one side of the face or body
         c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
         d. Confusion including memory loss and disorientation
         e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
         f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
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         n. New onset of severe headache
         o. Drowsiness
         p. New onset of vomiting
         q. Nystagmus
         r. Cranial nerve palsy
         s. Gait disturbance
         t. Personality or behavioral changes
         u. New seizure
         v. Hearing loss or new onset tinnitus
         w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
   aa. Balance problems
3. Planning of intervention (surgical or interventional)

B. Suspected AVM [One of the following]
   1. Severe unexplained headache (thunderclap headache)
   2. Altered level of consciousness
   3. Focal neurologic findings [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body
      c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      d. Confusion including memory loss and disorientation
      e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      g. Dysarthria (speech disorder resulting from neurological injury)
      h. Dysphagia with no GI cause
      i. Vertigo with either headache or nystagmus
      j. Numbness, tingling, paresthesias
      k. Decreased level of consciousness
      l. Papilledema
      m. Stiff neck
      n. New onset of severe headache
      o. Drowsiness
      p. New onset of vomiting
      q. Nystagmus
      r. Cranial nerve palsy
      s. Gait disturbance
      t. Personality or behavioral changes
      u. New seizure
      v. Hearing loss or new onset tinnitus
      w. Agitation
      x. Somnolence
      y. Slow response to verbal communication
      z. Sudden falls
         aa. Balance problems
4. Subarachnoid hemorrhage on recent CT or MRI of the brain
5. Subarachnoid hemorrhage on lumbar puncture
6. Intracerebral bleed or hematoma, or hemorrhage on prior CT or MRI of the brain

C. Screening for:
2. Familial cavernoma: Screening should include MRI Head without or with contrast (with gradient echo images).

VI. Demyelinating disease\textsuperscript{14-19} (includes both suspected or known MS) [One of the following]
A. Multiple sclerosis [One of the following]
   1. Clinical findings or symptoms [One of the following]
      a. Difficulty walking
      b. Ataxia
      c. Numbness
      d. Bladder dysfunction
      e. Optic neuritis
      f. Weakness face, arms or legs
      g. Difficulty with balance
      h. Vertigo
      i. Hearing loss
      j. Constipation
      k. Memory loss
      l. Lhermitte’s sign
      m. Double vision
      n. Blurred vision
      o. Painful movement of the eye
      p. Nystagmus
      q. Impaired coordination
      r. Dysarthria
      s. Dysphagia
      t. Neuropathic pain including trigeminal neuralgia or extremity pain
   2. Follow-up to assess treatment
      a. Baseline, in 3-6 months, and then annually when instituting or maintaining immune-modulating agents and when changing therapy
      b. Symptoms suggestive of Progressive Multifocal Leukoencephalopathy during Tysabri therapy. Screening with MRI Brain every 6 months if JC virus positive on Tysabri or other treatments known to increase risk of PML.

VII. Chronic or progressive mental status changes\textsuperscript{20}
A. Deteriorating cognitive function [One of the following]
   1. Progressive loss of memory
   2. Confusion
   3. Disorientation
   4. Personality changes

VIII. Hydrocephalus\textsuperscript{20-24} [One of the following]
A. Suspected obstructive hydrocephalus [1 and 2]
   1. Clinical findings [One of the following]
      a. Headache
      b. Papilledema
c. Diplopia

d. Mental status changes

e. Gait disturbance or ataxia (People with ataxia experience a failure of muscle control in their arms and legs, resulting in a lack of balance and coordination or a disturbance of gait)

f. Seizure and

2. History of [One of the following]

a. Arteriovenous malformation (AVM)

b. Aneurysm

c. Intraventricular or SAH

d. Meningitis

e. Known hydrocephalus

B. Normal pressure hydrocephalus (NPH) [One of the following]

1. Gait disturbance (shuffling, magnetic. wide based, disequilibrium and slow gait)

2. Motor perseverance (tremors)

3. Urinary incontinence, urgency, or frequency

4. Dementia

5. Known NPH with worsening symptoms

C. Suspicion of VP (ventriculoperitoneal) shunt malfunction

D. Known hydrocephalus in a child

1. 0-6 months if screening head ultrasound demonstrates hydrocephalus

2. Age 0-5 yrs annually

3. Age 5 or older every 2 years

4. Annually for children post shunting

IX. Chiari Malformation

A. For Chiari malformation, MRI head contrast (CPT® 70551) is appropriate

B. Once Chiari malformation has been identified, there may be a need to:

1. Exclude syrinx

   a. MRI cervical spine without and with contrast (CPT® 72156) and MRI thoracic spine without and with contrast (CPT® 72157)

2. Follow-up hydro/syringomyelia

   a. MRI spine studies without and with contrast (is superior to spine CT)

   b. Annual imaging until non-progression of the syringomyelia is established

   c. Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established

   d. Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration

   e. Head or neck MRA and CTA are not needed in the evaluation of syringomyelia unless ordered by the operating surgeon for preoperative planning.

3. Evaluate for hydrocephalus with CSF flow studies. There is no unique CPT® code to report a CSF flow study; it is performed as a sequence during a MRI head without contrast (CPT® 70551). No separate code should be assigned
4. Repeat MRI head without contrast (CPT® 70551) is not needed unless there are increasing symptoms or signs, or it is to be used as a preoperative study.
5. Perform an MRI lumbar spine if there is concern for other associated congenital abnormalities such as tethered cord.
C. Chiari malformation is not itself familial and family screening of asymptomatic individuals is not appropriate.

X. **Dandy-Walker cyst**\(^{27}\)

XI. **Encephalocele**\(^{27}\)

XII. **Microcephaly**
- Online calculator to determine head circumference percentile is available at: [http://www.infantchart.com/cdc0to3headforage.php](http://www.infantchart.com/cdc0to3headforage.php)
- Head circumference less than the 5th percentile for age and sex, established by use of measurements and CDC growth charts.

XIII. **Macrocephaly**
- Head circumference greater than the 95th percentile for age and sex, established by use of measurements and CDC growth charts.
  1. Birth to age 12 months: Ultrasound of the head (CPT\(^{(R)}\) 76506) is indicated initially in patients with an open fontanelle.

XIV. **Developmental delay**\(^{28}\)

XV. **Multiple congenital anomalies**\(^{27}\)

XVI. **Seizures**\(^{29-32}\) [One of the following]
- Refractory seizures in a candidate for surgery
- New onset of seizures
- New onset of seizure unrelated to trauma older than age 40 (MRI without and with contrast preferred)
- New onset of seizures with focal neurologic deficit
- New onset of seizures older than 18 following acute trauma
- New-onset seizure older than 18 post subacute or chronic trauma (MRI without contrast)
- Suspicion of migration anomalies or other morphologic brain abnormalities in children
- Suspicion of cortical dysplasia
- Refractory or drug resistant seizures
  1. Follow-up studies after a previous routine normal study may be considered if performed with special "Epilepsy Protocol" (typically 3T magnet, thin sections with angled slices through hippocampus and temporal lobes)
XVII. Follow up subdural hematoma, epidural, subarachnoid or intracerebral (parenchymal) hemorrhage\textsuperscript{1,33,34} [One of the following]
   A. New neurologic findings [One of the following]
      1. Motor weakness affecting a limb, or one side of the face or body
      2. Decreased sensation affecting a limb, or one side of the face or body
      3. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
      4. Confusion including memory loss and disorientation
      5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
      6. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
      7. Dysarthria (speech disorder resulting from neurological injury)
      8. Dysphagia with no GI cause
      9. Vertigo with either headache or nystagmus
      10. Numbness, tingling, paresthesias
      11. Decreased level of consciousness
      12. Papilledema
      13. Stiff neck
      14. New onset of severe headache
      15. Drowsiness
      16. New onset of vomiting
      17. Nystagmus
      18. Cranial nerve palsy
      19. Gait disturbance
      20. Personality or behavioral changes
      21. New seizure
      22. Hearing loss or new onset tinnitus
      23. Agitation
      24. Somnolence
      25. Slow response to verbal communication
      26. Sudden falls
      27. Balance problems
   B. New onset headache or changing headache
   C. Follow-up within 36 hours of initial presentation if not performed previously
   D. Interval follow-up with or without change in signs or symptoms
   E. Follow up of known subarachnoid hemorrhage with negative angiogram

XVIII. Suspected intracranial hemorrhage\textsuperscript{33,34} [One of the following]
   A. Head trauma [One of the following]
      1. Amnesia
      2. Altered level of consciousness or loss of consciousness
      3. Vomiting
      4. Neurologic symptoms
      5. Seizure
6. Coagulopathy previously diagnosed (or current treatment with heparin or Coumadin®)
7. Skull fracture
8. Ataxia
9. Aphasia
10. Decreased sensation in a limb
11. Visual field loss
12. Double vision
13. Memory loss

B. Suspicion of acute subarachnoid hemorrhage [One of the following]
1. Vomiting
2. Sudden onset of severe hypertension
3. Decreased level of consciousness
4. Thunderclap headache
5. Worst headache of one’s life
6. Headache and known aneurysm
7. Headache and first degree relative with aneurysm
8. Treated aneurysm and/or AVM with new headache or findings on neurologic examination
9. Stiff neck
10. Seizure
11. Third nerve palsy

C. Intracerebral (parenchymal) hemorrhage [One of the following]
1. Hypertension with new onset headache
2. Known brain metastases with change in neurologic status
3. New onset of neurologic symptoms [One of the following]
   a. Motor weakness affecting a limb, or one side of the face or body
   b. Decreased sensation affecting a limb, or one side of the face or body
   c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   d. Confusion including memory loss and disorientation
   e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   g. Dysarthria (speech disorder resulting from neurological injury)
   h. Dysphagia with no GI cause
   i. Vertigo with either headache or nystagmus
   j. Numbness, tingling, paresthesias
   k. Decreased level of consciousness
   l. Papilledema
   m. Stiff neck
   n. New onset of severe headache
   o. Drowsiness
   p. New onset of vomiting
   q. Nystagmus
r. Cranial nerve palsy  
s. Gait disturbance  
t. Personality or behavioral changes  
u. New seizure  
v. Hearing loss or new onset tinnitus  
w. Agitation  
x. Somnolence  
y. Slow response to verbal communication  
z. Sudden falls  
aa. Balance problems

XIX. **Movement Disorders**
   A. MRI of the Brain without, or without and with contrast (CPT® 70551 or CPT® 70553) is considered in the following clinical scenarios:
      1. Atypical Parkinsonism because of unusual clinical features (for example, persistent unilateral signs and symptoms, young onset under age of 50, rapid progression), incomplete or uncertain medication responsiveness, or clinical diagnostic uncertainty. These cases should be forwarded for medical director review  
      2. Suspected Huntington Disease  

XX. **Dementia**\(^72\) [**One of the following**]
   A. Imaging is considered after an initial diagnosis of dementia is established based on history and exam findings, including a mental status exam. MRI head without contrast (CPT® 70551) or MRI Head without and with contrast (CPT® 70553) is considered after an initial clinical diagnosis of dementia\(^80,81\) has been established based on a detailed history of memory loss with impairment of day-to-day activities confirmed by family members or others with knowledge of the patient’s status and/or abnormal bedside mental status testing such as Mini-Mental Status Exam (MMSE), Montreal Cognitive Assessment Survey (MOCA), and the St. Louis University Mental Status (SLUMS). Neuropsychological testing can be performed when history and bedside mental status examination cannot provide a confident diagnosis.\(^78,79\)
   B. Frontotemporal dementia  
   C. Vascular dementia  
   D. Alzheimer’s disease  
   E. Dementia with Lewy bodies  
   F. Prion disease (Creutzfeldt-Jakob)

XXI. **Suspicion of neuroectodermal dysplasia**

XXII. **Suspected cerebral venous thrombosis**\(^35-40\) [**Both A and B**]
   A. Symptoms [**One of the following**]
      1. Papilledema  
      2. Headaches  
      3. Mental status changes
4. Vomiting
5. Changes in vision
6. Seizures
7. Lethargy or coma
8. Alternating focal neurological deficits
9. Hemiparesis or paraparesis

B. Risk factors [One of the following]
1. Postpartum
2. Post-operative status
3. Skull fracture over dural sinus
4. Calvarial mass
5. Meningitis, sinusitis or middle ear infections
6. Hypercoagulable state [One of the following]
   a. Personal history of cancer
   b. Factor V Leiden mutation
   c. MTHFR
   d. SLE
   e. Sickle cell disease
   f. Contraceptive medications
   g. Protein C deficiency
   h. Protein S deficiency
   i. Antiphospholipid antibodies
   j. Elevated lipoprotein (a)
   k. Elevated platelet count
   l. Prothrombin 20210 gene mutation
   m. Antithrombin III deficiency
   n. Other medications
7. Ear, sinus, face, mouth or neck infection
8. Brain tumor by history

XXIII. Congenital sensorineural hearing loss

XXIV. Recurrent Laryngeal Palsy – The following can be considered with unilateral vocal cord/fold palsy identified by laryngoscopy:

   A. MRI head without and with contrast (CPT® 70553) and/or MRI neck without and with contrast (CPT® 70543); or
   B. MRI head without contrast (CPT® 70551) and/or MRI neck without contrast (CPT® 70540); or
   C. IF MRI is not available, CT head without and with contrast (CPT® 70470) and/or CT neck with contrast (CPT® 70491)
      1. Chest CT with contrast (CPT® 71260) may be added with left vocal cord palsy
XXV. Follow-up imaging: MRI cervical spine without contrast (CPT® 72141) and MRI brain without contrast (CPT® 70551) and/or MRI thoracic spine without contrast (CPT® 72146) when involved A. If there is a concern for malignancy, imaging can be performed with and without contrast B. Annual imaging until non-progression of the syringomyelia is established C. Following surgical treatment (including posterior fossa decompression) D. Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established E. Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration F. Repeat advanced diagnostic imaging in spinal cord injury patients with post-traumatic syrinx is not appropriate without evidence of neurological deterioration

XXVI. Pediatric Epilepsy and other seizure disorders - A recent (within 60 days) face-to-face evaluation including a detailed history, physical examination with a thorough neurologic examination, and appropriate laboratory studies should be performed prior to considering advanced imaging, unless the patient is undergoing guideline-supported scheduled follow-up imaging evaluation. This clinical evaluation should also include family history and (whenever possible) the accounts of eyewitnesses to the event(s).

A. Initial Imaging of Non-Febrile seizures

1. MRI brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
   a. First-time seizure in child ≥12 months of age that has no known cause and is not associated with fever
   b. Inconclusive findings on recent cranial ultrasound or CT Head
   c. Partial seizures
   d. Focal neurologic deficits
   e. Patients requiring sedation should generally not have noncontrast MRI studies. See Pediatric Head Imaging Modality General Considerations (noted below)

2. CT Head without contrast (CPT® 70450) is indicated for the following:
   a. First-time seizure in child associated with recent head trauma
   b. Patient cannot safely undergo MRI (avoidance of sedation is not an indication)

3. Cranial ultrasound (CPT® 76506) is indicated for the following:
   a. First-time seizure in child in child <12 months of age that has no known cause and is not associated with fever

4. The following imaging tests do not generally add valuable information initially and are not indicated for the initial evaluation of seizures in children:
a. CTA Head or Neck  
b. MRA Head or Neck  
c. MRI Cervical, Thoracic, Lumbar Spine

B. Repeat imaging on indication
1. Repeat MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
   a. New or worsening focal neurologic deficits  
   b. Increase in severity or frequency of seizures despite documented therapeutic antiepileptic drug levels  
   c. Change in seizure type  
   d. Preoperative evaluation for epilepsy surgery  
   e. Patients requiring sedation should generally not have noncontrast MRI studies. See Pediatric Head Imaging Modality General Considerations (noted below).

C. Evaluation for Epilepsy Surgery
1. These cases should be forwarded for medical review  
2. PET Brain Metabolic (CPT® 78608)  
3. Functional MRI Brain (CPT® 70554 or 70555)  
4. MR Spectroscopy (CPT® 76390)  
   a. NOTE: Certain payers consider MR Spectroscopy investigational/experimental, and those coverage policies take precedence over eviCore Imaging Guidelines.

D. Febrile Seizures
1. Neuroimaging should not be performed in the routine evaluation of children with simple febrile seizures

XXVII. Pediatric Head Imaging Modality General Considerations

A. MRI
1. MRI is the preferred modality for imaging the pediatric head unless otherwise stated in a specific guideline section  
2. Due to the length of time for image acquisition and the need for stillness, anesthesia is required for almost all infants and young children (age <7 years), as well as older children with delays in development or maturity. In this patient population, MRI imaging sessions should be planned with a goal of avoiding a short-interval repeat anesthesia exposure due to insufficient information using the following considerations:
   a. MRI should always be performed without and with contrast unless there is a specific contraindication to gadolinium use, since the patient already has intravenous access for anesthesia  
   i. The U.S. Food and Drug Administration (FDA) has noted that there is currently no evidence to suggest that gadolinium retention in the brain is harmful and restricting gadolinium-based contrast agents (GBCAs) use is not warranted at this time. It has been recommended that GBCA use should be limited to circumstances in which additional information provided by the contrast agent is necessary and the necessity of repetitive MRIs with GBCAs should be assessed.
ii. If requesting clinicians indicate that a non-contrast study is being requested with specific concern for gadolinium retention, the exam can be approved.

b. If multiple body areas are supported by MSI guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same anesthesia session

B. CT
1. CT is generally inferior to MRI for imaging the pediatric head, but has specific indications in which it is the preferred modality listed in specific sections of these guidelines
   a. CT should not be used to replace MRI in an attempt to avoid sedation unless listed as a recommended study in a specific guideline section

C. Ultrasound
1. Cranial ultrasound (CPT® 76506) is a non-invasive means of evaluating for intracranial abnormalities in infants with an open anterior fontanelle
2. Transcranial Doppler ultrasonography has some utility in select populations of older children with known or suspected intracranial vascular disease

D. Nuclear Medicine
1. Nuclear medicine studies other than metabolic PET imaging on the pediatric brain or head are rarely performed in an elective outpatient setting, but the following studies can be approved when requested for the following indications:
   a. Brain Scintigraphy with or without vascular flow (any one of CPT® 78600 CPT® 78601, CPT® 78605, or CPT® 78606)
      i. Establish brain death (rarely done in outpatient setting)
   b. Brain Imaging SPECT Technetium-99m or thallium-201 (CPT® 78607)
      i. Immunocompromised patients with mass lesion detected on CT or MRI for differentiation between lymphoma and infection
      ii. In distinguishing recurrent brain tumor from radiation necrosis
   c. Brain Imaging Vascular Flow (CPT® 78610)
      i. Cerebral ischemia
      ii. Establish brain death
   d. CSF Leakage Detection (CPT® 78650)
      i. Evaluation of CSF rhinorrhea or otorrhea, or refractory post-lumbar puncture headache
   e. Suspected normal pressure hydrocephalus with gait disturbance and either dementia or urinary incontinence
   f. Radiopharmaceutical Dacryocystography (CPT® 78660)
      i. Suspected obstruction of nasolacrimal duct due to excessive tearing
g. Imaging SPECT with Ioflupane I-23 (CPT® 78607) can be approved for differentiation of Parkinsonian syndrome (PS) and non-neurodegenerative disorders, such as essential tremor (ET) or drug-induced tremor, due to the overlap of clinical symptoms. DAT-SPECT has significant impact on clinical diagnosis and management of diagnostic uncertainty in cases of PS.

XXVIII. Ear Pain (Otalgia)

A. MRI Brain without (CPT® 70551) can be considered for:
   1. Common causes of ear pain including ear infections, dental problems, sinus infection, neck problems, tonsillitis, and pharyngitis, as well as otitis media or otitis externa or no obvious cause, which do not improve with treatment over a reasonable time
   2. Cerebellopontine angle or other intracranial tumor is suspected
   3. Nervus intermedius neuralgia in order to exclude a structural lesion

XXIX. Sinusitis

A. Orbital and/or Intracranial complications with ocular and/or neurological deficit
   1. MRI head without contrast (CPT® 70551)
B. A new obstructing sinus mass, including retention cysts and nasal polyps, that obscures the physician’s view on endoscopy
   1. MRI head without contrast (CPT® 70551)
C. Fungal Sinusitis
   1. MRI Head without contrast (CPT® 70551)

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70551 MRI of the Brain without Gadolinium
70552 MRI Brain with Gadolinium
70553 MRI Brain without and with Gadolinium

I. Suspected pseudotumor cerebri or benign idiopathic intracranial hypertension\textsuperscript{1-2}
   A. Clinical finding
      1. Symptoms or findings on exam [One of the following]
         a. Headache
         b. Visual disturbances or complete loss of vision, which may be transient
         c. Flashing lights
         d. Diplopia
         e. Loss of vision
         f. Blurred vision
         g. Level of consciousness may be impaired
         h. Nausea and/or vomiting
         i. Tinnitus (pulsatile) or ringing in the ears
         j. Papilledema
         k. Enlargement blind spots
         l. Abducens palsy (inability to deviate the eye laterally)
      m. Repeat imaging may be considered to evaluate either:
         i. Shunt dysfunction in those patients who have had ventriculoperitoneal (VP) or lumboperitoneal (LP) shunts
         ii. Clinical deterioration

II. Seizure\textsuperscript{3-6} [One of the following]
   A. Refractory or drug resistant seizures
   B. Surgical candidate or preop planning
   C. New onset of seizures
   D. New-onset seizure unrelated to trauma age 18 to 40 (MRI without contrast)
   E. New onset of seizure unrelated to trauma older than age 40 (MRI without and with contrast)
   F. New onset of seizure with a focal neurologic deficit not related to trauma
   G. New onset of seizures older than 18 following acute trauma (CT)
   H. New onset seizure older than 18 post subacute or chronic trauma
   I. Suspected neuroectodermal dysplasia
   J. Suspicion of migration anomalies or other morphologic brain abnormalities in children
   K. Suspicion of cortical dysplasia
   L. Partial seizures
   M. Follow-up studies after a previous routine normal study may be considered if performed with special “Epilepsy Protocol” (typically 3T magnet, thin sections with angled slices through hippocampus and temporal lobes).
   N. Repeat MRI Brain without contrast (CPT\textsuperscript{70551}) or without and with contrast (CPT\textsuperscript{70553}) is indicated for the following:
1. New or worsening focal neurologic deficits
2. Increase in severity or frequency of seizures despite documented therapeutic antiepileptic drug levels
3. Change in seizure type
4. Preoperative evaluation for epilepsy surgery

O. Initial Imaging of Non-Febrile Seizures: 
(A typical febrile seizure is a generalized seizure occurring in the presence of fever (T ≥ 100.4°F) and no central nervous system infection in a child between the age of 6 months and 5 years)
1. Neuroimaging should not be performed in the routine evaluation of children with simple febrile seizures
2. MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
   a. First-time seizure in child ≥ 12 months of age that has no known cause and is not associated with fever
   b. Inconclusive findings on recent cranial ultrasound or CT Head
   c. Partial seizures
   d. Focal neurologic deficits

III. CNS infection (meningitis/encephalitis) or abscess with evidence of infection and neurologic complaints or findings or follow up of known cerebral infection\textsuperscript{7-10} [(Both A and B for new infection) or C or D or E or F]

A. Findings suggesting infection [One of the following]
1. Aural temperature > 38.3°C or > 100.9°F
2. Leukocytosis, WBC > 11,500/cu.mm
3. Known infection elsewhere
4. Immunocompromised patient

B. Other clinical findings [One of the following]
1. Headache
2. Acute or subacute ataxia
3. Drowsiness or confusion
4. Focal neurological findings
5. Vomiting
6. Seizure
7. Stiff neck
8. Photophobia
9. Recurrence of symptoms after antibiotic therapy

C. Creutzfeldt-Jakob disease

D. Bickerstaff encephalitis – usually follows a viral illness [Both of the following]
1. Ophthalmoplegia
2. Cerebellar ataxia

E. Fisher syndrome [Both of the following]
1. Ophthalmoplegia
2. Cerebellar ataxia

F. Follow-up during and after completion of therapy to assess effectiveness
IV. Brain tumor\textsuperscript{10-19} (MRI without and with contrast) [One of the following]

A. Clarification of brain mass detected on CT exam or prior non contrast MRI
   (For evaluation of possible pituitary problems, please see indication XIII below)

B. Evaluation of known primary brain tumor which may include but not limited to any of the following brain tumors:
   - Astrocytoma
   - Choroid plexus papilloma
   - Ependymoma
   - Glioma
   - Glioblastoma
   - Glioblastoma multiforme
   - Hemangioblastoma
   - Medulloblastoma
   - Meningioma
   - Craniopharyngioma
   - Oligodendroglioma
   - Pituitary adenoma (Please see XIII below)
   - Primitive neuroectodermal tumor (PNET)

1. New signs and symptoms or worsening neurological condition [One of the following]
   a. Motor weakness affecting a limb, or one side of the face or body
   b. Decreased sensation affecting a limb, or one side of the face or body
   c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   d. Confusion including memory loss and disorientation
   e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   g. Dysarthria (speech disorder resulting from neurological injury)
   h. Dysphagia with no GI cause
   i. Vertigo with either headache or nystagmus
   j. Numbness, tingling, paresthesias
   k. Decreased level of consciousness
   l. Papilledema
   m. Stiff neck
   n. New onset of severe headache
   o. Drowsiness
   p. New onset of vomiting
   q. Nystagmus
   r. Cranial nerve palsy
   s. Gait disturbance
   t. Personality or behavioral changes
   u. New seizure
v. Hearing loss or new onset tinnitus  
w. Agitation  
x. Somnolence  
y. Slow response to verbal communication  
z. Sudden falls  
  aa. Balance problems  

2. Interval re-evaluation of known brain tumor [One of the following]  
  a. Anaplastic astrocytoma, anaplastic oligodendroglioma or glioblastoma  
     multiforme or any high-grade or aggressive primary brain tumor [One of the following]  
       i. Initial Staging  
       ii. Re-image after surgery (complete or subtotal)  
       iii. Image 2 to 6 weeks after completion of radiation therapy  
       iv. Following completion of chemotherapy  
       v. For measurable disease undergoing chemotherapy treatments:  
          every 2 cycles  
       vi. Surveillance imaging every 3 months for 3 years and every 6 months thereafter  
       vii. New signs and symptoms (See 1 above) regardless of date of last imaging  
  b. Low-grade infiltrative supratentorial astrocytoma or oligodendroglioma  
       i. Initial Staging  
       ii. Re-image after surgery (complete or subtotal)  
       iii. Image 2 to 6 weeks after completion of radiation therapy  
       iv. Following completion of chemotherapy  
       v. For measurable disease undergoing chemotherapy treatments:  
          every 2 cycles  
       vi. Surveillance imaging every 3 months for 2 years, then every 6 months for 3 years then annually  
  c. Ependymoma  
       i. Initial Staging  
       ii. Re-image after surgery (complete or subtotal)  
       iii. For measurable disease undergoing chemotherapy treatments:  
          every 2 cycles  
       iv. Image 2 to 6 weeks after completion of radiation therapy  
       v. Following completion of chemotherapy  
  d. Surveillance every 3 months for 1 year, then every 6 months for 1 year,  
     then annually thereafter,  
  e. Medulloblastoma and supratentorial PNET  
       i. Initial Staging  
       ii. Re-image after surgery (complete or subtotal)  
       iii. For measurable disease undergoing chemotherapy treatments:  
          every 2 cycles  
       iv. Image 2 to 6 weeks after completion of radiation therapy  
       v. Following completion of chemotherapy
vi. Surveillance every 3 months for 2 years, then every 6 months for 3 years, then annually thereafter

f. Meningioma
   i. Initial Staging of Intracranial Meningioma: MRI Brain without and with (CPT® 70553)
   ii. Re-image after surgery (complete or subtotal)
   iii. Image 2 to 6 weeks after completion of radiation therapy
   iv. Following completion of chemotherapy
   v. For measurable disease undergoing chemotherapy treatments: every 2 cycles
   vi. Surveillance - If unresected or WHO Grade 1 (benign) or 2 (atypical) image at 3, 6, 12 months after diagnosis then every 6 months for years 2 and 3, then annually for years 4 and 5 and then every 3 years thereafter
   vii. Surveillance - WHO Grade 3 (malignant) image every 3 months for 3 years and then every 6 months thereafter.

g. CNS Lymphoma
   i. For initial staging
   ii. Monitoring response to treatment every 2 cycles (6 to 8 weeks) during chemotherapy
   iii. Imaging after completion of chemotherapy to establish new baseline
   iv. Surveillance after completion of chemotherapy every 3 months for 2 years then every 6 months for 3 years and then annually thereafter

h. New signs and symptoms or worsening neurological condition [One of the following]
   i. Motor weakness affecting a limb, or one side of the face or body
   ii. Decreased sensation affecting a limb, or one side of the face or body
   iii. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   iv. Confusion including memory loss and disorientation
   v. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   vi. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   vii. Dysarthria (speech disorder resulting from neurological injury)
   viii. Dysphagia with no GI cause
   ix. Vertigo with either headache or nystagmus
   x. Numbness, tingling, paresthesias
   xi. Decreased level of consciousness
   xii. Papilledema
   xiii. Stiff neck
   xiv. New onset of severe headache
   xv. Drowsinessness
   xvi. New onset of vomiting
xvii. Nystagmus
xviii. Cranial nerve palsy
xix. Gait disturbance
xx. Personality or behavioral changes
xxi. New seizure
xxii. Hearing loss or new onset tinnitus
xxiii. Agitation
xxiv. Somnolence
xxv. Slow response to verbal communication
xxvi. Sudden falls
xxvii. Balance problems

C. **Evaluation for known or suspected brain metastases** in patients with known extra cranial malignancy [One of the following]

1. **Routine initial staging** for the following [One of the following]
   a. Certain sub-types of sarcomas (angiosarcoma and alveolar soft part sarcoma)
   b. Melanoma stage III or higher
   c. Small cell lung cancer
   d. Non-small cell lung cancer

2. New neurological signs or symptoms with **any other known malignancy and any stage** [One of the following]
   a. Motor weakness affecting a limb, or one side of the face or body
   b. Decreased sensation affecting a limb, or one side of the face or body
   c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   d. Confusion including memory loss and disorientation
   e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   g. Dysarthria (speech disorder resulting from neurological injury)
   h. Dysphagia with no GI cause
   i. Vertigo with either headache or nystagmus
   j. Numbness, tingling, paresthesias
   k. Decreased level of consciousness
   l. Papilledema
   m. Stiff neck
   n. New onset of severe headache
   o. Drowsiness
   p. New onset of vomiting
   q. Nystagmus
   r. Cranial nerve palsy
   s. Gait disturbance
   t. Personality or behavioral changes
   u. New seizure
   v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems

3. Prior to prophylactic cranial irradiation for small cell lung cancer
4. If prophylactic cranial irradiation is not given for small cell lung cancer
   a. MRI Brain without and with contrast (CPT® 70553) every 4 months for the first 2 years

5. Follow-up known brain metastases during and after chemotherapy [One of the following]
   a. Follow-up every 2 cycles (6 to 8 weeks) during chemotherapy
   b. At completion of chemotherapy to establish a new baseline
   c. Imaging every 3 months for 1 year after completion of chemotherapy and every 6 months thereafter
   d. Melanoma stage IIB or higher with no evidence of disease annually for 5 years

6. Follow-up known brain metastases after whole brain radiation therapy [One of the following]
   a. Follow-up after intervention to establish a new baseline
   b. Imaging every 3 months for 1 year after completion of whole brain radiation therapy and every 6 months thereafter
   c. Melanoma stage IIB or higher with no evidence of disease annually for 5 years

7. Follow-up known brain metastases after stereotactic radiosurgery (SRS) such as CyberKnife® or Gamma Knife® radiation treatment
   a. Follow-up after intervention to establish a new baseline
   b. Imaging every 3 months for 1 year after completion of SRS and every 6 months thereafter
   c. Melanoma stage IIB or higher with no evidence of disease annually for 5 years

8. Follow-up known brain metastases after surgery [One of the following]
   a. Follow-up after intervention to establish a new baseline
   b. Imaging every 3 months for 1 year after surgery and every 6 months thereafter
   c. Melanoma stage IIB or higher with no evidence of disease annually for 5 years

9. Known brain metastases with new neurological signs or symptoms such as indicated in C2

D. Cranial nerve palsy – See V below
E. Suspected brain tumor [One of the following]
   1. New onset of neurologic findings [One of the following]
      a. Motor weakness affecting a limb, or one side of the face or body
      b. Decreased sensation affecting a limb, or one side of the face or body
      c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
d. Confusion including memory loss and disorientation

e. Impaired vision, including amaurosis fugax, visual field loss and diplopia

f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)

g. Dysarthria (speech disorder resulting from neurological injury)

h. Dysphagia with no GI cause

i. Vertigo with either headache or nystagmus

j. Numbness, tingling, paresthesias

k. Decreased level of consciousness

l. Papilledema

m. Stiff neck

n. New onset of severe headache

o. Drowsiness

p. New onset of vomiting

q. Nystagmus

r. Cranial nerve palsy

s. Gait disturbance

t. Personality or behavioral changes

u. New seizure

v. Hearing loss or new onset tinnitus

w. Agitation

x. Somnolence

y. Slow response to verbal communication

z. Sudden falls

aa. Balance problems

V. Suspected tumor of or affecting one or more cranial nerves\textsuperscript{20-23}

A. Anosmia

B. Weakness or paralysis of muscles of mastication

C. Sensory loss in the head and neck

D. Weakness or paralysis of facial expression

E. Weakness of the palate

F. Vocal cord paralysis

G. Weakness or paralysis of the sternocleidomastoid muscle

H. Weakness or paralysis of the trapezius

I. Weakness or paralysis of the tongue

VI. Suspected or known AVM\textsuperscript{24,25} (arteriovenous malformation) [One of the following]

A. Known AVM documented by CTA, MRA, MRI, catheter angiogram [One of the following]

1. Immediate follow-up after a therapeutic procedure (i.e., surgery, embolization, radiosurgery)

2. New or worsening clinical findings [One of the following]

   a. Motor weakness affecting a limb, or one side of the face or body

   b. Decreased sensation affecting a limb, or one side of the face or body
c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
d. Confusion including memory loss and disorientation
e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
g. Dysarthria (speech disorder resulting from neurological injury)
h. Dysphagia with no GI cause
i. Vertigo with either headache or nystagmus
j. Numbness, tingling, paresthesias
k. Decreased level of consciousness
l. Papilledema
m. Stiff neck
n. New onset of severe headache
o. Drowsiness
p. New onset of vomiting
q. Nystagmus
r. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure or change in seizure type
v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems

3. Planning of intervention (surgical or interventional)

B. Suspected AVM [One of the following]
1. Severe unexplained headache (thunderclap headache)
2. Altered level of consciousness
3. Focal neurologic findings [One of the following]
   a. Motor weakness affecting a limb, or one side of the face or body
   b. Decreased sensation affecting a limb, or one side of the face or body
   c. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
   d. Confusion including memory loss and disorientation
   e. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   f. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   g. Dysarthria (speech disorder resulting from neurological injury)
   h. Dysphagia with no GI cause
   i. Vertigo with either headache or nystagmus
   j. Numbness, tingling, paresthesias
k. Decreased level of consciousness
l. Papilledema
m. Stiff neck
n. New onset of severe headache
o. Drowsiness
p. New onset of vomiting
q. Nystagmus
r. Cranial nerve palsy
s. Gait disturbance
t. Personality or behavioral changes
u. New seizure
v. Hearing loss or new onset tinnitus
w. Agitation
x. Somnolence
y. Slow response to verbal communication
z. Sudden falls
aa. Balance problems

4. Subarachnoid hemorrhage on recent CT or MRI of the brain
5. Subarachnoid hemorrhage on lumbar puncture
6. Intracerebral bleed or hematoma, or hemorrhage on prior CT or MRI of the brain
7. Screening
   b. Familial cavernoma: Screening should include MRI Head without or without and with contrast (with gradient echo images).

VII. Systemic disease affecting the brain\textsuperscript{26-30} [One of the following]
\hspace{1em} A. Systemic lupus erythematosus (SLE) or vasculitis [One of the following]
\hspace{2em} 1. Alteration in level of consciousness
\hspace{2em} 2. Cranial nerve involvement
\hspace{1em} B. HIV [One of the following]
\hspace{2em} 1. Cerebritis
\hspace{2em} 2. Encephalitis
\hspace{2em} 3. Meningitis
\hspace{2em} 4. Vasculitis
\hspace{1em} C. Sarcoidosis

VIII. Demyelinating disease\textsuperscript{20,31-36} (includes both known or suspected MS) [One of the following]
\hspace{1em} A. Multiple sclerosis [One of the following]
\hspace{2em} 1. Clinical findings or symptoms [One of the following]
\hspace{3em} a. Difficulty walking
\hspace{3em} b. Ataxia
\hspace{3em} c. Numbness
\hspace{3em} d. Bladder dysfunction
\hspace{3em} e. Optic neuritis
f. Weakness face, arms or legs
g. Difficulty with balance
h. Vertigo
i. Hearing loss
j. Constipation
k. Memory loss
l. Lhermitte’s sign
m. Double vision
n. Blurred vision
o. Painful movement of the eye
p. Nystagmus
q. Impaired coordination
r. Dysarthria
s. Dysphagia
t. Neuropathic pain including trigeminal neuralgia or extremity pain

2. Baseline, in 3 to 6 months and then annually when instituting or maintaining immune-modulating agents and when changing therapy


4. Screening with MRI Brain every 6 months if JC virus positive on Tysabri or other treatments known to increase risk of PML.

IX. Suspected acoustic neuroma (schwannoma) or cerebellopontine angle tumor21,37-39 [One of the following]

A. Findings/test results [One of the following]
   1. Asymmetric sensorineural hearing loss by bedside testing or formal audiometry
   2. Facial weakness
   3. Altered sense of taste
   4. Tinnitus
   5. Balance problems
   6. Facial numbness

B. After surgical resection, MRI Head without and with contrast with attention to the internal auditory canals (CPT® 70553) is performed at 6 to 12 months to document the completeness of tumor removal and to serve as a baseline for further follow-up. Assuming complete tumor removal, additional follow up is done at 5 and 10 years. If the findings at 10 years are normal, no further imaging should be performed unless new clinical symptoms occur.

C. Following stereotactic radiation therapy or continued observation without treatment:
   1. MRI Head without and with contrast with attention to the internal auditory canals (CPT® 70553) is performed at 6 months and then annually

D. Neurofibromatosis: annual MRI Brain beginning at age 10 years for patients with NF2
X. Labyrinthitis, vestibular neuronitis\textsuperscript{21} [All of the following]
   A. Episodic vertigo
   B. Ear normal by PE
   C. Continued or worsening vertigo after at least one week of medical treatment with any appropriate medication

XI. Suspected cerebral venous thrombosis\textsuperscript{2,40-45} [Both A and B]
   A. Symptoms [One of the following]
      1. Papilledema
      2. Headaches
      3. Mental status changes
      4. Vomiting
      5. Changes in vision
      6. Seizures
      7. Lethargy or coma
      8. Alternating focal neurological deficits
      9. Hemiparesis or paraparesis
   B. Risk factors [One of the following]
      1. Postpartum
      2. Postoperative status
      3. Skull fracture over dural sinus
      4. Calvarial mass
      5. Meningitis, sinusitis or middle ear infections
      6. Hypercoagulable state [One of the following]
         a. Personal history of cancer
         b. Factor V Leiden mutation
         c. MTHFR
         d. SLE
         e. Sickle cell disease
         f. Contraceptive medications
         g. Protein C deficiency
         h. Protein S deficiency
         i. Antiphospholipid antibodies
         j. Elevated lipoprotein (a)
         k. Elevated platelet count
         l. Prothrombin 20210 gene mutation
         m. Antithrombin III deficiency
         n. Other medications
      7. Ear infection
      8. Brain tumor by history

XII. Evaluation of tinnitus\textsuperscript{46-49} (ringing, hissing, buzzing, roaring, clicking, or rough sounds heard by patient)
   A. Tinnitus localized to a single ear
   B. Pulsatile Tinnitus
   C. Focal neurological abnormalities
   D. Asymmetric hearing loss
XIII. Suspected pituitary abnormality including macroadenomas and microadenomas\textsuperscript{50-61} [One of the following]

A. Endocrine laboratory studies should be performed prior to considering advanced imaging, including Prolactin levels; thyroid function levels should also be checked to evaluate for untreated or inadequately treated hypothyroidism as a cause of hyperprolactinemia and pituitary hyperplasia

B. Pituitary imaging is primarily performed with MRI head without and with contrast (CPT\textsuperscript{©} 70553)
   1. If a pituitary abnormality is reported incidentally on a MRI Brain or CT Brain performed for other reasons, a follow-up dedicated pituitary study may be obtained (Brain MRI Brain without and with contrast CPT\textsuperscript{©} 70553 or MRI Orbit/Face/Neck CPT\textsuperscript{©} 70543. CPT\textsuperscript{©} 70553 covers both brain and dedicated pituitary if performed at the same time; no additional CPT\textsuperscript{©} codes are needed.)

C. Prolactinomas
   1. Unexplained elevated prolactin: normal prolactin level above normal reference range.
      a. After initial start of dopamine agonist therapy, repeat MRI in 1 year (or in 3 months if macroprolactinoma), also repeat if prolactin levels continue to rise while on dopaminergic agents, or if new symptoms emerge (e.g., galactorrhea, visual disturbances, headaches, or other hormonal disorders occur)
      b. Image after 2 years of dopamine agonist treatment for those who are being considered for discontinuation of treatment due to remission
      c. After 2 years of dopamine agonist therapy, for those who have achieved normal Prolactin levels and no visible tumor remnant, and for whom dopamine agonists have been discontinued or tapered, image if prolactin level increases above normal range. Galactorrhea discharge with normal prolactin and thyroid function levels

D. Acromegaly: (Elevated IGF-1 confirmed by lack of suppression of growth hormone on glucose suppression testing, with or without acromegaly)
   1. MRI Brain without and with contrast (CPT\textsuperscript{©} 70553)
      a. At least 12 weeks after surgery to evaluate for residual tumor
      b. If treated with Pegvisomant, 6 to 12 months after treatment initiated, then annually if stable
      c. If hormone levels increase or neurological findings appear

E. Nonfunctioning Microadenomas: MRI without and with contrast (CPT\textsuperscript{©} 70553) at 6 and 12 months, then yearly for 3 years if stable. After 3 years then every other year for the next 6 years, then every 5 years if stable.
   1. C TSH, FSH and LH producing: MRI head without and with contrast (CPT\textsuperscript{©} 70553) when hormone levels are inappropriately elevated.
   2. Adrenocorticotropic hormone (ACTH) > 46 pg/mL (Cushing’s disease)
   3. Precocious puberty [One of the following]
      a. Defined as the appearance of secondary sexual characteristics before age 8 in girls and before age 9 in boys.
b. When precocious puberty is documented on physical examination, endocrine lab studies are not necessary prior to advanced imaging

F. Hypopituitarism including hypogonadism [One of the following]
   1. Pituitary apoplexy [One of the following]
      a. Acute headache with vomiting
      b. Ophthalmoplegia
      c. Amaurosis
      d. Depressed level of consciousness
      e. Bitemporal hemianopsia
   2. Acquired hypopituitarism [One of the following]
      a. Cranial irradiation
      b. Brain surgery
      c. Head trauma
      d. Empty sella
      e. Hemochromatosis
      f. Prior brain infection
      g. Known pituitary tumor
      h. Langerhans cell histiocytosis of the pituitary
   3. Gonadotropin deficiency or hypogonadism
      a. Male [Both of the following]
         i. History [One of the following]
            01. Loss of libido
            02. Impotence
            03. History of undescended testicle or cryptorchism
            04. History of testicular failure
            05. History of chemotherapy or radiation therapy
            06. Visual field disorder
            07. Decreased body hair
            08. Gynecomastia
            09. Galactorrhea
         ii. Laboratory tests
            01. MRI head without and with contrast (CPT® 70553). Severe secondary hypogonadism (morning serum testosterone level < 150 ng/dl and low or normal LH and FSH levels)
            02. Serum, free, or bioavailable morning testosterone level below normal range and low or normal LH and FSH levels accompanied by one of the following:
               a. Panhypopituitarism, hyperprolactinemia, symptoms or signs of tumor mass effect (e.g. headache, visual impairment, or visual field deficit), ****suspected alterations in sex hormone binding globulin (SHBG)
      b. Female [Both of the following]
         i. Oligomenorrhea or amenorrhea
         ii. Low normal LH, FSH
a. Adults [One of the following]
   i. History of radiation or surgery to the pituitary or hypothalamic region
   ii. Decreased levels of 3 or more pituitary hormones (TSH, LH, FSH, ACTH, GHRH, ADH)
   iii. Decreased levels of IGF-I (Insulin-like growth factor I) based on laboratory normal range
   iv. Insulin tolerance test (contraindicated in individuals with history of seizures or coronary artery disease)
      01. Growth hormone response ≤ 10 ng/mL [micrograms/L]
   v. Arginine stimulating test
      01. Growth hormone response ≤ 10 ng/mL [micrograms/L]

b. Children with no evidence of malignancy, Crohn's disease, renal disease, hypothyroidism or Turner syndrome and one of the following
   i. Bone age more than 2 standard deviations below the mean for age
   ii. History of surgery or radiation in the pituitary or hypothalamic regions
   iii. Endocrine testing should be performed initially. For isolated growth hormone deficiency two measurements of growth hormone with stimulation are performed
   iv. History of intrauterine growth retardation
   v. Prader-Willi syndrome
   vi. Children over the age of 1
      01. Insulin tolerance test positive with GH response of ≤ 10 ng/mL [micrograms/L]
   vii. Neonate random growth hormone level < 20 ng/mL [micrograms/L]
   viii. Precocious puberty [One of the following]
      01. Random LH > .2 IU/L
      02. Gonadotropin stimulating test using leuprolide with 2 to 3 fold rise in LH and FSH
      03. Bone age greater than chronological age

8. Visual problems [One of the following]
   a. Bitemporal visual field loss – loss of peripheral vision bilaterally
   b. Optic atrophy
   c. Drooping eyelid
   d. Diabetes insipidus

G. Known pituitary tumor (adenoma, microadenoma, macroadenoma)
   1. Following transsphenoidal resection
   2. Following radiation therapy
   3. New signs or symptoms such as visual changes, new headache, new onset of vomiting, papilledema, drooping eyelid, optic atrophy
   4. Follow up of asymptomatic nonfunctioning microadenoma < 10 mm in size MRI head without and with contrast (CPT® 70553)
      a. 6 and 12 months, then yearly for 3 years if stable. After 3 years, then every other year for the next 6 years, then every 5 years unless new signs and symptoms if stable.
5. Follow up of asymptomatic nonfunctioning macroadenoma MRI head without and with contrast (CPT® 70553) every: 6 months for the first year; then:
   a. Annually for 5 years (longer if craniopharyngiomas
   b. Every 6 months if treatment is deferred.

H. Empty Sella Turcica: follow up 1 to 5 years after the initial study can be performed

XIV. Suspicion of trigeminal neuralgia
A. Symptoms [One of the following]
   1. Intermittent pain in the distribution of V2 and/or V3
   2. Facial spasm
   3. Failed medical management

XV. Neurofibromatosis [One of the following]
A. Common syndrome inherited in an autosomal dominant manner (50% risk to offspring) affecting 1 in 2500 people. The diagnosis is commonly made based on established clinical criteria including café-au-lait spots, Lisch nodules of the iris, axillary freckling, family history, and the presence of NF-associated tumors. NF1-affected persons have increased sensitivity to ionizing radiation, so CT and nuclear medicine imaging are not appropriate screening or surveillance studies for these patients.

XVI. Neurosarcoi
d A. Adult with known sarcoid and one of the following
   1. Cranial nerve palsy (See V above)
   2. Headache
   3. Seizure
   4. Sensory deficit
   5. Pituitary dysfunction
   6. Vision loss
   7. Cognitive changes
   8. Psychiatric symptoms

B. Children with known sarcoid and one of the following
   1. Seizures
   2. Short stature
   3. Diabetes insipidus
   4. Lack of sexual maturation
   5. Cranial nerve palsy (See V above)
   6. Headache
   7. Sensory deficit
   8. Pituitary dysfunction
   9. Vision loss
   10. Cognitive changes
   11. Psychiatric symptoms
XVII. Short stature with height 2 standard deviations below the mean for age and gender\textsuperscript{71} [One of the following]
A. History of surgery or radiation in the pituitary or hypothalamus regions
B. Growth hormone levels below normal ($\leq 10 \text{ ng/mL}$ [micrograms/L]) for isolated growth hormone deficiency, two measurements of growth hormone with stimulation are performed.
C. History of intrauterine growth retardation
D. Prader-Willi syndrome
E. Children over the age of 1
   1. Insulin tolerance test positive
      a. Growth hormone response $\leq 10 \text{ ng/mL}$ [micrograms/L]

XVIII. Papilledema with or without headache

XIX. Cerebral hypotension\textsuperscript{72}
A. Headache [One of the following]
   1. Increases when the individual is upright and decreases quickly when recumbent
   2. Increases with coughing, straining, sneezing

XX. Proptosis including thyroid eye disease and exophthalmus\textsuperscript{20} [One of the following]
A. Orbital asymmetry in a child with loss or decreased vision or sight
B. Adult with painful loss or decreased vision or sight
C. Hyperthyroidism with visual loss or visual compromise (Graves’ disease)

XXI. Visual field deficit [One of the following]
A. Bitemporal hemianopsia (loss of peripheral vision)
B. Homonymous hemianopsia (loss of vision in the nasal half of one eye and the outer half of the other eye)
C. Scotoma (loss of central vision)
D. Heteronymous hemianopsia (loss of vision in either the nasal half or the outer half of both eyes)

XXII. Hearing loss\textsuperscript{21,22} [One of the following]
A. Suspected cholesteatoma and audiogram demonstrating conductive hearing loss (CT of the temporal bone) and one of the following
   1. Acute and intermittent vertigo
   2. Painless otorrhea

XXIII. Purulent drainage from the ear or mastoid area
A. Purulent drainage and granulation tissue in the ear
B. Conductive hearing loss documented on recent audiogram (CT of the temporal bone)
C. Total deafness, congenital hearing loss (CT of the temporal bone)
D. Preoperative planning for cochlear implants (CT of the temporal bone)
E. Fluctuating hearing loss
F. Glomus tumor with reddish-blue mass in the ear
G. Sensorineural hearing loss on recent audiogram
H. Mixed conductive and sensorineural hearing loss on recent audiogram

XXIV. Vertigo
A. Episodic with or without associated hearing loss or tinnitus
B. Central vertigo with or without other symptoms
   1. Any associated neurological signs or symptoms
   2. Cerebrovascular symptoms of TIA or CVA
   3. Examples include drop attacks, seizures, coincident headache, ataxia, aura or focal neurological findings
   4. Equivocal or unusual nystagmus findings, including direction changing or persistent downbeat nystagmus
   5. Absent head thrust sign
C. Short duration (minutes) recurrent attacks

XXV. Facial Palsy
A. MRI brain without and with contrast (CPT® 70553) or MRI head without contrast (CPT® 70551) (with attention to posterior fossa and IACs) is considered with the following “red flags” of unexplained facial paresis/paralysis in clinical scenarios with:
   1. Trauma to the temporal bone
   2. History of tumor systemic cancer, HIV or Lyme disease
   3. No improvement in 8 weeks
   4. No full recovery in 3 months
   5. Gradual onset over weeks to months
   6. Vertigo or hearing loss
   7. Bilateral involvement
   8. Other Atypical or Inconsistent features including:
      a. Second episode of paralysis on the same side
      b. Paralysis of isolated branches of the facial nerve
      c. Paralysis associated with other cranial nerves
   9. MRI head without and with contrast (CPT® 70553) may be considered for suspected neurosarcoid/sarcoid

XXVI. Hemifacial Spasm
- MRI brain without and with contrast (CPT® 70553) CTA Head – CPT® 70496 or MRA Head - CPT® 70544 prior to a vascular decompression surgical procedure to clarify the vascular anatomy.

XXVII. Abrupt onset of a neurologic deficit – including stroke and TIA [One of the following]
A. Motor weakness affecting a limb, or one side of the face or body
B. Decreased sensation affecting a limb, or one side of the face or body
C. Acute or subacute ataxia (unsteady and clumsy motion of the limbs or trunk)
D. Confusion including memory loss and disorientation
E. Impaired vision, including amaurosis fugax, visual field loss and diplopia
F. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
G. Dysarthria (speech disorder resulting from neurological injury)
H. Dysphagia with no GI cause
I. Vertigo with either headache or nystagmus
J. Numbness, tingling, paresthesias
K. Decreased level of consciousness
L. Papilledema
M. Stiff neck
N. New onset of severe headache
O. Drowsiness
P. New onset of vomiting
Q. Nystagmus
R. Cranial nerve palsy
S. Gait disturbance
T. Personality or behavioral changes
U. New seizure
V. Hearing loss or new onset tinnitus
W. Agitation
X. Somnolence
Y. Slow response to verbal communication
Z. Sudden falls
AA. Balance problems

XXVIII. Follow up of known subarachnoid hemorrhage with negative angiogram^24

XXIX. Follow up of known intracerebral (parenchymal) hemorrhage^24

XXX. Chronic daily headache –^78
A. New neurologic deficit
   1. Motor weakness affecting a limb, or one side of the face or body
   2. Decreased sensation affecting a limb, or one side of the face or body
   3. Acute ataxia (unsteady and clumsy motion of the limbs or trunk)
   4. Confusion including memory loss and disorientation
   5. Impaired vision, including amaurosis fugax, visual field loss and diplopia
   6. Aphasia (loss or impairment of the ability to produce or comprehend language due to brain damage)
   7. Dysarthria (speech disorder resulting from neurological injury)
   8. Dysphagia with no GI cause
   9. Vertigo with either headache or nystagmus
  10. Numbness, tingling, paresthesias
  11. Decreased level of consciousness
  12. Papilledema
  13. Stiff neck
  14. New onset of severe headache
  15. Drowsiness
16. New onset of vomiting
17. Nystagmus
18. Cranial nerve palsy
19. Gait disturbance
20. Personality or behavioral changes
21. New seizure
22. Hearing loss or new onset tinnitus
23. Agitation
24. Somnolence
25. Slow response to verbal communication
26. Sudden falls
27. Balance problems

XXXI. Unilateral headache with suspicion of carotid or vertebral dissection or unilateral Horner’s syndrome (CTA or MRA or MRI) [One of the following]
A. Neck pain
B. Unilateral facial or orbital pain
C. Unilateral headaches
D. Horner’s syndrome, miosis and ptosis (contraction of the iris, drooping eyelid)
or
E. Transient ischemic attacks (TIA)
F. Minor neck trauma
G. Rapid onset of headache with strenuous exercise or Valsalva maneuver

XXXII. Temporal arteritis [All of the following]
A. ESR > 55mm/hr
B. Temporal tenderness

XXXIII. New headache in immunocompromised individual

XXXIV. Progressive worsening of headache

XXXV. Headache associated with cough, exertion or sexual activity

XXXVI. Ataxia
A. Progressive or long duration
B. Possible stroke
C. May be acute or subacute associated with infection
D. Possible posterior fossa mass (primary or metastatic)
E. Cowden’s syndrome
F. Congenital ataxia
G. Joubert syndrome

XXXVII. Ophthalmoplegia

XXXVIII. Encephalocele

XXXIX. Molar Pregnancy and GTN
A. Individuals should undergo brain imaging (preferably MRI brain without and with contrast - CPT® 70553), CT abdomen and pelvis with contrast (CPT® 74177), and chest x-ray as a metastatic work up.
   1. Treatment is usually methotrexate.
   2. Weekly HCG tests are performed until they fall to zero.

XL. Recurrent Laryngeal Palsy – The following can be considered with unilateral vocal cord/fold palsy identified by laryngoscopy:84
   A. MRI head without and with contrast (CPT® 70553) or MRI head without contrast (CPT® 70551)
   B. CT neck with contrast 70491) or MRI Neck without and with contrast (CPT® 70543);
      1. Chest CT with contrast (CPT® 71260) may be added with left vocal cord palsy

XLI. Eye Disorders85-92
   A. MRI head without and with contrast (CPT® 70553) and/or MRI orbit without and with contrast (CPT® 70543) or MRI head without contrast (CPT® 70551) and/or MRI orbit without contrast (CPT® 70540).1, 2, 3 may be considered in the following scenarios:
      1. Anisocoria which is of new onset (e.g. not present in previous photographs) and >= 1 mm
      2. Acute or progressive vision loss due to any cause, including suspected optic neuritis
      3. Ophthalmoplegia
      4. Binocular Diplopia
      5. Horner’s Syndrome, for which CT Neck with contrast and/or CT Chest with contrast may be considered in addition to the head or orbital imaging
      6. CT head without contrast may be substituted for the MRI imaging if there has been a head injury
   B. Evaluation of a third nerve palsy may be accomplished with an MRI head without and with contrast(CPT® 70553) and/or MRA brain without contrast
      1. CT head without and with contrast (CPT® 70470) and/or CT orbit with contrast (CPT® 70481) can be approved if there is a clinical question of blood in the subarachnoid space.
   C. If MRI contraindicated or cannot be performed, CT head without and with contrast (CPT® 70470), CT orbit with contrast (CPT® 70482) or CT orbit without and with contrast may be considered as substitutes.
XLII. Movement Disorders

A. MRI of the brain without, or without and with contrast (CPT® 70551 or CPT®70553) is considered in the following clinical scenarios:

1. **Atypical Parkinsonism** because of unusual clinical features (for example, persistent unilateral signs and symptoms, young onset under age of 50, rapid progression), incomplete or uncertain medication responsiveness, or clinical diagnostic uncertainty. These cases should be forwarded for medical director review.

2. Suspected Huntington Disease

3. Evaluation for surgical treatment or Essential Tremor or Parkinson’s disease, including Deep Brain Stimulator placement.

XLIII. Pediatric Epilepsy and other seizure disorders\(^{98-104}\) - A recent (within 60 days) face-to-face evaluation including a detailed history, physical examination with a thorough neurologic examination, and appropriate laboratory studies should be performed prior to considering advanced imaging, unless the patient is undergoing guideline-supported scheduled follow-up imaging evaluation. This clinical evaluation should also include family history and (whenever possible) the accounts of eyewitnesses to the event(s).

A. Initial Imaging of Non-Febrile seizures

1. MRI brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
   a. First-time seizure in child ≥ 12 months of age that has no known cause and is not associated with fever
   b. Inconclusive findings on recent cranial ultrasound or CT Head
   c. Partial seizures
   d. Focal neurologic deficits
   e. Patients requiring sedation should generally not have noncontrast MRI studies. See [Pediatric Head Imaging Modality General Considerations (noted below)]

2. CT Head without contrast (CPT® 70450) is indicated for the following:
   a. First-time seizure in child associated with recent head trauma
   b. Patient cannot safely undergo MRI (avoidance of sedation is not an indication)

3. Cranial ultrasound (CPT® 76506) is indicated for the following:
   a. First-time seizure in child in child < 12 months of age that has no known cause and is not associated with fever if the infant has an open fontanelle.

4. The following imaging tests do not generally add valuable information initially and are not indicated for the initial evaluation of seizures in children:
   a. CTA Head or Neck
   b. MRA Head or Neck
c. MRI Cervical, Thoracic, Lumbar Spine

B. Repeat imaging on indication
1. Repeat MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
   a. New or worsening focal neurologic deficits
   b. Increase in severity or frequency of seizures despite documented therapeutic antiepileptic drug levels
   c. Change in seizure type
   d. Preoperative evaluation for epilepsy surgery
   e. Patients requiring sedation should generally not have noncontrast MRI studies. See Pediatric Head Imaging Modality General Considerations (noted below).

C. Evaluation for Epilepsy Surgery
1. These cases should be forwarded for medical review
2. PET Brain Metabolic (CPT® 78608)
3. Functional MRI Brain (CPT® 70554 or CPT® 70555)
4. MR Spectroscopy (CPT® 76390)
   a. NOTE: Certain payers consider MR Spectroscopy investigational/experimental, and those coverage policies take precedence over eviCore Imaging Guidelines.

D. Febrile Seizures
1. Neuroimaging should not be performed in the routine evaluation of children with simple febrile seizures

XLIV. Pediatric Head Imaging Modality General Considerations

A. MRI
1. MRI is the preferred modality for imaging the pediatric head unless otherwise stated in a specific guideline section
2. Due to the length of time for image acquisition and the need for stillness, anesthesia is required for almost all infants and young children (age < 7 years), as well as older children with delays in development or maturity. In this patient population, MRI imaging sessions should be planned with a goal of avoiding a short-interval repeat anesthesia exposure due to insufficient information using the following considerations:
   a. MRI should always be performed without and with contrast unless there is a specific contraindication to gadolinium use, since the patient already has intravenous access for anesthesia
      i. The U.S. Food and Drug Administration (FDA) has noted that there is currently no evidence to suggest that gadolinium retention in the brain is harmful and restricting gadolinium-based contrast agents (GBCAs) use is not warranted at this time. It has been recommended that GBCA use should be limited to circumstances in which additional information provided by the contrast agent is necessary and the necessity of repetitive MRIs with GBCAs should be assessed.
ii. If requesting clinicians indicate that a non-contrast study is being requested with specific concern for gadolinium retention, the exam can be approved.

b. If multiple body areas are supported by MSI guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same anesthesia session

B. CT

1. CT is generally inferior to MRI for imaging the pediatric head, but has specific indications in which it is the preferred modality listed in specific sections of these guidelines
   a. CT should not be used to replace MRI in an attempt to avoid sedation unless listed as a recommended study in a specific guideline section

C. Ultrasound

1. Cranial ultrasound (CPT® 76506) is a non-invasive means of evaluating for intracranial abnormalities in infants with an open anterior fontanelle
2. Transcranial Doppler ultrasonography has some utility in select populations of older children with known or suspected intracranial vascular disease

D. Nuclear Medicine

1. Nuclear medicine studies other than metabolic PET imaging on the pediatric brain or head are rarely performed in an elective outpatient setting, but the following studies can be approved when requested for the following indications:
   a. Brain Scintigraphy with or without vascular flow (any one of CPT®78600, CPT® 78601, CPT® 78605, or CPT® 78606)
      i. Establish brain death (rarely done in outpatient setting)
   b. Brain Imaging SPECT Technetium-99m or thallium-201 (CPT® 78607)
      i. Immunocompromised patients with mass lesion detected on CT or MRI for differentiation between lymphoma and infection
      ii. In distinguishing recurrent brain tumor from radiation necrosis
   c. Brain Imaging Vascular Flow (CPT® 78610)
      i. Cerebral ischemia
      ii. Establish brain death
   d. CSF Leakage Detection (CPT® 78650)
      i. Evaluation of CSF rhinorrhea or otorrhea, or refractory post-lumbar puncture headache
   e. Suspected normal pressure hydrocephalus with gait disturbance and either dementia or urinary incontinence
   f. Radiopharmaceutical Dacryocystography (CPT® 78660)
      i. Suspected obstruction of nasolacrimal duct due to excessive tearing
g. Imaging SPECT with Ioflupane I-23 (CPT® 78607) can be approved for differentiation of Parkinsonian syndrome (PS) and non-neurodegenerative disorders, such as essential tremor (ET) or drug-induced tremor, due to the overlap of clinical symptoms. DAT-SPECT has significant impact on clinical diagnosis and management of diagnostic uncertainty in cases of PS.

XLV. Behavioral Disorders
A. Bipolar disorder, schizophrenia, and related disorders may require advanced imaging in the following clinical circumstances: MRI Head without and with contrast (CPT® 70553)
   1. Atypical clinical presentation
   2. Acute onset
   3. Late onset over age 40
   4. Presents in setting of general medical illness or intensive care setting
   5. Non-auditory hallucinations (e.g., visual, tactile, olfactory)
   6. Patients who fail to respond to treatment in the expected manner and who manifest features suggestive of an organic brain disorder (for example, focal deficits, severe headache, or seizures) may undergo

XLVI. Ear Pain (Otalgia)
A. MRI Brain without and with (CPT® 70553) can be considered for:
   1. Common causes of ear pain including ear infections, dental problems, sinus infection, neck problems, tonsillitis, and pharyngitis, as well as otitis media or otitis externa or no obvious cause, which do not improve with treatment over a reasonable time
   2. Cerebellopontine angle or other intracranial tumor is suspected
   3. Nervus intermedius neuralgia in order to exclude a structural lesion

XLVII. Sudden Onset of Headache: MRI without and with contrast (CPT® 70553)

XLVIII. Hypersomnolence:
A. Magnetic resonance imaging (MRI) of the brain with contrast may be indicated when there are focal neurologic signs or suspicion for an inflammatory neurologic process as the etiology. Recognition and treatment of a comorbid sleep disorders is paramount, and a complete neurologic history and examination should precede any request for advanced imaging.

XLIX. Sinusitis
A. Orbital and/or Intracranial complications with ocular and/or neurological deficit
   1. MRI head without and with contrast (CPT® 70553)
B. A new obstructing sinus mass, including retention cysts and nasal polyps, that obscures the physician’s view on endoscopy
   1. MRI Head without and with contrast (CPT® 70553)
C. Fungal Sinusitis
   1. MRI Head without and with contrast (CPT® 70553)
L. **Restaging/Recurrence (Non-Melanoma Skin Cancers)**
   A. Recurrence of Merkel cell carcinoma
      1. MRI Brain without and with contrast (CPT® 70553)

LI. **Squamous Cell Carcinomas of the Head and Neck**
   A. Any head and neck cancer with neurological findings or suspicion of skull base invasion
      1. MRI Brain without and with contrast (CPT® 70553)

LII. **Pediatric CNS Infection**
   A. Pediatric-specific imaging considerations include suspected congenital brain infection and neonatal meningitis. The common causes of prenatal infections of the central nervous system are cytomegalovirus, *Toxoplasma gondii*, herpes simplex type 2 virus and most recently zika virus. The findings suggesting prenatal brain infection include microcephaly, microphthalmia, chorioretinitis, cataracts, hypotonia, and seizures. The following are performed for congenital brain infections:
      1. The following imaging is considered for newborn infants with suspected prenatal brain infection regardless of inciting organism. (For additional information see CDC’s Areas with risk of Zika site: [https://www.cdc.gov/zika/geo/active-countries.html](https://www.cdc.gov/zika/geo/active-countries.html).)
         a. Head ultrasound (CPT® 76506) can be approved as an initial imaging study.
         b. If the ultrasound is abnormal, MRI Brain without and with contrast (CPT® 70553) is indicated.
            i. Patients requiring sedation should generally not have only non-contrast MRI studies
   B. Neonatal meningitis is most often caused by bacterial pathogens and usually occurs as a complication of sepsis in the first week of life. In older infants and children, meningeal inoculation occurs secondary to hematogenous spread or penetrating trauma.
   C. The following imaging is considered for newborns or older infants with and open fontanelle and suspected meningitis.
      1. Head ultrasound (CPT® 76506) can be approved as an initial imaging study.
      2. If the ultrasound is abnormal, MRI Brain without and with contrast (CPT® 70553) is indicated.

LIII. **Pediatric Scalp and Skull Lesions**
   A. In neonates and young infants, scalp masses include:
      1. Congenital lesions (cephalocele-discussed above, dermoid cysts, epidermoid cyst),
      2. Vascular lesions (hemangioma, sinus pericranii), and
      3. Extracranial hemorrhage related to birth trauma (caput succedaneum, cephalohematoma, subgaleal hematoma).
4. After the first year of life, malignant tumors, such as Langerhans cell histiocytosis metastases from neuroblastoma and rhabdomyosarcoma are an additional cause of a scalp mass.

B. The following imaging is considered for newborns with palpable scalp and skull lesions.

1. Head ultrasound (CPT® 76506) or plain X-rays of skill can be approved as an initial imaging study.

2. If the ultrasound or X-ray is abnormal and associated anomalies are suspected, CT or MRI Brain without and with contrast (CPT® 70553) is indicated.

References:


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70552, 70553 MRI of the Brain with Contrast and MRI of the Brain without and with Contrast
f-MRI is useful in pre-operative scenarios to define the “eloquent” areas of brain

I. Evaluation of patients with seizures or brain tumors who are candidates for neurosurgical intervention. It must be evident that brain surgery is planned, and that f-MRI is being performed to avoid the language centers, or other processing centers, of the brain.

References:

15. Diagnostic Imaging: Pediatric Neuroradiology by A. James Barkovich, Anna Illner, Kevin R. Moore, Ellen Grant, Blaise V. Jones.

70554, 70555 Functional MRI of the Brain
For cancers not listed below please refer to NCCN guidelines.

I. General
   A. General Guidelines
      1. A current clinical evaluation (within 60 days) is required prior to
         considering advanced imaging.
         a. A clinical evaluation should include the following:
            i. A relevant history and physical examination.
            ii. Appropriate laboratory studies and non-advanced imaging
                modalities, such as plain x-ray or ultrasound.
      2. Other meaningful contact (telephone call, electronic mail or messaging) by
         an established patient can substitute for a face-to-face clinical evaluation.
      3. A Pulmonary or Thoracic Surgical Specialist can be helpful in evaluating
         thoracic disorders.
   B. Chest X-Ray
      1. A recent chest x-ray (generally within the last 60 days) that has been over
         read by a radiologist would be performed in many of these cases prior to
         considering advanced imaging,\textsuperscript{1,2}
         a. Identify and compare with previous chest films to determine presence
            and stability.
         b. Chest x-ray can help identify previously unidentified disease and may
            direct proper advanced imaging for such conditions as:
            i. Pneumothorax,
            ii. Pneumomediastinum,
            iii. Fractured ribs,
            iv. Acute and chronic infections, and
            v. Malignancies.
         c. Exceptions to preliminary chest x-ray may include such conditions as:
            i. Supraclavicular lymphadenopathy
            ii. Known Bronchiectasis
            iii. Suspected Interstitial lung disease
            iv. Positive PPD or tuberculosis
            v. Suspected Pulmonary AVM
   C. Chest Ultrasound
      1. Chest ultrasound (CPT® 76604) includes transverse, longitudinal, and
         oblique images of the chest wall with measurements of chest wall
         thickness, and also includes imaging of the mediastinum.
         b. Breast ultrasound.
D. Chest CT

1. Intrathoracic abnormalities found on chest x-ray, fluoroscopy, abdominal CT scan, or other imaging modalities may be further evaluated with chest CT with contrast (CPT® 71260).
   a. “Abnormalities” through these guidelines may include suspected lung or pleural nodules or masses, pleural effusion, adenopathy or other findings that are not considered benign.
   b. Lung nodule(s) identified incidentally on:
      i. Chest CTA without and with contrast (CPT® 71275), or
      ii. Chest MRI without contrast (CPT® 71550), or
      iii. Chest MRI without and with contrast (CPT® 71552), or
      iv. Chest MRA without and with contrast (CPT® 71555) can replace Chest CT with contrast (CPT® 71260) or chest CT without contrast (CPT® 71250) as the initial dedicated study.

2. Chest CT without contrast (CPT® 71250) can be used for the following:
   a. Patient has contraindication to contrast.
   b. Follow-up of pulmonary nodule(s).
   c. High Resolution CT (HRCT).
   d. Low-dose chest CT (CPT® G0297)

3. Chest CT without and with contrast (CPT® 71270) does not add significant diagnostic information above and beyond that provided by chest CT with contrast, unless a question regarding calcification, most often within a lung nodule, needs to be resolved.

4. High resolution chest CT should be reported only with an appropriate code from the set CPT® 71250-CPT® 71270.
   a. No additional CPT® codes should be reported for the “high resolution” portion of the scan. The “high resolution” involves additional slices which are not separately billable.

E. Chest CTA (CPT® 71275)

1. Chest CTA (CPT® 71275) can be considered for suspected Pulmonary Embolism and Thoracic Aortic disease.
   a. CTA prior to minimally invasive or robotic surgery

F. Chest MRI without and with Contrast (CPT® 71552)

1. Indications for chest MRI are infrequent and may relate to concerns about CT contrast such as renal insufficiency or contrast allergy. MRI may be indicated:
a. Clarification of some equivocal findings on previous imaging studies, which are often in the thymic mediastinal region or determining margin (vascular/soft tissue) involvement with tumor and determined on a case-by-case basis.
   i. Certain conditions include:
      01. Chest wall mass.
      02. Chest muscle tendon injuries.
      03. Brachial plexopathy.
      04. Thymoma.

G. Nuclear Medicine

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>78597</td>
<td>Quantitative differential pulmonary perfusion, including imaging when performed</td>
</tr>
<tr>
<td>78598</td>
<td>Quantitative differential pulmonary perfusion and ventilation (e.g., aerosol or gas), including imaging when performed</td>
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General Chest References


II. Lymphadenopathy

A. Supraclavicular Region
   1. Ultrasound (CPT® 76535) is the initial study for palpable or suspected lymphadenopathy.
      b. If ultrasound is indeterminate, neck CT with contrast (CPT® 70491) or chest CT with contrast (CPT® 71260) can be performed.

B. Axillary Lymphadenopathy
   1. There is no evidence-based support for advanced imaging of clinically evidenced axillary lymphadenopathy without biopsy. Most axillary adenopathy is infectious in primary care settings. Metastatic axillary involvement from a lung or chest primary is highly unusual (CT chest not often warranted).
   2. Localized axillary lymphadenopathy should prompt:
      a. Ultrasound directed core needle biopsy or surgical excisional biopsy of the most abnormal lymph node if condition persists or malignancy suspected.
      b. Search for adjacent hand or arm injury or infection, and
      c. 3-4 week observation if benign clinical picture, and
d. Excisional or ultrasound directed core needle biopsy of most abnormal lymph node if condition persists or malignancy suspected.
e. No advanced imaging indicated.

3. Generalized axillary lymphadenopathy should prompt:
   a. Ultrasound directed core needle biopsy or surgical excisional biopsy of the most abnormal lymph node if condition persists or malignancy suspected.
   b. Diagnostic work-up, including serological tests, for systemic diseases, and
   c. Excisional biopsy of most abnormal lymph node if uncertainty persists.

4. Occult Primary Cancer in axillary lymph node(s):
   a. Breast MRI (CPT® 77059) can be performed if breast cancer is suspected, and if physical exam and mammography are negative. Otherwise, imaging of other possible primary sites are led by symptomatology, and risk factors.

C. Mediastinal Lymphadenopathy
   1. Chest CT with contrast (CPT® 71260) can be performed if mediastinal abnormalities are detected on a chest x-ray (over read by a radiologist) or other non-dedicated advanced chest imaging.
      a. Follow-up chest CT (CPT® 71260) can be performed after 4 weeks if:
         i. Enlarged lymph nodes are in the mediastinum with no other thoracic abnormalities; and
         ii. Low risk or no clinical suspicion for malignancy.
         iii. Thereafter, stability does not require further advanced imaging.
      b. Further evaluations
         i. Lymph node biopsy (see methods below) should be considered for:
            01. Persistent lymphadenopathy on follow-up chest CT; or
            02. Suspected malignancy.

Lymphadenopathy References

III. Cough
   A. Initial evaluation should include a recent chest x-ray after the current episode of cough started or changed.1 2
1. Discontinue all medications known to cause coughing (e.g. ACE inhibitors).\(^1\),\(^2\)

B. If the initial chest x-ray is without abnormalities, a chest CT (either with contrast [CPT\(^\circledR\) 71260] or without contrast [CPT\(^\circledR\) 71250]) can be performed for the following:
1. Cough in non-smoker after the following sequence for a total 3 week trial and investigation (all):
   a. Antihistamine and decongestant treatment.\(^1\),\(^2\)
   b. Bronchoprovocation challenge (e.g. methacholine challenge, exhaled nitric oxide test) and spirometry should be performed to rule out asthma.\(^1\)
   c. Empiric trial of corticosteroids.\(^1\),\(^2\)
   d. Treatment of gastroesophageal reflux disease (GERD).\(^1\),\(^2\)
2. Current or past cigarette smokers with either:
   a. New cough lasting greater than 2 weeks (URI based cough can be prolonged).
   b. Changed chronic cough in worsening frequency or character
3. For any abnormalities present on the initial chest x-ray, advanced chest imaging can be performed according to the relevant Chest Imaging Guidelines section 1.

Cough References

IV. Non-Cardiac Chest Pain
A. General
1. “Evidence is not conclusive whether Triple-rule-out CT (CAD, PE, and AD) will improve efficiency of patient management” with acute chest pain.
2. MRI is not supported in the evaluation of chest pain.

B. Imaging
1. Initial evaluation should include a chest x-ray.\(^1\),\(^2\)
   a. If x-ray is abnormal, chest CT with contrast (CPT\(^\circledR\) 71260) or CTA chest with contrast (CPT\(^\circledR\) 71275) can be performed.\(^1\),\(^2\),\(^3\),\(^4\)
   b. If x-ray is normal, patient should undergo evaluation of other possible causes of pain prior to advanced imaging (CT chest with contrast or CTA chest with contrast) including,\(^1\),\(^2\),\(^3\),\(^4\)
      i. Cardiac (ECG, echocardiogram, stress test)\(^1\),\(^2\) and
      ii. GI (trial of anti-reflux medication, possible upper endoscopy, pH probe, esophageal manometry).\(^1\)
iii. Either a barium swallow, esophageal pH monitoring, manometry, or endoscopy should be done in all after cardiac causes have been ruled out since GERD is the cause in almost 60%, and

iv. Pulmonary (PFT’s).1,2

c. Chest CT with contrast (CPT® 71260) can be performed if persistent:
   i. The initial chest x-ray reveals no abnormalities; and either 01. Sickle cell disease2, or 02. Suspected lung mass in a patient with chest pain, cough, and weight loss.2

C. Costochondritis/Other Musculoskeletal Chest Wall Syndrome

1. Costochondritis or other suggested musculoskeletal chest wall syndrome does not require advanced imaging (CT or MRI) unless it meets other criteria in these guidelines.

2. Costochondritis can be readily diagnosed with palpation tenderness and/or hooking maneuver and imaging is non-specific.3

Non-cardiac Chest Pain References


V. Dyspnea/Shortness of Breath

A. Dyspnea/Shortness of Breath

1. Dyspnea is the subjective experience of breathing discomfort. Initial evaluation should include a recent chest x-ray.1, 2

a. If x-ray is abnormal, chest CT without contrast (CPT® 71250) can be performed.1, 2

b. If the initial chest x-ray is indeterminate, chest CT without contrast (CPT® 71250, including HRCT), or chest CT with contrast (CPT® 71260) can be performed if the following evaluations have been conducted and are indeterminate:2
   i. ECG, echocardiogram or stress testing,2 and
   ii. Pulse oximetry and pulmonary function studies (PFT's),2 and/or
   iii. Blood work including CBC and thyroid function tests,2 if appropriate.

B. Pre-Operative Assessment

1. “Split Function Studies” (CPT® 78597-Quantitative Differential Pulmonary Perfusion, Including Imaging When Performed or CPT® 78598-Quantitative Differential Pulmonary Perfusion and Ventilation (e.g., Aerosol or Gas), Including Imaging When Performed) can be considered for pre-operative assessment prior to planned segmental, lobar or lung removal.3, 4
Dyspnea/Shortness of Breath References

VI. Hemoptysis
A. Chest CT with contrast (CPT® 71260) OR without contrast (CPT® 71250) OR CTA chest (CPT® 71275) may be performed after:
1. Abnormal chest x-ray, or
2. No chest x-ray needed if any of the following:
   a. High risk for malignancy with >40 years of age and >30 pack-year smoking history, or
   b. Persistent/recurrent with >40 years of age or >30 pack year smoking history, or
   c. Massive hemoptysis (≥30 cc per episode or unable protect airway).¹

Hemoptysis Reference

VII. Bronchiectasis
A. High resolution chest CT scan (HRCT) without contrast (CPT® 71250).⁴, ⁵
   1. To confirm suspected diagnosis of bronchiectasis after an initial x-ray¹, ²; or
   2. For known bronchiectasis with worsening symptoms or worsening PFT's².
   3. For hemoptysis with known or suspected bronchiectasis.³

Bronchiectasis References
VIII. Bronchitis
A. Advanced imaging is not needed for bronchitis.\textsuperscript{1,2}
B. Chest x-ray to determine if any abnormality is present.

Bronchitis References

IX. Asbestos Exposure
A. Chest x-ray as radiographic screening for asbestos exposure.\textsuperscript{1,2}
   1. Stable calcified pleural plaques on chest x-ray do not require advanced imaging of the chest.\textsuperscript{2}
   2. CT of the chest should not be used to screen populations at risk for asbestos-related diseases.\textsuperscript{2}
   3. High resolution chest CT (HRCT) (CPT® 71250) is considered for:\textsuperscript{2}
      a. Any change seen on chest x-ray.
      b. Progressive respiratory symptoms that may indicate the development or progression of asbestos related interstitial fibrosis.
      c. Send requests for additional follow-up imaging to Medical Director for review.

Asbestos Exposure References

X. COPD
A. Chest x-ray should be performed initially.
   1. Chest CT without contrast (CPT® 71250) or Chest CT with contrast (CPT® 71260)\textsuperscript{1,2} can be performed if emphysema is suspected and either:
      a. Pre-operative study for Lung Volume Reduction Surgery (LVRS).\textsuperscript{1}
      b. Definitive diagnosis is not yet determined by laboratory studies and chest x-ray and one on the following is suspected:
         i. Bronchiectasis
         ii. Sarcoidosis
         iii. Emphysema
         iv. Pneumoconiosis
         v. Idiopathic pulmonary fibrosis
         vi. Langerhans cell histiocytosis
vii. Hypersensitivity pneumonitis
viii. Bronchiolitis obliterans
ix. Lipoid pneumonia
x. Drug toxicity
xi. Lymphangitic cancer

B. Lung cancer screening is discussed in the following guideline:

COPD References

XI. Interstitial Lung Disease
A. High resolution chest CT (HRCT) without contrast (CPT® 71250) is the diagnostic modality of choice to evaluate for:
B. Interstitial changes identified on other imaging (including chest x-ray) in patients with pulmonary symptoms and abnormal pulmonary function studies (PFT’S) 1-6
   1. Initial request to identify interstitial disease with a connective tissue disease diagnosis, including:
      a. Rheumatoid arthritis,
      b. Scleroderma, and
      c. The myopathies
C. As well as in occupational lung disease such as:
   1. Asbestosis,
   2. Silicosis, and
   3. Coal miner’s lung disease 1-6
D. New or worsening pulmonary symptoms or worsening PFT’s in any type of interstitial disease, including connective tissue diseases, or 1-6
   1. Once a year in patients with known idiopathic pulmonary fibrosis (IPF) if showing progression or regression of disease will change patient management

Interstitial Lung Disease References


**XII. Multiple Pulmonary Nodules**

A. The largest of multiple pulmonary nodules should be imaged based on guideline: See XVI. **Solitary Pulmonary Nodule (SPN)**

**References**


**XIII. Pneumonia**

A. Chest x-ray would be performed initially in all patients with suspected pneumonia, prior to considering advanced imaging.1, 2

1. Chest CT with contrast (CPT® 71260) if initial or repeat chest x-ray findings reveal:
   a. Complication of pneumonia (e.g. abscess, effusion, hypoxemia, respiratory distress, necrotizing pneumonia, pneumothorax).1, 2
   b. Possible lung mass associated with the infiltrate.2

**Pneumonia References**


XIV. Other Chest Infections

A. PPD or TB

1. Chest CT with contrast (CPT® 71260) is appropriate for individuals with:
   a. Positive PPD skin test or other positive tuberculin skin tests and normal chest x-ray who have not had a previous normal chest CT, or
   b. Clinical evidence of active tuberculosis or reactivated tuberculosis.\(^\text{10}\)
   c. Suspected complications or progression of tuberculosis (e.g. pleural tuberculosis, empyema, and mediastinitis).
      i. If chest CT is unremarkable, there is insufficient data to support performing subsequent chest CT unless symptoms develop or chest x-ray shows a new abnormality.
      ii. Follow-up chest CT with contrast (CPT® 71260) with frequency at the discretion of the pulmonary specialist (not to exceed 3 studies in 3 months).
   d. Re-evaluate individuals undergoing active treatment for tuberculosis who had abnormalities seen only on chest CT.

B. Fungal Infections

1. Chest CT with contrast (CPT® 71260) or High resolution chest CT (HRCT) without contrast (CPT® 71250) is appropriate for individuals with:\(^\text{3,4}\)
   a. Initial diagnosis of any fungal pneumonia or chest infection.\(^\text{3,4}\)
   b. Suspected complications or progression of the fungal chest infection (e.g. worsening pneumonitis; pleural effusion, empyema, mediastinitis).
2. Follow-up chest CT with contrast (CPT® 71260) or High resolution chest CT (HRCT) without contrast (CPT® 71250) with frequency at the discretion of the pulmonary specialist.

C. Wegener's Granulomatosis/Granulomatosis with Polyangiitis

1. Chest CT without contrast (CPT® 71250)* should be done in all patients who have pulmonary symptoms and are suspected of having an Antineutrophil cytoplasmic autoantibody (ANCA)-associated vasculitides (AAV) either when:\(^\text{5,6}\)
   a. Newly diagnosed, or \(^\text{5,6}\)
   b. Baseline prior to initiating immunosuppressive therapy.\(^\text{5,6}\)

D. Suspected Sternal Dehiscence

1. Sternal wound dehiscence is primarily a clinical determination.
   a. Chest x-ray is performed prior to advanced imaging to identify abnormalities in the sternal wire integrity and/or a midsternal stripe. Other findings include rotated, shifted or ruptured wires.
   b. CT chest without contrast can be considered if there is planned debridement and/or repair.
Other Chest Infection References


XV. Sarcoid

A. Chest CT either with contrast (CPT® 71260) or without contrast (CPT® 71250) is appropriate for the following:1
   1. Establish or rule out the diagnosis when suspected,
   2. Development of worsening symptoms,
   3. New symptoms appear after a period of being asymptomatic, or
   4. Treatment change is being considered in known sarcoid.
   a. If CT is equivocal, definitive diagnosis can only be made by biopsy.2,3,4

B. There is currently no evidence-based data to support performing serial PET scans to monitor disease activity while tapering steroid therapy.2,3,4

Sarcoid References


XVI. Solitary Pulmonary Nodule (SPN) Imaging

A. Chest CT with contrast (CPT® 71260) or chest CT without contrast (CPT® 71250) (with contrast is preferred for initial evaluation) can be performed for discrete nodule(s) in the following scenarios:1,2,3

1. Lung nodule(s) seen on an imaging study other than a "dedicated" chest CT or MR. Examples of other studies:
   b. Abdominal CT.
   c. Spine MRI.
   d. Coronary CTA

2. Lung nodule(s) identified incidentally on any of the following dedicated chest studies can replace Chest CT with contrast (CPT® 71260) or Chest CT without contrast (CPT® 71250) as the initial dedicated study
   a. Chest CT without and with contrast (CPT® 71270).
   b. Chest CTA without and with contrast (CPT® 71275).
   c. Chest MRI without contrast (CPT® 71550).
   d. Chest MRI without and with contrast (CPT® 71552).
   e. Chest MRA without and with contrast (CPT® 71555).

3. Comparisons should include the earliest available study and the more recent previous chest CT scans to determine if nodule was present and stable.1 Using largest measurement of multiple lung nodules.1
   a. Similar-sized pleural nodule(s) is treated as a pulmonary nodule(s)

B. Incidental Pulmonary Nodules Detected on CT Images

<table>
<thead>
<tr>
<th>SOLID NODULE SIZE (mm)*</th>
<th>CHEST CT INTERVAL (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6</td>
<td>Follow-up at 12; if unchanged, no further follow-up1</td>
</tr>
<tr>
<td>6-8</td>
<td>Follow-up at 6-12**; then at 18-24 (complete to 24)1 **if multiple nodules first interval at 3-6; then at 18-24 (complete to 24)1</td>
</tr>
<tr>
<td>&gt;8</td>
<td>Follow-up at 3-6, 18-24, consider PET or biopsy1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBSOLID NODULE SIZE (mm)</th>
<th>CHEST CT INTERVAL (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6</td>
<td>Follow-up at 2 and 4 years1</td>
</tr>
<tr>
<td>&gt;/= 6</td>
<td>Follow-up at 6-12; then annually for 5 years1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUND GLASS SIZE (mm)</th>
<th>CHEST CT INTERVAL (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6</td>
<td>Follow-up at 2 and 4 years1</td>
</tr>
<tr>
<td>&gt;/= 6</td>
<td>Follow-up at 6-12; then annually for 5 years1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL SITUATIONS</th>
<th>CHEST CT INTERVAL (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative PET</td>
<td>&gt;/= 6 months after PET, and complete to 24 from the first CT Chest (2, Figure 1, 4,5 )</td>
</tr>
<tr>
<td>Previous or current malignancy and pulmonary nodule(s) that would reasonably metastasize to the lungs</td>
<td>See ONC-31.1: Lung Metastases</td>
</tr>
</tbody>
</table>
*Following the Fleischner Society Guidelines for high risk which include American College of Chest Physicians intermediate and high risk categories.1, 2

C. Interval Imaging Outcomes
1. No further advanced imaging is necessary if a nodule has been
   a. Stable for 2 years
      i. Nodules(s) stable on chest x-ray.
      ii. Nodule(s) ≥ 6mm stable on CT chest.¹
   b. Stable for 1 year
      i. Nodule(s) < 6mm.¹
   c. At any time, if:
      i. Classically benign characteristics by chest x-ray or previous CT (e.g. benign calcification pattern typical for a granuloma or hamartoma).
      ii. Decreasing or disappearing nodule(s).³
   d. Lung nodule(s) which increases in size or number should no longer be considered for CT screening or surveillance, including resetting the 2 year Fleishner interval based on a new size, since stability drives screening or surveillance.¹²³⁷
   e. Instead, with an increasing nodule or number, PET (see below). Tissue sampling or other further diagnostic investigations should be considered.

D. PET
1. PET/CT (CPT® 78815) is appropriate for a distinct lung nodule ≥ 8 mm on chest CTA or MRA.
   a. If there is a history of malignancy, refer to the appropriate Oncology restaging/recurrence guideline for indications for PET imaging.
      i. See Pleural nodule see CH-17.1: Pleural-Based Nodules and Other Abnormalities.
   b. Serial PET studies are not considered appropriate.
   c. Not appropriate for infiltrate, ground glass opacity, or hilar enlargement.

Solitary Pulmonary Nodule (SPN) Imaging References
XVII. Pleural-Based Nodules and Other Abnormalities
A. Chest CT with contrast (CPT® 71260) or chest CT without contrast (CPT® 71250) (with contrast is preferred for initial evaluation) can be performed for pleural nodule(s).1
B. Pleural nodule(s) seen on an imaging study other than a “dedicated” chest CT or MR.1
C. Pleural nodule(s) identified incidentally on any of the following dedicated chest studies can replace Chest CT as the initial dedicated study.1
D. After preliminary comparison with any available previous chest films to determine presence and stability.
   1. Using largest measurement of multiple nodule(s).
   2. Following the Fleischner Society Guidelines for high risk.
E. PET can be considered if dedicated CT or MRI Chest identifies a pleural nodule/mass or defined area of pleural thickening that is >8 mm when there is a likelihood of malignancy including current or previous malignancy, pleural effusion, bone erosion, chest pain.1

Pleural-Based Nodules and Other Abnormalities Reference

XVIII. Pleural Effusion
A. Chest CT with contrast (CPT® 71260) can be performed after both:1,2
   1. Chest x-ray including lateral decubitus films; and
   2. Thoracentesis to determine if fluid is exudative or transudative and remove as much as possible (this fluid can obscure the underlying lung
B. Chest ultrasound (CPT® 76604) can be used as an alternative to chest x-ray to evaluate for the presence of fluid within parenchyma and possibly a mass, the pleural spaces and guide thoracentesis.

Pleural Effusion References
XIX. Pneumothorax/Hemothorax

A. Pneumothorax/Hemothorax
   1. Chest x-ray should be performed initially.
      a. Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250)
         if:
            b. Diagnosis of a small pneumothorax is in doubt, and the presence of a
               pneumothorax will affect patient treatment decisions.1
            c. Preoperative study for treatment of pneumothorax.1
            d. Pneumothorax associated with hemothorax.2
            e. Suspected complications from hemothorax (e.g. empyema).2
            f. Suspected Alpha-1-Antitrypsin Deficiency (even without
               pneumothorax).3

B. Pneumomediastinum; Subcutaneous Emphysema
   1. Chest x-ray should be performed initially.
      a. Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250)
         if:
            i. Recent vomiting and/or suspected esophageal perforation.4,5
            ii. Associated pneumopericardium.4,5
            iii. Associated pneumothorax.4,5
            iv. Preoperative study for treatment.4,5

Pneumothorax/Hemothorax References

XX. Mediastinal Mass

A. Chest CT with contrast (CPT® 71260) is the imaging study of choice to evaluate mediastinal abnormalities seen on chest x-ray or other non-dedicated chest imaging and can be done once initially if there is a concern for:1,2,3
   1. Mediastinal cyst including bronchogenic, thymic, pericardial or esophageal
      in nature.

B. Subsequent evaluations either with CT Chest or MRI Chest can be performed for:
   1. New signs or symptoms, or
   2. Preoperative assessment.
XXI. Chest Trauma

A. Chest X-ray should be performed initially.
   1. Chest CT without contrast (CPT® 71250) or with contrast (CPT® 71260) is appropriate for the following situations:¹
      a. Rib 1 or Sternal 2 Fracture:
         i. With associated complications identified clinically or by other imaging, including pneumothorax, hemothorax, pulmonary contusion, atelectasis, flail chest, cardiovascular injury and/or injuries to solid or hollow abdominal organs.¹
         ii. Uncomplicated, single fractures, multiple fractures, non-acute fractures, or occult rib fractures are NOT an indication for chest CT unless malignancy is suspected as the etiology.¹
      b. Routine follow-up advanced imaging of rib or sternal fractures is not indicated.¹
         i. Suspected Pathological Rib Fractures should undergo CT Chest without contrast (71250) or Tc-99m bone scan whole body.¹
         ii. Clavicle Fractures:
            01. Proximal (medial) 1/3 fractures or sternoclavicular dislocations can undergo Computed tomography (CT) and magnetic resonance imaging of the chest or shoulder.³
            02. X-ray is adequate for evaluation of middle and distal 1/3 fractures.³
   B. No advanced imaging of the abdomen or pelvis is indicated when there is chest trauma and no physical examination or laboratory evidence of abdominal and/or pelvic injury.

References

XXII. Chest Wall Mass

A. Chest x-ray is useful in the workup of a soft-tissue mass and are almost always indicated as the initial imaging study.¹

1. Chest ultrasound (CPT® 76604) may be useful as an initial imaging study in the setting of a suspected superficial or subcutaneous lipoma. This modality may also be valuable in differentiating cystic from solid lesions and has also been used to assess the vascularity of lesions.¹

2. Chest CT with contrast (CPT® 71260) or chest CT without contrast (CPT® 71250) or MRI chest without and with contrast (CPT® 71552) or MRI chest without contrast (CPT® 71550) can be considered when the following are met:¹,²

   a. Chest x-ray completed and does not demonstrate any of the following:
      i. Obvious lipomas¹
      ii. Clearly benign entity¹
      iii. No mass identified (radiographically or palpated).¹

Chest Wall Mass References


XXIII. Pectus Excavatum and Pectus Carinatum

A. Chest CT without contrast (CPT® 71250) or MRI chest without and with contrast (CPT® 71552) and 3-D reconstruction (CPT® 76377) if requested can be considered if:

1. Candidates for surgical correction.¹,²

   a. Cosmetic repairs requests without physiological disability or severe deformities may not meet certain payers policies.

2. Cardiac or pulmonary dysfunction has been identified¹,²

   a. ECG and echocardiography are indicated if there are cardiac symptoms or evidence of cardiac function abnormalities.

   b. Chest x-ray and PFT’s are indicated if there is increasing shortness of breath.¹

B. Chest measurements derived from Chest CT, such as the Haller Index, are helpful to the thoracic surgeon in pre-operative assessment of chest wall deformities to assess for the appropriateness of operative repair prior to the development of symptomatic precuts deformities.

Pectus Excavatum and Pectus Carinatum References


XXIV. Pulmonary Arteriovenous Fistula (see CTA Chest; MRA Chest)
XXV. Pulmonary Embolism (See CTA Chest)

XXVI. Pulmonary Hypertension

A. Pulmonary artery hypertension (PAH) comprises a spectrum of diseases which will direct evaluation, including ECG (right ventricular hypertrophy with / without strain, right atrial dilatation); chest x-ray; arterial blood gas, PFT's or V/Q scan. Imaging is based on etiology

1. Transthoracic echocardiogram (TTE) (CPT® 93306) initially, accompanied by:
2. Pulmonary venous hypertension - Stress echocardiogram (CPT® 93350 or CPT®93351) or left heart catheterization.
3. Pulmonary hypertension associated with hypoxemia - High resolution chest CT Chest (CPT® 71250) to rule out restrictive lung disorders such as idiopathic pulmonary fibrosis.
4. Acute or chronic pulmonary embolism – Chest CTA Chest (CPT® 71275);

Pulmonary Hypertension References


XXVII. Subclavian Steal (See CTA Chest; MRA Chest)

XXVIII. SVC Syndrome

A. Chest CT with contrast (CPT® 71260) is the initial imaging studies of choice for the evaluation of suspected SVC syndrome based on the facial cyanosis and UE swelling without anasarca.1,2

1. MRV (CPT® 71555) or CTV (CPT® 71275) of the chest may be indicated when stenting of the SVC is being considered.1,2

SVC Syndrome References


XXIX. Thoracic Aorta (See CTA Chest)
XXX. Elevated Hemidiaphragm

A. Chest CT with contrast (CPT® 71260) and neck CT with contrast (CPT® 70491) (if requested) with new diaphragmatic paralysis after.\textsuperscript{1,2}

1. Previous chest x-rays are available and reviewed to determine if the diaphragmatic elevation is a new finding, and/or
2. Fluoroscopic examination (“sniff test”) to differentiate true paralysis from weakness.
3. CT abdomen with contrast (CPT® 74160) to rule out liver or abdominal process if Chest CT is negative.\textsuperscript{1,2}
4. Repeat advanced imaging studies in the absence of new signs or symptoms are not indicated.

References

XXXI. Thoracic Outlet Syndrome (See MRA Chest)

XXXII. Newer Imaging Techniques

A. Virtual Bronchoscopy

1. There is insufficient data currently available to generate appropriateness criteria for the use of virtual bronchoscopy, and this procedure should be considered investigational at this time.\textsuperscript{1}
2. Virtual bronchoscopy uses multidetector CT with 3D rendering (CPT® 71260 and CPT® 76377) to generate an image of the tracheobronchial tree down to the level of the sixth- to seventh-generation bronchi, and can visualize areas inaccessible to the flexible bronchoscope.\textsuperscript{1}

B. Navigational/EM–Guided Peripheral Bronchoscopy

1. EM Guided Peripheral Bronchoscopy is not a covered benefit for all health plans.
   a. Peripheral bronchoscopy technology uses electromagnetic (EM) navigational guidance with a CT road map for performing biopsies of peripheral lung lesions.\textsuperscript{2}
   b. Supplemental imaging See Preface-4.3.
   c. Planning is included in the navigational bronchoscopy code (CPT® 31627).
   d. Neither separate unlisted codes, (CPT® 76499 or CPT® 76497), nor other diagnostic CT codes should be reported for the planning phase and pre-procedure imaging acquisition.
   e. 3D Rendering, (CPT® 76376 and CPT® 76377), is not reported in conjunction with CPT® 31627.
Newer Imaging Techniques References


XXXIII. Lung Transplantation

A. Pre-Transplant Imaging Studies

1. Individuals on the waiting list or being considered for the lung transplant can undergo advanced imaging per that institution’s protocol as long as the studies do not exceed the following:
   a. Chest CT with and without contrast (CPT® 71270), chest CT with (CPT® 71260), or chest CT without contrast (CPT® 71250),
   b. ECHO
      i. Imaging Stress Test (MPI, SE, MR) or Heart Catheterization (Right and Left); Heart catheterization can also be done after a positive stress test.
      ii. Other studies that will be considered include V/Q scan, Six Minute Walk Test.
      iii. Initial post-transplant follow-up: CT chest with and without contrast (CPT® 71270), CT chest with (CPT® 71260), or CT chest without contrast (CPT® 71250).
   iv. Requests for subsequent follow-up imaging will go to Medical Director review.

Lung Transplantation Reference


XXXIV.

A. Recurrent Laryngeal Nerve (Vocal cord) Palsy The following can be considered with unilateral vocal cord/fold palsy identified by laryngoscopy1

B. MRI Head without and with contrast (CPT® 70553) or MRI Head without contrast (CPT® 70551)

C. CT Neck with contrast (CPT® 70491) or MRI Neck without and with contrast (CPT® 70543)

D. CT Chest with contrast (CPT® 71260) may be added with left vocal cord palsy.
XXXV.  **Brachial Plexus**

Brachial plexus studies can be coded either as upper extremity other than joint MRI without or without and with contrast (CPT® 73218 or CPT® 73220), Chest MRI without or without and with contrast (CPT® 71550 or CPT® 71552) or Neck MRI without (CPT® 70540) or without and with contrast (CPT® 70543) (if upper trunk) after EMG/NCV examination for:

A. Malignant infiltration (EMG not required)
B. Radiation plexitis to r/o malignant infiltration
C. Brachial plexitis (Parsonage-Turner Syndrome or painful brachial amyotrophy).
   1. Self-limited syndrome characterized by initial shoulder region pain followed by weakness of specific muscles in a pattern which does not conform to involvement of a single root or distal peripheral nerve
   2. Consider MRI of the cervical spine if radiculopathy.
D. Traumatic injury
E. Neurogenic Thoracic Outlet Syndrome (TOS) failed a 2 to 3 month trial of conservative management and are being considered for surgical treatment.
F. Preoperative study which requires evaluation of the brachial plexus

**Brachial Plexus References**


XXXVI.  **Myasthenia Gravis**

A. Neuromuscular Disease
   1. Myasthenia Gravis (MG) is associated with thymic disease and can undergo:
      a. Chest CT with contrast (CPT® 71260) after an established diagnosis of MG.
i. Can be repeated if initial CT previously negative and now symptoms of chest mass, rising anti-striated muscle antibody titers, or need for preoperative evaluation (clinical presentation, electro-diagnostic studies, and antibody titers).

b. Chest CT without contrast (CPT® 71250) may be used if there is concern regarding adverse effects of contrast in patients with MG.

B. Lambert–Eaton myasthenic syndrome (LEMS) is associated with small cell lung cancer and can undergo:
   1. Chest CT with contrast (CPT® 71260) with a suspected diagnosis (CXR, symptoms of lung mass, clinical presentation, electro-diagnostic studies, and antibody titers).
   2. Can be repeated if initial CT previously negative after 3 months with persistent suspicion.

C. Stiff man syndrome is associated with small cell lung cancer and breast cancer
   1. Chest CT with contrast (CPT® 71260) if Stiff Man Syndrome is suspected based on clinical findings.

XXXVII. Cystic fibrosis [One of the following]
   A. Hemoptysis
   B. Respiratory distress
   C. Spontaneous pneumothorax
   D. Acute onset chest pain
   E. Inspiratory rales or crackles
   F. Bronchiectasis
   G. Chronic or recurrent respiratory infections

XXXVIII. Paraneoplastic syndrome suspicious for lung cancer
   Chest CT with contrast (CPT® 71260) in a smoker (past or present) or non-smoker (after chest x-ray) and one of the following:
   A. SIADH (syndrome of inappropriate ADH)
      1. Decreased serum sodium (less than 125 mmol/l)
   B. Hypertrophic Pulmonary Osteoarthropathy: Often presents as a constellation of rheumatoid-like polyarthritis, periostitis of long bones, and clubbing of fingers and toes
   C. Amyloidosis
   D. Hypercalcemia
   E. Hypophysphatemia
   F. Cushing’s Syndrome
   G. Somatostatinoma syndrome (vomiting, abdominal pain, diarrhea, cholelithiasis)
   H. Polymyositis/dermatomyositis
   I. Opsoclonus
   J. Paraneoplastic sensory neuropathy
   K. Subacute cerebellar degeneration
   L. Eaton-Lambert syndrome (a myasthenia-like syndrome)
   M. Second event of unprovoked thrombosis
N. Disseminated Intravascular Coagulation
O. Migratory thrombophlebitis
P. Polycythemia
Q. Chronic leukocytosis and/or thrombocytosis
R. Carcinoid syndrome
S. Glomerulonephritis
T. Stiff man syndrome is associated with small cell lung cancer and breast cancer

XXXIX. Fever of unknown origin (FUO)\textsuperscript{19,20} with documented temperature of \(>38.3°C\) or \(>100.9°F\) on several occasions over 3 weeks
CT scans for this indication have a low yield in general and CT of the chest is generally not recommended
A. Uncertain diagnosis after lab studies [All of the following]
   1. Three blood cultures
   2. Urine culture not diagnostic
   3. Tuberculin skin test
   4. HIV antibody assay and HIV viral load for patients at high risk
   5. Negative chest x-ray
B. Night sweats

XL. Weight loss of \(5%\) of total body weight or 10 pounds or more\textsuperscript{24,25}
A. CT chest with contrast (CPT\textsuperscript{®} 71260) in a smoker (past or present) or non-smoker (after chest x-ray)
B. Note that CT scans for this indication have a low yield

XL I. Horner’s syndrome\textsuperscript{29}

XL II. Dysphagia (See CT Neck)

XL III. Evaluation of possible metastatic disease to the lungs and surveillance of asymptomatic individuals with no known metastatic disease
CT chest with contrast (CPT\textsuperscript{®}71260) or CT chest without contrast (CPT\textsuperscript{®}71250) may be obtained to evaluate for lung primary or metastases.
A. For evaluation of nodules suspected to be primary lung cancer, see IVB, XXXII and XXXIII
B. For evaluation of suspected lung metastases in a patient with known malignancy, see individual cancer criteria (XXVII to LXIV)
C. Asymptomatic with history of malignancy, that would reasonably metastasize to the lungs
   1. CT chest with contrast (CPT\textsuperscript{®}71260) or CT chest without contrast (CPT\textsuperscript{®}71250) at 3, 6, 12 and 24 months from the first study
   2. CT chest with contrast (CPT\textsuperscript{®}71260) may also be obtained sooner for one of the following:
      a. New pulmonary signs or symptoms
      b. New chest x-ray abnormalities
XLIV. Squamous cell carcinoma of Head and neck

Squamous cell carcinoma of the head and neck can arise from various sites, including but not limited to, lip, oral cavity, oropharynx, hypopharynx, nasopharynx, glottis, supraglottic larynx, ethmoid or maxillary sinus or an occult primary.

A. Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
   1. Initial staging
   2. Recurrence suspected, based on one of the following
      a. Biopsy proven or suspected local recurrence
      b. Prior involvement of the lungs
      c. New pulmonary signs or symptoms
      d. New chest x-ray findings
   3. Surveillance
      a. CT chest is not indicated for routine asymptomatic surveillance or after completion of planned chemotherapy and/or radiation therapy.
      b. If lung nodules are present, follow IV.B.3
      c. If criteria for low dose CT chest for lung cancer screening are met, follow XXV and XXVI

XLV. Thyroid Cancer

Thyroid cancer can present with various histologies – papillary, follicular, medullary, Hurthle cell and anaplastic thyroid cancer.

Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:

A. Initial staging and any one of the following:
   1. Any histology with substernal extension of the thyroid mass
   2. Any histology with abnormal chest x-ray
   3. Any histology with pulmonary signs or symptoms
   4. Medullary thyroid cancer with one of the following:
      a. Positive lymph nodes
      b. Calcitonin level >500 pg/mL
   5. Anaplastic thyroid cancer

B. Recurrence suspected based on one of the following:
   1. Signs and symptoms of local recurrence
   2. Medullary carcinoma with elevated calcitonin or CEA
   3. New pulmonary signs or symptoms
   4. New chest x-ray findings

C. Surveillance
   1. Anaplastic thyroid cancer – CT chest every 3 months for 2 years
   2. CT chest is not indicated for routine asymptomatic surveillance for all other histologies

XLVI. Salivary Gland Cancer

Chest CT with contrast (CPT® 71260) may be obtained for one of the following:

A. Initial staging and any one of the following:
1. Lymphadenopathy in the neck
2. Abnormal chest x-ray
3. Pulmonary signs or symptoms

B. Suspected recurrence based on one of the following:
   1. Biopsy proven or suspected local recurrence
   2. New pulmonary signs or symptoms
   3. New chest x-ray findings

C. Surveillance - CT chest is not indicated for routine asymptomatic surveillance

XLVII. **Thymic carcinoma**

   Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
   
   A. Initial staging or history of mediastinal mass
   B. Suspected recurrence based on new symptoms or new chest x-ray findings
   C. Surveillance
      1. Every 6 months for 2 years
      2. Annually for 5 years for thymic carcinoma

XLVIII. **Non-small Cell Lung Cancer**

   Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:
   
   A. Suspected diagnosis
      1. Abnormal chest x-ray findings
      2. High clinical suspicion despite a normal chest x-ray
      3. For follow up of pulmonary nodules, see IVB
   B. Initial staging
   C. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known measurable disease
   D. At the completion of planned chemotherapy and/or radiation therapy to establish a new post-treatment baseline
   E. Suspected recurrence based on one of the following:
      1. New symptoms or
      2. New abnormalities noted on chest x-ray or other imaging
      3. Rising CEA
   F. Surveillance
      1. Stage I and II – CT chest every 6 months for 2 years, and then annually
         a. Patients treated with radiation therapy and residual abnormality on imaging may undergo CT chest every 3 months for the first year, every 6 months in year 2 and annually thereafter
      2. Stage III and IV – CT Chest every 3 months for 2 years, then every 6 months for 3 years, and annually thereafter

XLIX. **Small Cell Lung Cancer**

   Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:
   
   A. Suspected diagnosis
      1. Abnormal chest x-ray findings
      2. High clinical suspicion despite a normal chest x-ray
3. For follow up of pulmonary nodules, see IVB
B. Initial staging
C. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known measurable disease
D. At the completion of planned chemotherapy and/or radiation therapy to establish a new post-treatment baseline
E. Suspected recurrence based on one of the following:
   1. New symptoms
   2. New abnormalities noted on chest x-ray or other imaging
   3. Rising CEA
F. Surveillance – every 4 months for the 2 years, then every 6 months for 3 years, and annually thereafter

L. **Malignant Mesothelioma**
   Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
   Malignant Pleural Mesothelioma:
   A. Initial staging
   B. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known measurable disease
   C. At the completion of planned chemotherapy and/or radiation therapy to establish a new post-treatment baseline
   D. Prior to surgical resection
   E. Suspected recurrence based on one of the following:
      1. New symptoms
      2. New abnormalities noted on chest x-ray or other imaging
   F. Surveillance – every 3 months for 2 years, and annually thereafter
   Primary Peritoneal Mesothelioma:
   G. Initial staging
   H. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known measurable pulmonary disease
   I. Suspected recurrence based on one of the following:
      1. New symptoms
      2. New abnormalities noted on chest x-ray or other imaging
      3. Surveillance – CT chest is not indicated for routine asymptomatic surveillance

LI. **Neuroendocrine tumors (low-grade)**
   Neuroendocrine tumors (NET) can arise from gastrointestinal, lung, thymus, pancreatic or adrenal primary sites and may have elevation of various tumor markers such as chromogranin A, 5HIAA, insulin, VIP, glucagon, gastrin, substance P, serotonin, somatostatin.
   Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:
   A. Bronchopulmonary carcinoid or thymic NET
      1. Initial staging
      2. Monitoring response to treatment for unresectable or metastatic disease:
a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
b. Patients receiving somatostatin analogues – every 3 months

3. Suspected recurrence based on one of the following:
   a. New symptoms
   b. New abnormalities noted on chest x-ray or other imaging
   c. Rising tumor markers

4. Surveillance – CT chest once at 3-12 months post resection and then annually for 10 years

B. Gastric/duodenal/jejunal/ileal/appendiceal/colon/rectal/pancreatic NET
   1. Initial staging
   2. Suspected recurrence based on one of the following:
      a. New symptoms
      b. New abnormalities noted on chest x-ray or other imaging
      c. Rising tumor markers
   3. Surveillance – CT chest is not indicated for routine asymptomatic surveillance

C. Pheochromocytoma/paraganglioma
   1. Initial staging
   2. Suspected recurrence based on one of the following:
      a. New symptoms
      b. New abnormalities noted on chest x-ray or other imaging
      c. Rising tumor markers
   3. Surveillance – CT chest is not indicated for routine asymptomatic surveillance

D. Adrenocortical carcinoma
   1. Initial staging
   2. Suspected recurrence based on one of the following:
      a. New symptoms
      b. New abnormalities noted on chest x-ray or other imaging
      c. Rising tumor markers
   3. Surveillance – CT chest is not indicated for routine asymptomatic surveillance

II. Extrathoracic Small Cell Carcinoma (High grade Neuroendocrine carcinoma)
   Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
   A. Initial staging
   B. Monitoring response to chemotherapy for unresectable or metastatic disease every 2 cycles (6 to 8 weeks)
   C. Suspected recurrence based on one of the following:
      1. New symptoms
      2. New abnormalities noted on chest x-ray or other imaging
D. Surveillance – CT chest every 3 months for 1 year, then every 6 months for 4 additional years and then annually thereafter

LIII. Esophageal cancer

Chest CT with contrast (CPT® 71260) may be obtained for one of the following:

A. Initial staging
B. After preoperative or definitive chemoradiation
C. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known measurable pulmonary disease
D. Suspected recurrence based on one of the following:
   1. New signs or symptoms
   2. New abnormalities noted on chest x-ray or other imaging
   3. Biopsy proven recurrence on follow up endoscopy
E. Surveillance
   1. Stage 0 - I – no routine advanced imaging is indicated
   2. Stage II - III – every 6 months for 3 years
   3. Stage IV with measurable pulmonary metastases – every 3 months for 5 years

LIV. Gastric cancer

Chest CT with contrast (CPT® 71260) may be obtained for one of the following:

A. Initial staging
B. After completion of neoadjuvant chemotherapy for presumed surgically resectable disease
C. After completion of curative chemoradiation
D. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known measurable pulmonary disease
E. Suspected recurrence based on one of the following:
   1. New signs or symptoms
   2. New abnormalities noted on chest x-ray or other imaging
   3. New liver lesions and primary site controlled
F. Surveillance
   1. Stage I (treated with resection alone) – CT chest is not indicated for routine asymptomatic surveillance
   2. Stage I (treated with systemic therapy) – Annually for 5 years
   3. Stage II-III – Annually for 5 years
   4. Stage IV – Post definitive treatment of all measurable metastatic disease or being observed off therapy – Annually for 5 years

LV. Hepatoma or hepatocellular carcinoma

Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:

A. Initial staging
B. After resection or local therapy
C. Monitoring response to treatment for unresectable or metastatic disease:
   1. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   2. Patients receiving immunotherapy – every 3 months

D. Suspected recurrence based on one of the following:
   1. New pulmonary signs or symptoms
   2. New abnormalities noted on chest x-ray or other imaging
   3. New liver lesions

E. While awaiting liver transplant – every 6 months and immediately prior to liver transplant

F. Surveillance – every 3 months for 2 years, and then annually

LV. Gallbladder cancer and Cholangiocarcinoma
   Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:
   A. Initial staging
   B. Suspected recurrence based on one of the following:
      1. New pulmonary signs or symptoms
      2. New abnormalities noted on chest x-ray or other imaging
   C. Surveillance – CT chest is not indicated for routine asymptomatic surveillance

LVII. Pancreatic cancer
   Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
   A. Initial staging
   B. After completion of neoadjuvant chemotherapy and/or radiation therapy
   C. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known unresected/metastatic disease
   D. Suspected recurrence based on one of the following:
      1. New signs or symptoms
      2. New abnormalities noted on chest x-ray or other imaging
      3. Rising tumor markers or LFTs
   E. Surveillance
      1. Chest x-ray every 3 months for 2 years then annually
      2. CT Chest for any new pulmonary signs, symptoms or chest x-ray abnormalities

LVIII. Colon cancer
   Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
   A. Initial staging
   B. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known metastatic or unresected primary disease
   C. Suspected recurrence based on new symptoms or rising CEA or LFTs
   D. Surveillance
      1. Stage I – no routine advanced imaging is indicated
      2. Stage II-III – CT Chest annually for 5 years
      3. Stage IV – CT Chest every 6 months for 2 years and then annually for 3 years
LIX. Rectal cancer
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging
B. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks) for known metastatic or unresected primary disease
C. Suspected recurrence based on new symptoms or rising CEA or LFTs
D. Surveillance
   1. Stage I – no routine advanced imaging is indicated
   2. Stage II-III – CT Chest annually for 5 years
   3. Stage IV – CT Chest every 6 months for 2 years and then annually for 3 years

LX. Anal cancer
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging
B. Suspected recurrence based on new symptoms, elevated LFTs, or biopsy-proven recurrence
C. Surveillance one for Stage 3 or greater - annually for 3 years

LXI. Bone cancers
Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:
A. Osteosarcoma
   1. Initial staging
   2. Restaging after completion of neoadjuvant chemotherapy
   3. Restaging during post-operative chemotherapy
      a. Measurable pulmonary metastases – every 6 weeks
      b. No measurable pulmonary metastases – every 4 months
   4. At the end of chemotherapy to establish post-treatment baseline
   5. Surveillance
      a. Localized osteosarcoma – CT chest every 3 months for 1 year, then every 4 months for 1 year after completion of all therapy. Chest x-ray may be used beyond 2 years
      b. Metastatic or recurrent osteosarcoma – every 3 months for 1 year, then every 4 months for 2 years, then every 6 months for 1 year, then annually for 2 years after completion of all therapy
B. Ewing’s sarcoma
   1. Initial staging
   2. Restaging after completion of neoadjuvant chemotherapy
   3. Restaging during post-operative chemotherapy
      a. Measurable pulmonary metastases – every 6 weeks
      b. No measurable pulmonary metastases – every 3 months
   4. At the end of chemotherapy to establish post-treatment baseline
   5. Surveillance
      a. Localized Ewing’s sarcoma –
i. CT Chest with (CPT®71260) or without contrast (CPT®71250) every 3 months for 1 year then every 4 months for 1 year after completion of all therapy

ii. Chest X-ray (CXR) should be used for pulmonary recurrence surveillance after 24 months, and CT Chest can be approved to clarify inconclusive CXR findings

b. Recurrent or metastatic Ewing’s sarcoma – CT Chest with (CPT®71260) or without contrast (CPT®71250) every 3 months for 1 year then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years after completion of all therapy

C. Chondrosarcoma
   1. Initial staging
   2. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks)
   3. Surveillance
      a. Low grade and intracompartmental
         i. Chest x-ray every 6 to 12 months for 2 years then annually
         ii. CT Chest for any new signs, symptoms, or chest x-ray abnormalities
      b. High grade (grade II, grade III or clear cell or extracompartmental)
         i. CT Chest every 6 months for 5 years then annually

D. Chordoma
   1. Initial staging
   2. Surveillance
      a. Chest x-ray every 6 months for 5 years then annually until year 10
      b. CT Chest for any new signs, symptoms, or chest x-ray abnormalities

E. Giant cell tumor
   1. Initial staging
   2. Surveillance
      a. Chest x-ray every 6 months for 5 years then annually until year 10
      b. CT Chest for any new signs, symptoms, or chest x-ray abnormalities

LXII. Soft tissue sarcoma

Sarcoma may present with any of the following histologies: Myxoid/round cell liposarcoma, epithelioid sarcoma, angiosarcoma, leiomyosarcoma, endometrial stromal sarcoma, rhabdomyosarcoma, clear cell sarcoma, hemangiopericytoma and undifferentiated sarcoma.

   Chest CT with contrast (CPT® 71260) may be obtained for one of the following:

A. Sarcoma arising from extremity, trunk, head/neck primary site:
   1. Initial staging
   2. Monitoring response to chemotherapy for known metastatic disease - every 2 cycles (6 to 8 weeks)
   3. Local or systemic recurrence – biopsy proven or clinically suspected based on new signs, symptoms or chest x-ray abnormalities
   4. Surveillance - may be with CT Chest with contrast (CPT® 71260) or without contrast (CPT®71250)
      a. Stage I, low grade sarcoma
i. Chest x-ray every 6 months for 2 years, then annually until year 10
ii. CT Chest for any of the following:
   01. New/worsening pulmonary signs/symptoms
   02. New chest x-ray abnormalities
b. Stage II-IV sarcoma
   i. CT chest every 3 months for 2 years, then every 6 months for 2 more years, then annually
B. Retroperitoneal, Intra-abdominal and Uterine sarcoma:
   1. Initial staging
   2. Monitoring response to chemotherapy for known metastatic disease - every 2 cycles (6 to 8 weeks)
   3. Local or systemic recurrence – biopsy proven or clinically suspected based on new signs, symptoms or chest x-ray abnormalities
   4. Surveillance - may be with CT Chest with contrast (CPT®71260) or without contrast (CPT®71250)
      a. Every 3 months for 2 years, then every 6 months for 2 more years, then annually
C. Desmoid Tumors
   1. CT chest is not routinely indicated unless one of the following:
      a. New chest x-ray abnormalities
      b. Pulmonary signs or symptoms
      c. Sarcomatous differentiation
D. Dermatofibrosarcoma Protuberans (DFSP)
   1. CT chest is not routinely indicated unless one of the following:
      a. New chest x-ray abnormalities
      b. Pulmonary signs or symptoms
      c. Sarcomatous differentiation
E. Rhabdomyosarcoma
   1. Initial staging
   2. Monitoring response to chemotherapy for known metastatic disease - every 2 cycles (6 to 8 weeks)
   3. Surveillance (may be with CT Chest with contrast (CPT®71260) or without contrast (CPT®71250)
      a. No known lung metastases – CT chest every 3 months for 1 year, then every 4 months for 2 years after completion of all therapy
      b. Known lung metastases – CT chest every 3 months for 1 years, then every 4 months for 2 years, then every 6 months for 1 year after completion of all therapy
F. Kaposi’s Sarcoma
   1. Initial staging if extra-cutaneous visceral disease suspected
   2. Further imaging is indicated only for any pulmonary signs/symptoms or new chest x-ray abnormalities
G. GIST (gastrointestinal stromal tumor)
   1. Initial staging
   2. Monitoring response to chemotherapy for known metastatic disease - every 2 cycles (6 to 8 weeks)
3. Local or systemic recurrence – biopsy proven or clinically suspected based on new signs, symptoms or chest x-ray abnormalities
4. Surveillance – CT chest is not indicated for routine asymptomatic surveillance

LXIII. Melanoma
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging (either CT or PET may be obtained for this indication, NOT both)
   1. Stage III (palpable regional nodes or sentinel node positive)
   2. Stage IV (metastatic)
   3. Melanoma in transit
   4. Mucosal melanoma (including lip)
   5. Ocular or orbital melanoma
   6. Stage I or II melanoma, if there are signs or symptoms concerning for lung metastases or chest x-ray abnormalities
B. Monitoring response to treatment for known unresectable or metastatic disease
   a. Receiving chemotherapy – Every 2 cycles (6 to 8 weeks)
   b. Receiving maintenance therapy or immunotherapy – Every 3 months
C. Suspected recurrence – biopsy proven or clinically suspected
D. Surveillance
   1. Stage IA, IB and IIA – no routine advanced imaging is indicated
   2. Stage IIB, IIIA and IIIB – CT Chest (CPT®71260) and CT Abdomen/Pelvis (CPT®74177) with contrast every 6 months for 5 years
   3. Stage IIIIC and IV – CT Chest (CPT®71260) and CT Abdomen/Pelvis (CPT®74177) with contrast every 3 months for 3 years, then every 6 months for 2 years
   4. Ocular/Orbital Melanoma - CT Chest (CPT®71260) and CT Abdomen with contrast (CPT®74160) every 6 months for 2 years, then annually for 3 years

LXIV. Merkel Cell Carcinoma
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
1. Initial staging
2. Monitoring response to chemotherapy – every 2 cycles (6 to 8 weeks)
3. Suspected or biopsy proven recurrence
4. Surveillance – Only for node positive – every 6 months for years

LXV. Breast cancer
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging
   1. Clinical stages III and IV
   2. Clinical stages I and II, if there are signs or symptoms concerning for lung metastases or chest x-ray abnormalities
B. Monitoring response to treatment only for known metastatic disease:
   1. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   2. Patients receiving hormonal therapy – every 3 months
C. Suspected recurrence [One of the following]
   1. Biopsy proven recurrence
   2. New signs or symptoms concerning for metastatic disease
   3. Rising tumor markers such as CEA, CA 15-3, CA27.29
   4. Rising laboratory studies - hypercalcemia, elevated LFTs
   5. New chest x-ray abnormalities
D. Surveillance
   1. For known measurable metastatic disease to the chest, CT chest (CPT® 71260) may be obtained every 3 months while on treatment break or on maintenance therapy for up to 5 years.
   2. Routine advanced imaging is NOT indicated for:
      a. Initial staging of non-invasive or in-situ breast cancer
      b. Prior to lymph node sampling in Clinical stage I, II or III breast cancer
      c. After complete resection of primary tumor
      d. Before, during or after completion of adjuvant chemotherapy, adjuvant radiation therapy and/or adjuvant hormonal therapy for non-metastatic breast cancer

LXVI. Renal cell or Kidney carcinoma
   Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following
   A. Initial staging
   B. Monitoring response to treatment only for known metastatic disease:
      1. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
      2. Patients receiving immunotherapy – every 3 months
C. Suspected recurrence [One of the following]
   1. Biopsy proven recurrence
   2. New signs or symptoms concerning for metastatic disease
   3. New chest x-ray abnormalities
D. Surveillance
   1. Active surveillance (no treatment)
      a. Chest x-ray annually for 5 years, CT chest may be obtained for:
         i. New or worsening pulmonary signs/symptoms
         ii. New or worsening chest x-ray abnormalities
   2. Stage I/II cancer treated with Ablation therapy
      a. CT chest once within 3-6 months post-ablation
      b. Thereafter, chest x-ray annually for 5 years, CT chest may be obtained for:
         i. New or worsening pulmonary signs/symptoms
         ii. New or worsening chest x-ray abnormalities
   3. Stage I cancer treated with partial or complete nephrectomy
      a. CT chest once within 3-12 months post-resection
b. Thereafter, chest x-ray annually for 3 years, CT chest may be obtained for:
   i. New or worsening pulmonary signs/symptoms
   ii. New or worsening chest x-ray abnormalities

4. Stage II cancer treated with nephrectomy
   a. CT chest once within 3-6 months post-resection
   b. Thereafter, chest x-ray every 6 months for 3 years, then annually for 2 more years. CT chest may be obtained for:
      i. New or worsening pulmonary signs/symptoms
      ii. New or worsening chest x-ray abnormalities

5. Stage III cancer treated with nephrectomy
   a. CT chest within 3 to 6 months post-resection, then every 3 months for 3 years, then annually up to year 5

6. Stage IV/Metastatic cancer with no measurable disease
   a. CT chest within 3 to 6 months post-resection, then every 3 months for 3 years, then annually up to year 5

7. Stage IV/Metastatic cancer with measurable disease, not on treatment
   a. CT chest every 3 months

LXVII. Transitional cell cancer [arising from the bladder, ureters, prostate, urethra and renal pelvis]
   Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:
   A. Initial staging for one of the following histologies:
      1. Muscle invasive bladder cancer
      2. Urethral carcinoma
      3. Urothelial carcinoma of the prostate
   B. After completion of neoadjuvant therapy, prior to surgical resection
   C. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
   D. Suspected recurrence and any one of the following:
      1. New pulmonary signs or symptoms
      2. New chest x-ray abnormalities
   E. Surveillance – CT chest is not indicated for routine asymptomatic surveillance. Chest x-ray may be obtained.

LXVIII. Prostate Cancer
   Chest CT with contrast (CPT® 71260) is not routinely indicated in evaluation of prostate cancer except for one of the following:
   A. Concern for lung metastases based on one of the following:
      1. New pulmonary signs or symptoms
      2. New abnormalities noted on chest x-ray or other imaging studies
   B. Prior to start of Xofigo (Radium-223) therapy
LXIX. Testicular Cancer - Pure seminoma
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging – CT chest not routinely indicated, except for one of the following:
   1. Signs or symptoms concerning for pulmonary metastases
   2. New chest x-ray abnormalities
   3. Abdominal lymphadenopathy noted on CT scan
B. Suspected recurrence based on new symptoms, new chest x-ray abnormality, or rising tumor markers
C. CT Chest for routine surveillance of asymptomatic individuals, without prior chest involvement, is not indicated

LXX. Testicular Cancer - Non seminoma
Non-seminomatous germ cell tumors can present with various histologies – including but not limited to yolk-sac tumors, immature (malignant) teratomas, Choriocarcinomas (<1%), Embryonal cell carcinomas (15%-20%), Endodermal Sinus Tumors (ovarian) and Combinations of all of the above (Mixed).

Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging
B. Suspected recurrence based on new symptoms, new chest x-ray abnormality, or rising tumor markers
C. CT Chest for routine surveillance of asymptomatic individuals, without prior chest involvement, is not indicated
D. Advanced imaging is not indicated for sex cord stromal tumors (Sertoli-Leydig cell tumors)

LXXI. Ovarian Germ Cell tumors
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging – CT chest not routinely indicated, except for one of the following:
   1. Signs or symptoms concerning for pulmonary metastases
   2. New chest x-ray abnormalities
   3. Abdominal lymphadenopathy noted on CT scan
B. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
C. Recurrence suspected based on one of the following:
   1. Rising tumor markers or LFTs
   2. Known prior lung metastases
   3. Signs or symptoms concerning for pulmonary metastases
   4. New chest x-ray abnormalities
D. Surveillance - CT chest is not indicated for routine asymptomatic surveillance
E. Advanced imaging is not indicated for sex cord stromal tumors (granulosa cell tumors)
LXXII. **Extragonadal Germ Cell tumors**
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging
B. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
C. Recurrence suspected based on one of the following:
   1. Rising tumor markers or LFTs
   2. Known prior lung metastases
   3. Signs or symptoms concerning for pulmonary metastases
   4. New chest x-ray abnormalities
D. Surveillance - CT chest is not indicated for routine asymptomatic surveillance

LXXIII. **Ovarian Epithelial cancer**
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging – CT chest not routinely indicated, except for one of the following:
   1. Signs or symptoms concerning for pulmonary metastases
   2. New chest x-ray abnormalities
B. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
C. Recurrence suspected based on one of the following:
   1. Rising tumor markers - CA-125 or inhibin
   2. Known prior lung metastases
   3. Signs or symptoms concerning for pulmonary metastases
   4. New chest x-ray abnormalities
D. Surveillance - CT chest is not indicated for routine asymptomatic surveillance.

LXXIV. **Cervical cancer**
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging – CT chest not routinely indicated, except for one of the following:
   1. Signs or symptoms concerning for pulmonary metastases
   2. New chest x-ray abnormalities
   3. If para-aortic nodes are enlarged on CT abdomen/pelvis or found to be positive during surgery
B. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
C. Recurrence suspected based on one of the following:
   1. Known prior lung metastases
   2. Signs or symptoms concerning for pulmonary metastases
   3. New chest x-ray abnormalities
D. Surveillance - CT chest is not indicated for routine asymptomatic surveillance.
LXXV. Uterine cancer
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging only for one of the following:
   1. High risk histologies:
      a. Papillary serous
      b. Clear cell carcinoma
      c. Carcinosarcoma
      d. Soft tissue sarcoma of the uterus
      e. Leiomyosarcoma
      f. Undifferentiated sarcoma
      g. Endometrial stromal sarcoma
   2. Tumor incidentally detected or incompletely staged and one of the following:
      a. Myoinvasion >50%
      b. Cervical stromal involvement
      c. Lymphovascular invasion
      d. Tumor >2 cm
B. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
C. Recurrence suspected based on one of the following:
   1. Rising tumor markers or LFTs
   2. Known prior lung metastases
   3. Signs or symptoms concerning for pulmonary metastases
   4. New chest x-ray abnormalities
D. Surveillance - CT chest is not indicated for routine asymptomatic surveillance.

LXXVI. Squamous cell cancer of the external genitalia (vulva, vagina and penis)
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Initial staging
B. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
C. Recurrence suspected, based on one of the following:
   1. Biopsy proven or suspected local recurrence
   2. Difficult or abnormal examination
   3. Rising LFTs
   4. New pulmonary signs or symptoms
   5. New chest x-ray findings
D. Surveillance - CT chest is not indicated for routine asymptomatic surveillance.

LXXVII. Leukemias
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
Acute Leukemias:
A. Initial staging – CT chest not routinely indicated, except for one of the following:
   1. Known or strongly suspected T-cell histology
   2. New pulmonary signs or symptoms
   3. New chest x-ray findings
B. Monitoring response to chemotherapy only for known pulmonary metastatic disease - every 2 cycles (6 to 8 weeks)
C. For evaluation of infections during intensive chemotherapy regimen
D. Surveillance - CT chest is not indicated for routine asymptomatic surveillance. Once CT is negative, further surveillance is with chest x-ray

Chronic Myelogeneous Leukemia and Myeloproliferative Disorders:
Routine advanced imaging is not indicated in the evaluation and management of chronic myeloid leukemias, myelodysplastic syndromes or myeloproliferative disorders in the absence of specific localizing clinical symptoms or clearance for hematopoietic stem cell transplantation.

Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma:
A. Initial staging
B. Monitoring response to chemotherapy only for patients with known bulky (> 5 cm) nodal disease at initial diagnosis- every 2 cycles (6 to 8 weeks)
C. End of therapy evaluation for patients with known bulky (> 5 cm) nodal disease at initial diagnosis
D. Suspected recurrence or relapse
E. Surveillance –for patients with known bulky (> 5 cm) nodal disease at initial diagnosis – CT chest every 6 months for 2 years, and then annually thereafter

LXXVIII. Non-Hodgkin's Lymphoma
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
Diffuse Large B cell and Grade III Follicular lymphoma:
A. Suspected lymphoma
B. Initial staging (either CT or PET or both may be approved for this indication)
C. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
D. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET or both may be approved for this indication)
E. Suspected or biopsy-proven recurrence
F. Surveillance:
   1. Stage I and II – no routine advanced imaging indicated
   2. Stage III and IV – CT chest every 6 months for 2 years

Grade I and II Follicular lymphoma:
A. Suspected lymphoma
B. Initial staging
C. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
D. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET may be approved for this indication, not both)
E. Suspected or biopsy-proven recurrence
F. Surveillance: CT chest every 6 months for 2 years and then annually

Marginal Zone and MALT lymphoma:
A. Initial staging
B. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
C. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET may be approved for this indication, not both)
D. Suspected or biopsy-proven recurrence
E. Surveillance
   1. Stage I and II – no routine advanced imaging indicated
   2. Stage III and IV – CT chest every 6 months for 2 years and then annually

Mantle Cell lymphoma:
A. Initial staging
B. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
C. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET may be approved for this indication, not both)
D. Suspected or biopsy-proven recurrence
E. Surveillance – CT chest is not indicated for routine asymptomatic surveillance.

Burkitt’s lymphoma:
A. Initial staging
B. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
C. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET or both may be approved for this indication)
D. Suspected or biopsy-proven recurrence
E. Surveillance – CT chest is not indicated for routine asymptomatic surveillance.

Cutaneous and T-cell lymphoma:
A. Suspected lymphoma
B. Initial staging (either CT or PET or both may be approved for this indication)
C. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
D. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET or both may be approved for this indication)
E. Suspected or biopsy-proven recurrence
F. Surveillance:
1. Stage I and II – no routine advanced imaging indicated
2. Stage III and IV – CT chest every 6 months for 2 years

Primary CNS lymphoma:
A. Initial staging of newly diagnosed primary CNS lymphoma
B. CT chest is not routinely indicated for monitoring treatment response or surveillance.

Castleman’s Disease:
A. Initial staging of unicentric and multicentric disease
B. Monitoring response to chemotherapy every 2 cycles (6-8 weeks) for:
   1. Multicentric disease
   2. Surgically unresected unicentric disease
C. Recurrence suspected based on one of the following:
   1. Rising LDH, IL-6 or VEGF levels
   2. Recurrent B symptoms
   3. Signs or symptoms concerning for pulmonary involvement
D. Surveillance – CT chest (if prior chest involvement) every 6 months for up to 5 years

LXXIX. Hodgkin’s lymphoma
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Suspected lymphoma
B. Initial staging (either CT or PET or both may be approved)
C. Monitoring response to chemotherapy every 2 cycles (6-8 weeks) (either CT or PET may be approved)
D. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET or both may be approved)
E. Suspected or biopsy-proven recurrence

LXXX. Surveillance – CT chest at 6, 12 and 24 months after completion of all therapy
Hematopoietic Stem Cell transplantation
Chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) may be obtained for one of the following:
A. Immediately prior to transplant (within 30 days)
B. Post transplantation BOOP (bronchiolitis obliterans)

LXXXI. Metastatic Cancer from an Unknown Primary site
Chest CT with contrast (CPT® 71260) may be obtained for one of the following:
A. Evaluation of primary site when one of the following apply:
   1. Carcinoma found within a lymph node or organ known not to be the primary
   2. Sebaceous carcinoma of the skin
   3. Adenocarcinoma within axillary lymph node
4. Metastases to the brain
5. Pathological fracture of the bone

B. Monitoring response to chemotherapy every 2 cycles (6-8 weeks) if chest previously involved
C. Surveillance imaging as per primary site

References:
22. Varga J. Evaluation for and diagnosis of lung disease in systemic sclerosis (scleroderma), UpToDate. http://www.uptodate.com/online/content/topic.do?topicKey=int_lung/9113&selectedTitle=5~150&source=search_result
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57. Ajani JA, D’Amico TA, Almhanna K et al, National Comprehensive Cancer Network (NCCN) Guidelines Version 1.2017. Gastric cancer, available at: https://www.nccn.org/professionals/physician_gls/pdf/gastric.pdf Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Gastric cancer V 1.2017. ©2017 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.


71250, 71260, 71270 CT of the Chest
I. Thoracic Aorta
Thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians’ preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

<table>
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<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast;</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT® 71275, CPT® 74175, CPT® 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT® 71555, CPT® 74185, CPT® 72198)</td>
</tr>
</tbody>
</table>

A. Aortic Dissection
1. Classic symptoms of sharp, severe acute onset of retrosternal or interscapular chest pain is seen in 96% and is best adapted to the emergent setting. CXR is imprecise; any suspicion should be considered since up to 10% of patients with aortic dissection present without classic symptoms.
   a. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries.
2. CTA is the test of choice given its superior spatial resolution, ease of monitoring the patient in the CT scanner, availability and speed of imaging. MRI can be performed as well but has limitations as detailed above.
   a. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed.
   b. “Medically” treated (usually type B) patients.
      i. Every 6 months if total aortic diameter is ≥4.5 cm.
      ii. Annually if total aortic diameter is <4.5 cm.
   c. Surgery or Stent treatment for any type dissection (A or B).
      i. First Year: 1 month, 3 months, 6 months, 12 months, then annually.

B. Thoracic Aortic Aneurysm (TAA)
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
2. Abnormalities identified on Chest –x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc.) abnormality.
3. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above.¹,²,³,⁴,⁵
4. For planning for pre–thoracic endovascular repair (TEVAR) of thoracic aorta disease.⁹
5. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following: ⁴,⁵,⁷,⁹
   a. “Medically” treated/observation.
   b. 3.5 to 4.4 cm TAA can be followed annually.
   c. ≥ 4.5 cm TAA can be followed every 6 months.
   d. ≥ 3.0 cm TAA when there is concern for growth can have a one-time 3 month interval advanced imaging.
   a. Preoperative open or endovascular (stent) repair imaging is appropriate.
      i. Suspicion of endoleaks.
   b. Open Repair imaging every 3 to 5 years.
7. Endovascular graft/stent.
   a. First year: 1 month, 3 months, 6 months, 12 months, then annually.
8. Screening with Abdominal Aortic Aneurysm (AAA).
10. Known AAA screening for TAA is not supported by sufficient evidence.

C. Screening Guidelines for Familial Syndromes
1. Screening for Familial Syndromes and Genetic Syndromes. ⁴,⁵,⁶,⁸,⁹
   a. Suspected Familial Thoracic Aortic Aneurysm.
      i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection.
      01. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately.
      02. Follow-Up per TAA Follow-Up guidelines.
2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV ⁴,⁵,⁸,⁹
   a. Suspected, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
   b. Follow-up:
      i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines.

D. Thoracic Aorta in Individuals with Bicuspid Aortic Valve
1. Screening for Bicuspid Aortic Valve ⁸,¹⁰
   a. Suspected, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308).
i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.

b. Follow-up per TAA Follow-Up guidelines.
i. If no dilatation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging.

E. Calcified Ascending Aorta

1. Prior to open-heart operations.\textsuperscript{11,12,13}
a. Transesophageal echocardiography (TEE), Intraoperative ultrasonography and/or open direct aortic palpation are used to detect atherosclerotic changes in the aortic wall.\textsuperscript{10,11}
b. Prior to TAVR/I (Transcatheter Aortic Valve Replacement/Implantation).\textsuperscript{3}

Thoracic Aorta References


II. Pulmonary Arteriovenous Malformation (AVM)

A. Chest CT with contrast, chest CTA (preferred modality) (CPT® 71275), or chest MRA (CPT® 71555) or can be obtained for evaluation of: 1, 2, 3

1. Suspected pulmonary AVM.
2. First degree relatives of a patient with a primary pulmonary AVM.
3. Evaluation of patients with paradoxical embolus/stroke and no evidence of patent foramen ovale on echocardiogram.

Pulmonary Arteriovenous Malformation (AVM) References


III. Pulmonary Embolism (PE)

A. Chest CT with contrast with PE protocol (CPT® 71260) or chest CTA (CPT® 71275) would be appropriate if at least one symptom, clinical/laboratory finding or risk factor from each of the lists below are present.

1. With any one of the: 3, 6, 7, 8
   a. Dyspnea, new onset and otherwise unexplained;
   b. Chest Pain, pleuritic;
   c. Tachypnea
   
   AND, with any one of the 3: 6, 7, 8
   d. Abnormal D-dimer test;
   e. Wells Criteria score* higher than 4 points;
   f. One Risk Factor** or Symptom** of new onset demonstrating high clinical probability of PE
### Risk Factors** 6,7,8

<table>
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<tr>
<th>RISK FACTORS</th>
<th>SYMPTOMS ATTRIBUTED TO PE** 6,7,8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immobilization at least 3 days or surgery in last 4 weeks or recent trauma</td>
<td>Signs or symptoms of DVT</td>
</tr>
<tr>
<td>Previous history of DVT or PE</td>
<td>Hemoptysis</td>
</tr>
<tr>
<td>Cancer actively treated in last 6 months or receiving palliative treatment</td>
<td>Right heart strain or failure</td>
</tr>
<tr>
<td>Recent history of a long airplane flight</td>
<td>Systolic BP&lt;90</td>
</tr>
<tr>
<td>Use of estrogen-based contraceptives (birth control pills, the patch, and vaginal ring)/Oral estrogen (1)</td>
<td>Syncope</td>
</tr>
<tr>
<td>Advanced age (/&gt;=70)</td>
<td>Cough</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>Heart Rate &gt;100</td>
</tr>
<tr>
<td>Obesity (BMI &gt;/= 35)</td>
<td>Palpitations</td>
</tr>
</tbody>
</table>

### Well’s Criteria for Clinical Probability of PE* 6

| Clinical signs/symptoms of DVT (at minimum: leg swelling and pain with palpation of the deep veins) | 3 |
| PE is likely or equally likely diagnosis | 3 |
| Heart rate >100 | 1.5 |
| Immobilization at least 3 days or surgery in last 4 weeks | 1.5 |
| Previous history of DVT or PE | 1.5 |
| Hemoptysis | 1 |
| Cancer actively treated in last 6 months or receiving palliative treatment | 1 |

Calculate Probability: Low <2 Moderate 2 to 6 High >6

Using the above criteria, only 3% of patients with a low pretest probability had PE versus 63% of those with a high pretest probability.

**B.** Non-urgent cases which do not meet above 2-step criteria, should undergo prior to advanced imaging: 9
1. Chest x-ray (to rule out other causes of acute chest pain).
2. Primary cardiac and pulmonary etiologies should be eliminated.

**C.** Pregnant women with suspected PE are suggested to proceed with1,9
1. D-dimer and/or;
2. Doppler studies of the lower extremities;
3. V/Q preferred if Doppler negative; Chest CTA (CPT® 71275) or chest MRA (CPT® 71555) can be performed if V/Q scanning is not available.
D. Ventilation-perfusion scans, also called V/Q, scans (CPT® 78580-Pulmonary Perfusion Imaging; CPT® 78582-Pulmonary Ventilation (e.g., Aerosol or Gas) and Perfusion Imaging.
   1. Is not a replacement for CTA Chest
   2. Can be considered in any of the following:
      a. Suspected pulmonary embolism if there is a contraindication to CT or CTA of the chest (ventilation-perfusion scans CPT® 78582).
      b. Suspected pulmonary embolism when a Chest x-ray is negative and CTA Chest is not diagnostic (CPT®78580 or CPT® 78582).
      c. Follow-up of an equivocal or positive recent ventilation-perfusion lung scan to evaluate for interval change (CPT® 78580).

E. Follow-up Imaging in Stable or Asymptomatic Patients with Known PE is not warranted

F. Chest CT with contrast with PE protocol (CPT®71260) or chest CTA (CPT®71275) can be performed for any of the following indications:
   1. Recurrent signs or symptoms such as dyspnea, or
   2. Elevated d-dimer which is persistent or recurrently elevated, or
   3. Right heart strain or failure identified by EKG, ECHO or Heart catheterization.

Pulmonary Embolism (PE) References

   http://www.bmj.com/content/336/7655/1227.


IV. Developmental anomalies of the thoracic vasculature for initial evaluation, treatment planning and post-operative evaluation (MRI or MRA) [One of the following]
A. Coarctation of the aorta
B. Right-sided aortic arch
C. Truncus arteriosus
D. Persistent left superior vena cava
E. Interrupted inferior vena cava
F. Total anomalous pulmonary venous return
G. Pulmonary artery atresia
H. Pulmonary artery hypoplasia
I. Bicuspid aortic valve
J. Patent ductus
K. Tetralogy of Fallot
L. ASD
M. Ebstein’s anomaly
N. Corrected transposition of the great vessels
O. Sinus of Valsalva aneurysm
P. Coronary artery anomalies
Q. VSD
R. Other known or suspected congenital anomalies of the heart

V. Pulmonary vein (and artery) mapping: Cardiac MRI (CPT® 75557 or CPT® 75561), chest MRV (CPT® 71555), chest CTV (CPT® 71275), or cardiac CT (CPT® 75572) [One of the following]
A. Planned radiofrequency ablation for treatment of atrial fibrillation
B. Following radiofrequency ablation if there is a suspicion of venous stenosis; and can be imaged at 1, 3, 6, and 12 months

VI. Transcatheter Aortic Valve Replacement (TAVR)
A. Once the decision has been made for aortic valve replacement, the following may be used to determine if a patient is a candidate for TAVR:
1. CTA of chest (CPT®71275), abdomen and pelvis (combination code CPT®74174) is considered appropriate, and
2. Cardiac CT (CPT®75572) may be considered to measure the aortic annulus or
3. Coronary CTA (CCTA CPT® 75574) may be considered to both measure the aortic annulus and assess the coronary arteries in lieu of heart catheterization

B. Post TAVR:
1. TAVR follow-up may be approved at 3 months, at one year post-procedure, and annually thereafter.

VII. Subclavian Steal Syndrome
A. Initial evaluation should include clinical findings satisfying the symptom complex and initial imaging with carotid duplex study (CPT® 93882).
   1. Satisfying the symptom complex.
      a. Physical examination findings suggestive of subclavian stenosis include a discrepancy of >15 mmHg in blood pressure readings taken in both upper extremities, delayed or decreased amplified pulses in the affected side, and a bruit in the supraclavicular area on the affected side.
      b. Symptoms include vertebral basilar artery insufficiency, vertigo, limb paresis, and paresthesias. Bilateral cortical visual disturbances, ataxia, syncope, and dysarthria occur less frequently.
      c. Symptoms of cerebral ischemia may be produced by exercise of the affected arm.
   2. Carotid duplex study (CPT® 93882) is the initial and definitive imaging study
   4. If the carotid duplex is not diagnostic for reversal of flow in the ipsilateral vertebral artery, then neurological symptoms should be evaluated according to the Head guidelines.
   5. Neck and chest MRA (CPT® 70548 and CPT® 71555) or CTA (CPT® 70498 and CPT® 71275) can be performed for diagnosis in patients with symptoms of vertebrobasilar ischemia if the clinical exam and duplex study are positive, indeterminate, or as preoperative studies if they will substitute for invasive angiography.

Subclavian Steal Syndrome References

VIII. SVC Syndrome
A. Chest CT with contrast (CPT® 71260) is the initial imaging studies of choice for the evaluation of suspected SVC syndrome based on the facial cyanosis and UE swelling without anasarca.¹²
1. MRV (CPT® 71555) or CTV (CPT® 71275) of the chest may be indicated when stenting of the SVC is being considered.¹²
SVC Syndrome References


IX. Breast Reconstruction

A. CTA or MRA of the body part from which the free tissue transfer flap is being taken, can be performed for breast reconstruction preoperative planning.2 3

1. For example, CTA (CPT®74175 and CPT®72191) or MRA (CPT®74185 and CPT®72198) of the abdomen and pelvis for Deep Inferior Epigastric Perforators (DIEP) flap

B. There is currently insufficient evidence-based data to support the need for routine advanced imaging for TRAM flaps or other flaps performed on a vascular pedicle.

X. Hemoptysis (see CT Chest)

XI. Dysphagia

A. CT angiography Chest with contrast can be used in the evaluation of suspected vascular ring

71275 CTA Chest
71550 MRI of the Chest without Gadolinium
71551 MRI of the Chest with Gadolinium
71552 MRI of the Chest without and with Gadolinium

I. Mediastinum
   A. Chest CT with contrast (CPT®71260) is the imaging study of choice to evaluate mediastinal abnormalities on chest x-ray and can be done once initially if there is a concern for:
      1. Mediastinal cyst including bronchogenic, thymic, pericardial or esophageal
         a. Subsequent evaluations either with CT Chest or MRI Chest can be performed if:
            i. New signs or symptoms or
            ii. Preoperative

II. Great vessels [One of the following]4-7
   A. Anomalies of the aortic arch [One of the following]
      1. Abnormal mediastinal contour on chest x-ray
      2. Abnormal echocardiogram
   B. Monitoring the aorta in Marfan syndrome and annuloaortic ectasia
   C. Establishing the source of peripheral embolization [One of the following]
      1. Cyanosis of a single extremity or part of an extremity
      2. Abdominal angina
      3. Stroke or TIA
   D. Diagnosis and assessment of the severity of coarctation, including post-angioplasty evaluation
   E. Diagnosis of periaortic abscess or infectious pseudoaneurysm in bacterial endocarditis of the aortic valve
   F. Assessment of the origin and proximal parts of the great vessels for possible causes of cerebrovascular disease
      1. History of stroke or TIA
   G. Intramural hematoma
   H. Aortitis [One of the following]
      1. Upper extremity claudication
      2. Stroke
      3. Transient cerebral ischemia
      4. Dizziness or syncope
      5. Subclavian steal
      6. Retinopathy
      7. Raynaud’s phenomenon
      8. Hypertension, sometimes malignant
   I. Suspected thoracic aortic dissection (See indication V below)
   J. Thoracic or thoracoabdominal aneurysm (See VI below)
III. Pleura \(^8\) (CT)
   A. Tumor
      1. Mesothelioma
         a. Inconclusive Chest CT

IV. Preoperative planning Brachial plexus \(^9\)-14
   A. Brachial plexus studies can be coded either as upper extremity other than joint MRI without or without and with contrast (CPT\(^®\)73218 or CPT\(^®\)73220), chest MRI without or without and with contrast (CPT\(^®\)71550 or CPT\(^®\)71552) or neck MRI without (CPT\(^®\)70540) or without and with contrast (CPT\(^®\)70543) (if upper trunk) after EMG/NCV examination for:
      1. Malignant infiltration (EMG not required)
      2. Radiation plexitis to r/o malignant infiltration
   B. Brachial plexitis (Parsonage-Turner Syndrome or painful brachial amyotrophy).
      a. Self-limited syndrome characterized by initial shoulder region pain followed by weakness of specific muscles in a pattern which does not conform to involvement of a single root or distal peripheral nerve
      b. Consider MRI of the cervical spine if radiculopathy.
   C. Traumatic injury
   D. Neurogenic Thoracic Outlet Syndrome (TOS) failed a 2 to 3 month trial of conservative management and are being considered for surgical treatment.
   E. Preoperative study which requires evaluation of the brachial plexus

V. Suspected or known dissection of the aorta

Thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians’ preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

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<td>CTA of chest, and/or abdomen, and/or pelvis (CPT(^®)71275, CPT(^®)74175, CPT(^®)72191);</td>
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<td>MRA of chest, and/or abdomen, and/or pelvis (CPT(^®)71555, CPT(^®)74185, CPT(^®)72198)</td>
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A. Classic symptoms of sharp, severe acute onset of retrosternal or interscapular chest pain is seen in 96% and is best adapted to the emergent setting. CXR is imprecise; any suspicion should be considered since up to 10% present without classic symptoms.

1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries

2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
   a. “Medically” treated (usually type B)
   b. Every 6 months if total aortic diameter is ≥4.5 cm
   c. Annually if total aortic diameter is <4.5 cm
   d. Surgery or Stent for any type dissection (A or B)
   e. First Year: 1 month, 3 months, 6 months, 12 months, then annually

VI. Thoracic or thoracoabdominal aneurysm

Thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians’ preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

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A. Thoracic Aortic Aneurysm (TAA)

1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest –x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality

2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above

3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
ii. \( \geq 4.5 \text{ cm} \) TAA can be followed every 6 months  
iii. \( \geq 3.0 \text{ cm} \) TAA when there is concern for growth can have a one-time 3 month interval advanced imaging  

b. Surgery or Stent  
i. Preoperative open or endovascular (stent) repair imaging is appropriate  
ii. Suspicion of endoleak  
iii. Open Repair imaging every 3 to 5 years  
c. Endovascular graft/stent  
i. First year: 1 month, 3 months, 6 months, 12 months, then annually  

4. Screening with Abdominal Aortic Aneurysm (AAA)  
a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US) (see: AB-17.1 Abdominal Aortic Aneurysm)  
b. Known AAA screening for TAA is not supported by sufficient evidence  

B. Screening for Familial Syndromes and Genetic Syndromes  
1. Suspected Familial Thoracic Aortic Aneurysm  
i. ECHO (CPT®93306, CPT®93307, or CPT®93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection  
b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately  
c. Follow-Up per TAA Follow-Up guidelines  
2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV  
a. Suspected: ECHO (CPT®93306, CPT®93307, or CPT®93308) at the time of diagnosis.  
Follow-up: Annual ECHO (CPT®93306, CPT®93307, or CPT®93308) or per TAA Follow-Up guidelines  

C. Screening for Bicuspid Aortic Valve  
1. Suspected, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT®93306, CPT®93307, or CPT®93308)  
a. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.  
b. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.  
2. Follow-up per TAA Follow-Up guidelines  
a. If no dilatation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging.  

VII. **Chest Wall Mass**  
A. Chest X-ray or chest ultrasound (CPT® 76604) should be performed initially in all cases of chest wall mass.
B. Chest CT with contrast (CPT® 71260) or Chest CT without contrast (CPT® 71250) or MRI chest without and with contrast (CPT® 71552) can be considered when the following are met:
   1. Chest x-ray completed and does not demonstrate any of the following:
      a. Obvious lipoma
      b. Clearly benign entity
      c. No mass identified (radiographically or palpated)

VIII. Pectus Excavatum and Carinatum
A. Chest CT without contrast (CPT® 71250) or MRI chest without and with contrast (CPT® 71552) and 3-D reconstruction (CPT® 76377) if requested can be considered if:
   1. Candidates for surgical correction
      a. Cosmetic repairs requests without physiological disability or severe deformities may not meet certain payers policies
   2. Cardiac or pulmonary dysfunction has been identified
B. ECG and echocardiography if cardiac symptoms or evidence of abnormalities of cardiac function.
C. Chest x-ray and PFT's if increasing shortness of breath

IX. Arteriovenous fistula with “high output” heart failure: 30-31
A. CT Chest with contrast (CPT® 71260 ) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) OR
B. CTA Chest (CPT® 71275 ) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) OR
C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) OR
D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)

X. Dysphagia 32-34
A. Esophagram (Barium swallow) evaluation is considered the initial study in the evaluation of dysphagia. These results can then lead to further evaluation with:
   1. Endoscopy is usually performed next
   2. Neck CT with contrast (CPT® 70491) and/or chest CT with contrast (CPT® 71260) and/or abdominal CT with contrast (CPT® 74160) (if requested)
   3. Chest MRI without contrast, or chest MRI without and with contrast (CPT® 71552), can be performed if vascular ring is suspected

XI. Thoracic Outlet Syndrome
A. Chest X-ray after the current episode of symptoms started or changed should be performed initially in all cases since it can identify bone abnormalities or other causes of right upper extremity pain.
B. MR imaging is the preferred imaging modality in patients with suspected TOS
1. Chest MRI (CPT®71550) or upper extremity other than joint MRI (CPT®73218)
2. Neck and chest MRA (CPT®70548 and CPT®71555) can be used in place of MRI with suspected arterial or venous TOS
3. CT Chest with contrast or CT Neck with contrast can be used in place of MRI if:
   a. Suspected anomalous ribs or fractures, as bone anatomy is more easily definable at CT
   b. Postoperative patients in whom there is a question of a remnant first rib.
   c. Dialysis-dependent renal failure, claustrophobia, or implanted device incompatibility

**XII. Costochondritis/Other Musculoskeletal Chest Wall Syndrome**

A. Costochondritis or other suggested musculoskeletal chest wall syndrome does not require advanced imaging (CT or MRI) unless it meets other criteria in these guidelines. Costochondritis can be readily diagnosed with palpation tenderness and/or hooking maneuver and imaging is non-specific.

References:


71550, 71551, 71552 MRI of the Chest
I. **Pulmonary Arteriovenous Malformation (AVM)**
   A. Chest CT with contrast, chest CTA (preferred modality) (CPT® 71275), or chest MRA (CPT® 71555) or can be obtained for evaluation of:¹ ² ³
   1. Suspected pulmonary AVM.
   2. First degree relatives of a patient with a primary pulmonary AVM.
   3. Evaluation of patients with paradoxical embolus/stroke and no evidence of patent foreman ovale on echocardiogram.

References


II. **Subclavian Steal**
   A. Initial evaluation should include clinical findings satisfying the symptom complex and initial imaging with carotid duplex study (CPT® 93882).
   1. Satisfying the symptom complex.
      a. Physical examination findings suggestive of subclavian stenosis include a discrepancy of >15 mmHg in blood pressure readings taken in both upper extremities, delayed or decreased amplified pulses in the affected side, and a bruit in the supraclavicular area on the affected side.
      b. Symptoms include vertebral basilar artery insufficiency, vertigo, limb paresis, and paresthesias. Bilateral cortical visual disturbances, ataxia, syncope, and dysarthria occur less frequently.
      c. Symptoms of cerebral ischemia may be produced by exercise of the affected arm.
   2. Carotid duplex study (CPT® 93882) is the initial and definitive imaging study

B. Reversal of flow in the ipsilateral vertebral artery.
   1. If the carotid duplex is not diagnostic for reversal of flow in the ipsilateral vertebral artery, then neurological symptoms should be evaluated according to the Head guidelines.
2. Neck and chest MRA (CPT® 70548 and CPT® 71555) or CTA (CPT® 70498 and CPT® 71275) can be performed for diagnosis in patients with symptoms of vertebrobasilar ischemia if the clinical exam and duplex study are positive, indeterminate, or as preoperative studies if they will substitute for invasive angiography.

References


III. Thoracic Outlet Syndrome

A. Chest X-ray should be performed initially in all cases, after the onset of symptoms or if there has been a change in symptoms, since it can identify boney abnormalities or other causes of right upper extremity pain.1,2

1. MR imaging is the preferred imaging modality in patients with suspected TOS.1,2
   a. Chest MRI (CPT® 71550) or upper extremity other than joint MRI (CPT® 73218).
      i. Neck and chest MRA (CPT® 70548 and CPT® 71555) can be used in place of MRI with suspected arterial or venous TOS.
      ii. CT Chest with contrast or CT Neck with contrast can be used in place of MRI for:
   b. Suspected anomalous ribs or fractures, as bone anatomy is more easily definable with CT.
      i. Postoperative patients in whom there is a question regarding a remnant first rib.
      ii. Dialysis-dependent renal failure, claustrophobia, or implanted device incompatibility.
      iii. Also see PN-4: Brachial Plexus in the Peripheral Nerve Disorders Guidelines.

References


IV. Thoracic Aorta (See CTA Chest)
V. Pulmonary vein (and artery) mapping\textsuperscript{28-29,36-38} Cardiac MRI (CPT\textsuperscript{®} 75557 or CPT\textsuperscript{®} 75561), chest MRV (CPT\textsuperscript{®} 71555), chest CTV (CPT\textsuperscript{®} 71275), or cardiac CT (CPT\textsuperscript{®} 75572) [One of the following]
   A. Planned radiofrequency ablation for treatment of atrial fibrillation
   B. Following radiofrequency ablation if there is a suspicion of venous stenosis; and can be imaged at 1, 3, 6, and 12 months

VI. Breast Reconstruction
   A. CTA or MRA of the body part from which the free tissue transfer flap is being taken, can be performed for breast reconstruction preoperative planning\textsuperscript{2,3}
   B. For example, CTA (CPT\textsuperscript{®}74175 and CPT\textsuperscript{®}72191) or MRA (CPT\textsuperscript{®}74185 and CPT\textsuperscript{®}72198) of the abdomen and pelvis for Deep Inferior Epigastric Perforators (DIEP) flap
   C. There is currently insufficient evidence-based data to support the need for routine advanced imaging for TRAM flaps or other flaps performed on a vascular pedicle.

71555 MRA or MRV Chest
Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes, the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR, etc.
- Urinary tract infections
- Pain increased when supine
- Aural temperature >38.3°C or >100.9°F
- Urinary incontinence
- Urinary retention
- Decreased anal sphincter tone
- Saddle anesthesia
  - Major motor weakness of a limb found on physical examination (objectively graded as less than 3/5)
  - Major acute trauma (This is age-dependent; lesser trauma required in older patients)

I. Neck pain for at least 6 weeks and MRI cannot be performed
   [One of the following]
   - A. No red flags and failure to respond to conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids
   - B. Symptoms worsening while under treatment described in A
   - C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

II. Trauma
    [One of the following]
    - A. Fracture by x-ray
    - B. Posterior midline (bony) tenderness in the cervical spine
    - C. Older than 64
    - D. Paresthesias in the extremities
    - E. Inability to rotate the neck actively
    - F. Fracture by CT at other level of the spine
    - G. Trauma with altered mental status
H. History of DISH (diffuse idiopathic skeletal hyperostosis)
I. Ankylosing spondylitis (CPT® 72125)
J. Falls from height of 3 feet or 5 or more stairs
K. Diving accident
L. Follow up of known cervical spine fracture to assess healing

III. Suspected malignancy5-9 [One of the following]
A. Suspected primary or metastatic tumor of the cervical cord or leptomeninges
   (For medulloblastoma or ependymoma, see X and XI below) [One of the following]
   1. Symptoms or findings on examination [One of the following]
      a. Hyperreflexia
      b. Weakness of the upper or lower extremity (objective weakness on exam that is 3/5 or less)
      c. Spasticity
      d. Bladder dysfunction
      e. Bowel dysfunction
      f. Lhermitte’s sign
      g. Sensory deficit
      h. New onset scoliosis
      i. New onset kyphosis
      j. Spastic gait
      k. Radiculopathy
      l. Pain in the neck or back
      m. Localized tenderness over the spine
      n. Spinal pain interfering with sleep
      o. CSF cytology positive for malignant cells
B. Primary or metastatic bone tumor
   1. Known malignancy with cervical spine pain
   2. Follow-up primary or metastatic bone tumor confirmed on prior imaging study
   3. New or worsening pain at site of known bone tumor
   4. Periodic assessment during chemotherapy, radiation Rx, or surgery for bone tumor
   5. Pain
   6. New onset scoliosis
   7. New onset kyphosis

IV. Myelopathy10 (MRI; CT myelogram should only be performed if MRI is absolutely contraindicated except if myelopathy is suspected to be related to trauma) [One of the following]
A. Symptoms or findings on examination [One of the following]
   1. Clumsiness of the hands
   2. Paresthesias of the hands
   3. Gait disturbance
   4. Lhermitte’s sign (cervical flexion and extension producing electric shocks down the arm and leg)
5. Hoffman’s sign (evidence of upper motor neuron lesion from spinal cord compression)
6. Neck stiffness
7. Weakness or stiffness of the legs (objective weakness on exam that is 3/5 or less)
8. Arm pain
9. Bowel and bladder control problems
10. Hyperreflexia
11. Ankle clonus
12. Numbness and/or tingling in the upper extremities
13. Positive Babinski sign
14. Loss of coordination

B. Known myelopathy including MS [One of the following]
   1. Baseline or follow-up of treatment medication
   2. New or worsening of symptoms as in A above
   3. Annual follow-up with no change in signs or symptom

V. Radiculopathy with symptoms for at least 6 weeks\textsuperscript{11-13} (MRI; CT should only be performed if MRI is absolutely contraindicated) [One of the following]

Presence of red flags waives any conservative management requirements.

A. Clinical findings and/or symptoms with no red flags; with incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]
   1. Arm pain
   2. Neck pain
   3. Scapular or periscapular pain
   4. Paresthesias (tingling)
   5. Numbness
   6. Weakness of the arm
   7. Abnormal reflexes in the arm
   8. Muscle atrophy
   9. Dysesthesias (burning sensation)
   10. Deltoid weakness
   11. Scapular winging
   12. Weakness of the muscles of the hand
   13. Objective weakness in a nerve root distribution on examination which is 3/5 or less
   14. Positive Spurling’s test

B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy described in A and one of the symptoms described in A
VI. Spinal stenosis with symptoms for at least 6 weeks\textsuperscript{11-13} (MRI; CT should only be performed if MRI is absolutely contraindicated)  
A. Clinical findings and/or symptoms with no red flags; with incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]  
1. Arm pain  
2. Neck pain  
3. Scapular or periscapular pain  
4. Paresthesias (tingling)  
5. Numbness  
6. Weakness of the arm  
7. Abnormal reflexes in the arm  
8. Muscle atrophy  
9. Dysesthesias (burning sensation)  
10. Deltoid weakness  
11. Scapular winging  
12. Weakness of the muscles of the hand  
13. Objective weakness in a nerve root distribution on examination which is 3/5 or less  
14. Positive Spurling’s test  
B. Symptoms worsening while under treatment described in A  
C. Candidate for surgery or epidural injection after failed conservative therapy described in A and one of the symptoms described in A  

VII. Infection\textsuperscript{14} (MRI without and with contrast, and CT should not be done unless there is an absolute contraindication for MRI) [One of the following]  
A. Osteomyelitis [One of the following]  
1. Laboratory findings [One of the following]  
   a. Aural temperature >38.3°C or >100.9°F  
   b. WBC >11,500/cu.mm  
   c. ESR >22 mm/hr  
   d. C-reactive protein >10 mg/L  
   e. Blood culture positive  
2. History of infection elsewhere  
3. History of diabetes, dialysis or peripheral vascular disease  
4. X-ray suggestive of osteomyelitis of the cervical spine  
5. Sinus tract, poor wound or fracture healing of the spine  
6. History of penetrating injury or surgery of the cervical spine  
B. Pre-operative evaluation of osteomyelitis  
C. Follow-up during or after therapy for osteomyelitis, epidural abscess or disc space infection [One of the following]  
1. New or worsening pain at site or neurologic signs or symptoms  
2. Periodic evaluation of response to therapy  
D. Suspected epidural abscess or disc space infection [All of the following]
1. Progressive neurological symptoms [One of the following]
   a. Radiating nerve root pain
   b. Muscle weakness
   c. Sensory deficit
2. Risk factors [One of the following]
   a. Trauma
   b. Prior spinal procedure
   c. Infection elsewhere
   d. IV drug use
   e. Diabetes
   f. Immunosuppression
3. Clinical and laboratory findings [One of the following]
   a. Aural temperature >38.3°C or >100.9°F
   b. WBC >11,500/cu.mm
   c. ESR >22 mm/hr
   d. C-reactive protein >10 mg/L
   e. Blood culture positive

E. Follow-up during therapy for epidural abscess or disc space infection [One of the following]
   1. New or worsening pain at site or neurologic signs or symptoms
   2. Periodic evaluation of response to therapy

VIII. Discography
      A. To confirm that the symptoms are attributable to a particular disc prior to therapeutic intervention

IX. Evaluation of scoliosis [One of the following]
    A. Preoperative assessment
    B. Any neurologic finding in the presence of scoliosis
    C. Atypical curve pattern
    D. Congenital scoliosis
    E. Neurofibromatosis
    F. Marfan’s syndrome

X. Evaluation for possible vertebroplasty
    A. Painful osteoporotic or non neoplastic compression fracture
       1. No red flags and failure to respond to conservative medical management [One of the following]
          a. Continued pain after anti-inflammatory medication for at least 4 weeks, unless contraindicated or not tolerated
          b. Symptoms worsening while under treatment
          c. Pain severe enough to require opiates (narcotics) with no relief after 2 days

XI. Evaluation of recurrent symptoms after spinal surgery
    A. Evaluation of spinal fusion

XII. CT myelogram
XIII. Evaluation of pediatric spine for congenital anomalies

XIV. Inflammatory Spondylitis\textsuperscript{17-26}

A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated

References:


Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes, the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR
- Urinary tract infections
- Pain increased when supine
- Aural temperature >38.3°C or >100.9°F
- Urinary retention
- Urinary incontinence
- Decreased anal sphincter tone
- Saddle anesthesia

**Major** motor weakness of a limb found on physical examination (objectively graded as less than 3/5)

**Major** acute Trauma (This is age dependent; lesser trauma required in older patients)

I. **Back pain for 6 weeks or more and there is an absolute contraindication to MRI**
   
   A. No red flags and incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids
   
   B. Symptoms worsening while under treatment described in A
   
   C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

II. **Trauma** [One of the following]
   
   A. Back pain or midline tenderness over the thoracic spine
   
   B. Local signs of thoracolumbar injury
   
   C. Abnormal neurological signs related to the thoracic spine
   
   D. Documented cervical or thoracic spine fracture
   
   E. Major distracting injury
   
   F. Fracture on CT at different level of the spine
III. Radiculopathy or suspected spinal stenosis with symptoms present for at least 6 weeks (MRI; CT should only be performed if MRI is absolutely contraindicated) [One of the following]

Presence of red flags waives any conservative management requirements.

A. Clinical findings and symptoms which may be band like with no red flags incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or oral steroids [One of the following]
   1. Pain in nerve root distribution
   2. Numbness
   3. Tingling sensations (paresthesias)
   4. Burning sensations (dysesthesias)
   5. Shooting pain

B. Symptoms worsening while under treatment described in A

C. Candidate for surgery or epidural injection after failed conservative therapy described in A and one of the symptoms described in A

IV. Myelopathy (MRI; CT myelography should only be performed if MRI is absolutely contraindicated) (The spinal cord ends at about T12 or L1; suspicion of lumbar myelopathy is evaluated by examining the thoracic spine)

A. Symptoms and findings on examination [One of the following]
   1. Clumsiness of the hands
   2. Paresthesias of the hands
   3. Gait disturbance
   4. Lhermitte’s sign (cervical flexion and extension producing electric shocks down the arm and leg)
   5. Hoffman’s sign (evidence of upper motor neuron lesion from spinal cord compression)
   6. Neck stiffness
   7. Weakness or stiffness of the legs (objective weakness on exam that is 3/5 or less)
   8. Arm pain
   9. Bowel and bladder control problems
   10. Hyperreflexia
   11. Ankle clonus
   12. Numbness and/or tingling in the upper extremities
   13. Positive Babinski sign
   14. Loss of coordination

B. Known myelopathy including MS [One of the following]
   1. Baseline or follow-up of treatment with medication
   2. New or worsening of symptoms as in A above
   3. Annual follow-up with no change in signs or symptoms
V. Suspected malignancy5-8 (MRI; for bone, MRI without contrast and for soft tissue or tumor in the canal, MRI without and with contrast and should be done unless absolutely contraindicated)

A. Suspected primary or metastatic tumor of the cervical cord or leptomeninges (For medulloblastoma or ependymoma, see X and XI below)
   1. Symptoms or findings on examination [One of the following]
      a. Hyperreflexia
      b. Weakness of the upper or lower extremity (objective weakness on exam that is 3/5 or less)
      c. Spasticity
      d. Bladder dysfunction
      e. Bowel dysfunction
      f. Lhermitte’s sign
      g. Sensory deficit
      h. New onset scoliosis
      i. New onset kyphosis
      j. Spastic gait
      k. Radiculopathy
      l. Pain in the neck or back
      m. Localized tenderness over the spine
      n. Spinal pain interfering with sleep
      o. CSF cytology positive for malignant cells

B. Primary or metastatic bone tumor (MRI without contrast)
   1. Known malignancy with cervical spine pain
   2. Follow-up primary or metastatic bone tumor confirmed on prior imaging study
   3. New or worsening pain at site of known bone tumor
   4. Periodic assessment during chemotherapy, radiation Rx, or surgery for bone tumor
   5. Pain
   6. New onset scoliosis
   7. New onset kyphosis

VI. Infection9,10 (including osteomyelitis and discitis and epidural abscess) (MRI with and without contrast, and CT should not be done unless there is an absolute contraindication for MRI) [One of the following]

A. Osteomyelitis [One of the following]
   1. Laboratory findings [One of the following]
      a. Aural temperature >38.3°C or >100.9°F
      b. WBC >11,500/cu.mm
      c. ESR >22 mm/hr
      d. C-reactive protein >10 mg/L
      e. Blood culture positive
   2. History of infection elsewhere
   3. History of diabetes, dialysis or peripheral vascular disease
4. X-ray suggestive of osteomyelitis
5. Sinus tract, poor wound or fracture healing
6. History of penetrating injury or surgery

B. Preoperative evaluation of osteomyelitis

C. Follow-up during or after therapy for osteomyelitis, epidural abscess or disc space infection
   1. New or worsening pain at site or neurologic signs or symptoms
   2. Periodic evaluation of response to therapy

D. Suspected epidural abscess or disc space infection (MRI with contrast)
   1. Progressive neurological symptoms
      a. Radiating nerve root pain
      b. Muscle weakness
      c. Sensory deficit
   2. Risk factors
      a. Trauma
      b. Prior spinal procedure
      c. Infection elsewhere
      d. IV drug use
      e. Diabetes
      f. Immunosuppression
   3. Clinical and laboratory findings
      a. Aural temperature >38.3°C or >100.9°F
      b. WBC >11,500/cu.mm
      c. ESR >22 mm/hr
      d. C-reactive protein >10 mg/L
      e. Blood culture positive

E. Follow-up during therapy for epidural abscess or disc space infection
   1. New or worsening pain at site or neurologic signs or symptoms
   2. Periodic evaluation of response to therapy

VII. Discography
   A. To confirm that the symptoms are attributable to a particular disc prior to therapeutic intervention

VIII. Evaluation of scoliosis
   A. Preoperative assessment
   B. Any neurologic finding in the presence of scoliosis
   C. Atypical curve pattern
   D. Congenital scoliosis
   E. Neurofibromatosis
   F. Marfan’s syndrome

IX. Evaluation for possible vertebroplasty
   A. Painful osteoporotic or non neoplastic compression fracture
      1. No red flags and failure to respond to conservative medical management
a. Continued pain after anti-inflammatory medication for at least 4 weeks, unless contraindicated or not tolerated
b. Symptoms worsening while under treatment
c. Pain severe enough to require opiates (narcotics) with no relief after 2 days

X. Evaluation of recurrent symptoms after spinal surgery
   A. Evaluation of spinal fusion

XI. CT myelography

XII. Evaluation of pediatric spine for congenital anomalies

XIII. Inflammatory Spondylitis
   A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated

References:


Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:
- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR
- Urinary tract infections
- Urinary retention
- Urinary incontinence
- Decreased anal sphincter tone
- Aural temperature >38.3°C or >100.9°F
- Saddle anesthesia
- Major motor weakness of a limb found on physical examination (objectively graded as less than 3/5)
- Major acute trauma (This is age-dependent; lesser trauma required in older patients)

I. Low back pain\textsuperscript{1-5} or lumbar spine pain for at least 6 weeks (CT should only be performed if MRI is absolutely contraindicated) [One of the following]
   A. No red flags and failure to respond to conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids
   B. Symptoms worsening while under treatment described in A
   C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

II. Trauma\textsuperscript{6} (CT) [One of the following]
   A. Back pain or midline tenderness over the lumbar spine
   B. Local signs of thoracolumbar injury
   C. Abnormal neurological signs related to the lumbar spine
   D. Documented spine fracture any level
   E. Major distracting injury
III. Radiculopathy\textsuperscript{1-5,7,8} with symptoms for at least 6 weeks (MRI; CT should only be performed if MRI is absolutely contraindicated.) [One of the following]

Presence of red flags waives any conservative management requirements

A. Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]
   1. Hyporeflexia
   2. Atrophy
   3. Weakness objective (objective weakness on exam that is 3/5 or less)
   4. Pain in nerve root distribution
   5. Numbness
   6. Paresthesias (tingling sensations)
   7. Dysesthesias (burning sensations)
   8. Neurogenic claudication
   9. Pain in both legs related to nerve root distribution
   10. Bilateral buttock pain
   11. Dull fatigue in thigh and/or leg
   12. Straight-leg raising reproduces the pain between 30 and 70 degrees of leg elevation
   13. Crossed straight-leg raise test (Lasegue’s sign) reproduces the pain at 30 to 70 degrees of leg elevation

B. Symptoms worsening while under treatment as described in A

C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

IV. Spinal stenosis with pain that increases with walking for at least 6 weeks (CT should only be performed if MRI is absolutely contraindicated)\textsuperscript{7} [One of the following]

A. No red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids

B. Symptoms worsening while under treatment as described in A

C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

V. Candidate for surgery or epidural injection after failed conservative therapy (CT should only be performed if MRI is absolutely contraindicated) [One of the following]

A. Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]
   1. Hyporeflexia
   2. Atrophy
3. Weakness objective (objective weakness on exam that is 3/5 or less)
4. Pain in nerve root distribution
5. Numbness
6. Paresthesias (tingling sensations)
7. Dysesthesias (burning sensations)
8. Neurogenic claudication
9. Pain in both legs related to nerve root distribution
10. Bilateral buttock pain
11. Dull fatigue in thigh and/or leg
12. Straight-leg raising reproduces the pain between 30 and 70 degrees of leg elevation
13. Crossed straight-leg raise test (Lasegue’s sign) reproduces the pain at 30 to 70 degrees of leg elevation

B. Symptoms worsening while under treatment as described in A

VI. Suspected cauda equina syndrome\textsuperscript{1-5} (MRI of the thoracic spine without and with contrast and should be done unless there is an absolute contraindication to MRI)
A. Sudden unexplained onset of [One of the following]
   1. Saddle anesthesia
   2. Profound sensory deficit
   3. Bowel or bladder dysfunction
   4. Leg numbness and weakness
   5. Diminished rectal sphincter tone
   6. Bilateral radiculopathy
   7. Neurogenic claudication

VII. Suspected malignancy\textsuperscript{9} (MRI; for bone, MRI without contrast, and for soft tissue tumor or tumor in the spinal canal, MRI without and with contrast should be done unless there is an absolute contraindication to MRI) [One of the following]
A. Suspected primary or metastatic tumor of the spinal cord or leptomeninges (For medulloblastoma or ependymoma, see X and XI below)
   1. Symptoms or findings on examination [One of the following]
      a. Hyperreflexia
      b. Weakness of the upper or lower extremity (objective weakness on exam that is 3/5 or less)
      c. Spasticity
      d. Bladder dysfunction
      e. Bowel dysfunction
      f. Lhermitte’s sign
      g. Sensory deficit
      h. New onset scoliosis
      i. New onset kyphosis
      j. Spastic gait
      k. Radiculopathy
l. Pain in the neck or back  
m. Localized tenderness over the spine  
n. Spinal pain interfering with sleep  
o. CSF cytology positive for malignant cells  

B. Primary or metastatic bone tumor) [One of the following]  
1. Known malignancy with spine pain  
2. Follow-up primary or metastatic bone tumor confirmed on prior imaging study  
3. New or worsening pain at site of known bone tumor  
4. Periodic assessment during chemotherapy, radiation Rx, or surgery for bone tumor  
5. Pain  
6. New onset scoliosis  
7. New onset kyphosis  

VIII. Infection (MRI without and with contrast and should be performed unless there is an absolute contraindication for MRI) [One of the following]  
A. Osteomyelitis [One of the following]  
   1. Laboratory findings [One of the following]  
      a. Aural temperature >38.3°C or >100.9°F  
      b. WBC >11,500/cu.mm  
      c. ESR >22 mm/hr  
      d. C-reactive protein >10 mg/L  
      e. Blood culture positive  
   2. History of infection elsewhere  
   3. History of diabetes, dialysis or peripheral vascular disease  
   4. X-ray suggestive of osteomyelitis  
   5. Sinus tract, poor wound or fracture healing  
   6. History of penetrating injury or surgery  
B. Pre-operative evaluation of osteomyelitis  
C. Follow-up during or after therapy for osteomyelitis, epidural abscess or disc space infection [One of the following]  
   1. New or worsening pain at site or neurologic signs or symptoms  
   2. Periodic evaluation of response to therapy  
D. Suspected epidural abscess or disc space infection (MRI with contrast) [All of the following]  
   1. Progressive neurological symptoms [One of the following]  
      a. Radiating nerve root pain  
      b. Muscle weakness  
      c. Sensory deficit  
      d. Spinal pain  
   2. Risk factors [One of the following]  
      a. Trauma  
      b. Prior spinal procedure  
      c. Infection elsewhere  
      d. IV drug use
e. Diabetes
f. Immunosuppression

3. Clinical and laboratory findings [One of the following]
a. Aural temperature >38.3°C or >100.9°F
b. WBC >11,500/cu.mm
c. ESR >22 mm/hr
d. C-reactive protein > 10 mg/L
e. Blood culture positive

E. Follow-up during therapy for epidural abscess or disc space infection [One of the following]
1. New or worsening pain at site or neurologic signs or symptoms
2. Periodic evaluation of response to therapy

IX. Suspected meningocele or myelomeningocele (MRI)

X. Discography
A. To confirm that patient’s symptoms are attributable to a particular disc, prior to therapeutic intervention

XI. Tethered cord (MRI should be done unless absolutely contraindicated) [One of the following]
A. Documented Arnold-Chiari malformation
B. Symptoms [One of the following]
   1. Low back and leg pain worst in the am
   2. Spastic gait
   3. Hair tuft
   4. Dimple
   5. Hemangioma
   6. Incontinence
   7. Scoliosis
   8. Weakness of lower extremity

XII. Evaluation of recurrent symptoms after spinal surgery
A. Evaluation of spinal fusion

XIII. Evaluation for possible vertebroplasty
A. Painful osteoporotic or non-neoplastic compression fracture
   1. No red flags and failure to respond to conservative medical management [One of the following]
      a. Continued pain after anti-inflammatory medication for at least 4 weeks, unless contraindicated or not tolerated
      b. Symptoms worsening while under treatment
      c. Pain severe enough to require opiates (narcotics) with no relief after 2 days

XIV. CT myelography

XV. Evaluation of pediatric spine for congenital anomalies
XVI. Evaluation of scoliosis [One of the following]
A. Preoperative assessment
B. Any neurologic finding in the presence of scoliosis
C. Atypical curve pattern
D. Congenital scoliosis
E. Neurofibromatosis
F. Marfan’s syndrome

XVII. Inflammatory Spondylitis17-26
A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated

References:


72141 MRI Cervical Spine without Gadolinium

Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, sed rate
- Urinary tract infections
- Aural temperature >38.3°C or 100.9°F
- Urine retention
- Urine incontinence
- Decreased anal sphincter tone
- Saddle anesthesia

**Major** motor weakness of a limb found on physical examination (objectively graded as 3/5 or less)

**Major** acute trauma (This is age-dependent; lesser trauma required in older patients)

I. **Neck pain for at least 6 weeks**¹⁻⁶ (MRI without contrast unless there has been prior cervical spine surgery from a posterior approach) [One of the following]
   A. No red flags and incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids
   B. Symptoms worsening while under treatment described in A
   C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

II. **Trauma**⁷⁻¹⁰ [One of the following]
   A. Fracture by x-ray
   B. Posterior midline (bony) tenderness in the cervical spine
   C. Older than 64
   D. Paresthesias in the extremities
   E. Inability to rotate the neck actively
   F. Fracture of the spine by CT (any level)
   G. Trauma with altered mental status
   H. History of DISH (diffuse idiopathic skeletal hyperostosis) or ankylosing spondylitis
   I. Falls from height of 3 feet or 5 or more stairs
   J. Diving accident
III. Suspected tumor of bone\textsuperscript{11-17} (For cord, see 72142, 72156)

A. Primary or metastatic bone tumor (Gadolinium not required if there are no neurological signs or symptoms) [One of the following]
1. Known malignancy with cervical spine pain
2. Follow-up primary or metastatic bone tumor seen on prior imaging study
3. New or worsening pain at site of known bone tumor
4. Periodic assessment during chemotherapy, radiation Rx, or surgery for bone tumor
5. New onset scoliosis
6. New onset kyphosis

IV. Suspected or known multiple sclerosis\textsuperscript{3,18-20} (MS), myelopathy or demyelinating disease [One of the following]

A. Suspected [One of the following]
1. Clumsiness of the hands
2. Paresthesias of the hands
3. Gait disturbance
4. Lhermitte’s sign (cervical flexion and extension producing electric shocks down the arm and leg)
5. Hoffman’s sign (evidence of upper motor neuron lesion from spinal cord compression)
6. Neck stiffness
7. Weakness or stiffness of the legs (objective weakness on exam that is 3/5 or less)
8. Arm pain
9. Bowel and bladder control problems (urinary urgency or hesitancy)
10. Hyperreflexia
11. Ankle clonus
12. Numbness and/or tingling in the upper extremities
13. Positive Babinski sign
14. Loss of coordination

B. Known myelopathy including MS [One of the following]
1. Baseline or follow up of treatment with medications
2. New or worsening of symptoms as in A above
3. Annual follow up with no change in signs or symptoms

V. Spinal stenosis with symptoms for at least 6 weeks\textsuperscript{1-6} (MRI without contrast unless there has been prior cervical spine surgery from a posterior approach) [One of the following]

A. Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or oral steroids [One of the following]
1. Arm pain
2. Neck pain
3. Scapular or periscapular pain
4. Paresthesias (tingling)
5. Numbness
6. Abnormal reflexes in the arm
7. Muscle atrophy
8. Dysesthesias (burning sensation)
9. Objective weakness in a nerve root distribution on examination which is 3/5 or less

B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

VI. Radiculopathy with symptoms lasting at least 6 weeks (MRI with contrast if there has been surgery from a posterior approach) \(^{3-6,9,21-23}\)  
[One of the following]
Presence of red flags waives any conservative management requirements.
A. Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or oral steroids [One of the following]
1. Arm pain
2. Neck pain
3. Scapular or periscapular pain
4. Paresthesias (tingling)
5. Numbness
6. Weakness of the arm
7. Abnormal reflexes in the arm
8. Muscle atrophy
9. Dysesthesias (burning sensation)
10. Deltoid weakness
11. Scapular winging
12. Weakness of the muscles of the hand
13. Objective weakness in a nerve root distribution on examination which is 3/5 or less
14. Positive Spurling’s test
B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

VII. Evaluation of scoliosis \(^{24-26}\)  [One of the following]
A. Preoperative assessment
B. Any neurologic finding in the presence of scoliosis
C. Atypical curve pattern
D. Congenital scoliosis
E. Neurofibromatosis
F. Marfan’s syndrome

VIII. Infection (MRI without and with contrast is the appropriate study)
IX. Injection of contaminated steroids

X. Syringomyelia Follow-up imaging: MRI cervical spine without contrast (CPT® 72141) and MRI brain without contrast (CPT® 70551) and/or MRI thoracic spine without contrast (CPT® 72146) when involved²⁷

A. If there is a concern for malignancy, imaging can be performed with and without contrast
B. Annual imaging until non-progression of the syringomyelia is established
C. Following surgical treatment (including posterior fossa decompression)
D. Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established
E. Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration
F. Repeat advanced diagnostic imaging in spinal cord injury patients with post-traumatic syrinx is not appropriate without evidence of neurologic deterioration.

XI. Inflammatory Spondylitis²⁸-³⁷

A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated

References:


72141 MRI Cervical Spine without Gadolinium
Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR
- Urinary tract infections
- Urinary retention
- Urinary incontinence
- Decreased anal sphincter tone
- Aural temperature >38.3°C or >100.9°F
- Saddle anesthesia
- Major motor weakness of a limb found on physical examination (objectively graded as 3/5 or less)
- Major acute trauma (This is age-dependent; lesser trauma required in older patients)

I. Suspected tumor of the cervical spinal cord or meninges

A. Suspected primary or metastatic tumor of the cervical cord or leptomeninges (For medulloblastoma or ependymoma see II and III below) [One of the following]
   1. Symptoms or findings on examination [One of the following]
      a. Hyperreflexia
      b. Weakness of the upper or lower extremity (objective weakness on exam that is 3/5 or less)
      c. Spasticity
      d. Bladder dysfunction
      e. Bowel dysfunction
      f. Lhermitte’s sign
      g. Sensory deficit
      h. New onset scoliosis
      i. New onset kyphosis
      j. Spastic gait
      k. Radiculopathy
      l. Localized tenderness over the spine
      m. Pain increased with straining
n. Spinal pain interfering with sleep
o. CSF cytology positive for malignant cells

2. Periodic assessment during or after chemotherapy or radiation therapy for known tumor in the spinal canal not more frequently than once every 3 months unless there are new or worsening symptoms (See A1 above)

II. **Medulloblastoma**\(^{3-6}\) [One of the following]
A. Initial evaluation
B. Follow-up every 3 months for 2 years then every 6 months for 2 years and then annually if previously known spine involvement
C. New or worsening signs or symptoms
D. Evaluation after completion of chemotherapy or radiation therapy

III. **Ependymoma**\(^{6}\) [One of the following]
A. Initial evaluation
B. Follow-up intervals at every 3-4 months for a year and then every 4-6 months for year 2 and every 6-12 months thereafter if previously known spine involvement
C. New or worsening signs or symptoms
D. Evaluation after completion of chemotherapy or radiation therapy

IV. **Known multiple sclerosis**\(^{7-10}\) (MS) [One of the following]
A. New symptoms in an individual with an established diagnosis of MS [One of the following]
   1. Clumsiness of the hands
   2. Paresthesias of the hands
   3. Gait disturbance
   4. Lhermitte’s sign (cervical flexion and extension producing electric shocks down the arm and leg)
   5. Hoffman’s sign (evidence of upper motor neuron lesion from spinal cord compression)
   6. Neck stiffness
   7. Weakness or stiffness of the legs
   8. Arm pain
   9. Bowel and/or bladder control problems (retention or incontinence)
   10. Hyperreflexia
   11. Ankle clonus
   12. Numbness and/or tingling in the upper extremities
   13. Positive Babinski sign
   14. Loss of coordination
B. Surveillance [One of the following]
   1. Baseline or follow up of treatment with medication
   2. New or worsening of symptoms as in A above
   3. Annual follow-up with no change in signs and symptoms

V. **Myelopathy**\(^{7-10}\) [One of the following]
A. Sensory, motor, or autonomic function is impaired [One of the following]
   1. Clumsiness of the hands
2. Paresthesias
3. Gait disturbance
4. Lhermitte’s sign (cervical flexion and extension producing electric shocks down the arm and leg)
5. Hoffman’s sign (evidence of upper motor neuron lesion from spinal cord compression)
6. Neck stiffness
7. Weakness or stiffness of the legs (objective weakness on exam that is 3/5 or less)
8. Arm pain or shoulder pain
9. Bowel and bladder control problems (retention or incontinence)
10. Hyperreflexia
11. Atrophy of the hand musculature
12. Ankle clonus
13. History of spinal cord trauma

B. Known multiple sclerosis (See IV above)
C. Syrinx or syringomyelia [One of the following]
   1. Known Chiari type 1 malformation
   2. Asymmetric sensory loss
   3. Objective weakness in arms (objective weakness on exam that is 3/5 or less)
   4. Decreased or absent reflexes
   5. Facial pain and numbness
   6. Scoliosis
   7. Muscle atrophy in the extremities
   8. Spasticity
   9. Tingling in the arms and hands
   10. Known syrinx and history or suspicion of spinal trauma, myelitis, or spinal cord tumor

VI. Infection (including osteomyelitis and discitis and epidural abscess)\textsuperscript{11-16}[One of the following]
A. Osteomyelitis [One of the following]
   1. Laboratory findings [One of the following]
      a. Aural temperature $>$38.3°C or $>$100.9°F
      b. WBC $>$11,500/cu.mm
      c. ESR $>$22 mm/hr
      d. C-reactive protein $>$10 mg/L
      e. Blood culture positive
   2. History of infection elsewhere
   3. History of diabetes, dialysis or peripheral vascular disease
   4. X-ray suggestive of osteomyelitis
   5. Sinus tract, poor wound or fracture healing
   6. History of penetrating injury or surgery
B. Pre-operative evaluation of osteomyelitis
C. Follow-up during or after therapy for osteomyelitis, epidural abscess or disc space infection [One of the following]
1. New or worsening pain at site or neurologic signs or symptoms
2. Periodic evaluation of response to therapy

D. Suspected epidural abscess or disc space infection (MRI with gadolinium) [All of the following]
   1. Progressive neurological symptoms [One of the following]
      a. Radiating nerve root pain
      b. Muscle weakness
      c. Sensory deficit
   2. Risk factors [One of the following]
      a. Trauma
      b. Prior spinal procedure
      c. Infection elsewhere
      d. IV drug use
      e. Diabetes
      f. Immunosuppression
   3. Clinical and laboratory findings [One of the following]
      a. Aural temperature >38.3°C or >100.9°F
      b. WBC >11,500/cu.mm
      c. ESR >22 mm/hr
      d. C-reactive protein >10 mg/L
      e. Blood culture positive

E. Follow-up during therapy for epidural abscess or disc space infection [One of the following]
   1. New or worsening pain at site or neurologic signs or symptoms
   2. Periodic evaluation of response to therapy

VII. Brachial plexus17,18 [One of the following]

A. Brachial plexus injury [Both of the following]
   1. Symptoms [One of the following]
      a. Weakness or paralysis of the upper extremity
      b. Sensory loss or numbness of the upper extremity
      c. Horner’s syndrome
      d. Shoulder and/or arm pain
      e. Burning or electric sensation in more than one nerve distribution
      f. Loss of deep tendon reflexes in the upper extremity
      g. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels
   2. History [One of the following]
      a. Trauma including birth trauma, drive motor vehicle accident, falls, sports injuries, gunshot injury, overuse of back packs
      b. Radiation fibrosis
      c. History of radiation therapy to the chest, breast or axilla

B. Primary or metastatic tumor [Both of the following]
   1. Symptoms [One of the following]
      a. Weakness or paralysis of the upper extremity
      b. Sensory loss or numbness of the upper extremity
      c. Horner’s syndrome
d. Shoulder and/or arm pain  
e. Burning or electric sensation in more than one nerve distribution  
f. Loss of deep tendon reflexes in the upper extremity  
g. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels  

2. History [One of the following]  
a. Known primary tumor  
b. Lung cancer especially a Pancoast tumor  
c. Lymphoma  

C. Schwannoma or neurofibroma  
1. Symptoms [One of the following]  
a. Palpable mass in the lower neck or supraclavicular fossa  
b. Weakness or paralysis of the upper extremity  
c. Sensory loss or numbness in the upper extremity  
d. Horner’s syndrome  
e. Shoulder and/or arm pain  
f. Burning or electric sensation in more than one nerve distribution  
g. Loss of deep tendon reflexes in the upper extremity  
h. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels  

D. Entrapment  
1. Symptoms [One of the following]  
a. Pain and paresthesia along the ulna aspect of the forearm, hand and 4th and 5th fingers  
b. Symptoms increase with overhead activities  

VIII. Syrinx or syringomyelia [One of the following]  
A. Known Chiari type malformation  
B. Asymmetric sensory loss  
C. Objective weakness in arms [Objective weakness on exam that is 3/5 or less]  
D. Decreased or absent reflexes  
E. Facial pain and numbness  
F. Scoliosis  
G. Muscle atrophy in the extremities  
H. Spasticity  
I. Loss of bladder and bowel control  
J. Tingling in the arms and hands  
K. Known syrinx and history or suspicion of spinal trauma, myelitis, or spinal cord tumor [One of the following]  
1. History of myelitis  
2. History of spinal cord tumor  
3. History of spinal cord trauma
IX. Radiculopathy with symptoms lasting at least 6 weeks and a history of prior surgery with a posterior approach9,19-27 [One of the following]
A. Clinical findings and/or symptoms with no red flags; failure to respond to conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]
1. Arm pain
2. Neck pain
3. Scapular or periscapular pain
4. Paresthesias (tingling)
5. Numbness
6. Weakness of the arm
7. Abnormal reflexes in the arm
8. Muscle atrophy
9. Dysesthesias (burning sensation)
10. Deltoid weakness
11. Scapular winging
12. Weakness of the muscles of the hand
13. Objective weakness in a nerve root distribution on examination which is 3/5 or less
14. Positive Spurling’s test
B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

X. Spinal stenosis with symptoms for at least 6 weeks1-6 (MRI without contrast unless there has been prior cervical spine surgery from a posterior approach) [One of the following]
A. Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or oral steroids [One of the following]
1. Arm pain
2. Neck pain
3. Scapular or periscapular pain
4. Paresthesias (tingling)
5. Numbness
6. Abnormal reflexes in the arm
7. Muscle atrophy
8. Dysesthesias (burning sensation)
9. Objective weakness in a nerve root distribution on examination which is 3/5 or less
B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A
XI. Neck pain lasting at least 6 weeks and with a history of prior surgery with a posterior approach\textsuperscript{9,19-27}[One of the following]
A. No red flags and failure to respond to conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids
B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

XII. Injection of contaminated steroids

XIII. Neurofibromatosis\textsuperscript{28-31}[One of the following]
A. Scoliosis
B. Peripheral neurofibromas (2 or more)
C. Hearing loss
D. Brain tumor
E. Spinal cord tumor
F. New onset of [One of the following]
   1. Sensory loss
   2. Motor deficit
   3. Incoordination
   4. Bladder or bowel dysfunction

XIV. Chiari Malformation\textsuperscript{32}
A. For Chiari malformation, MRI head contrast (CPT\textsuperscript{®} 70551) is appropriate
B. Once Chiari malformation has been identified, there may be a need to:
   1. Exclude syrinx
      a. MRI cervical spine without and with contrast (CPT\textsuperscript{®} 72156) and MRI thoracic spine without and with contrast (CPT\textsuperscript{®} 72157)
   2. Follow-up hydro/syringomyelia
      a. MRI spine studies without and with contrast (is superior to spine CT)
      b. Annual imaging until non-progression of the syringomyelia is established
      c. Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established
      d. Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration
      e. Head or neck MRA and CTA are not needed in the evaluation of syringomyelia unless ordered by the operating surgeon for preoperative planning.
   3. Evaluate for hydrocephalus with CSF flow studies. There is no unique CPT\textsuperscript{®} code to report a CSF flow study; it is performed as a sequence during a MRI head without contrast (CPT\textsuperscript{®} 70551). No separate code should be assigned
   4. Repeat MRI head without contrast (CPT\textsuperscript{®} 70551) is not needed unless there are increasing symptoms or signs, or it is to be used as a preoperative study
5. Perform an MRI lumbar spine if there is concern for other associated congenital abnormalities such as tethered cord.

C. Chiari malformation is not itself familial and family screening of asymptomatic individuals is not appropriate.

XV. Inflammatory Spondylitis

A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated.

References:


72142, 72156 MRI of the Cervical Spine
Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR
- Urinary tract infections
- Urinary incontinence
- Urinary retention
- Decreased anal sphincter tone
- Aural temperature > 38.3°C or >100.9°F
- Saddle anesthesia
- Major motor weakness of a limb found on physical examination (objective)
- Major acute trauma (This is age-dependent; lesser trauma required in older patients)

I. Back pain for at least 6 weeks [One of the following] (MRI without and with contrast if there is a history of thoracic spine surgery)
   A. No red flags and incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids
   B. Symptoms worsening while under treatment described in A
   C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

II. Trauma\textsuperscript{2,3} [One of the following]
   A. Back pain or midline tenderness over the thoracic spine
   B. Local signs of thoracolumbar injury
   C. Abnormal neurological signs related to the thoracic spine
   D. Documented cervical or lumbar spine fracture
   E. Major distracting injury
   F. Fracture by x-ray or CT at other level of the spine

III. Suspected bone tumor\textsuperscript{4-11} (For tumors of the thoracic cord, see MRI of the thoracic spine without and with contrast, 72157)
   A. Primary or metastatic bone tumor (contrast not required if there are no neurological signs or symptoms) [One of the following]
      1. Known malignancy with thoracic spine pain
2. Follow-up primary or metastatic bone tumor confirmed on prior imaging study
3. New or worsening pain at site of known bone tumor
4. Periodic assessment during chemotherapy, radiation Rx, or surgery for bone tumor
5. New pain in the mid back
6. New onset scoliosis
7. New onset kyphosis

IV. Suspected or known multiple sclerosis (MS), myelopathy or demyelinating disease\textsuperscript{12-14} (The spinal cord ends at about T12 or L1. Suspicion of lumbar myelopathy is evaluated by examining the thoracic spine)

A. Suspected [One of the following]
   1. Clumsiness of the hands
   2. Paresthesias of the hands
   3. Gait disturbance
   4. Lhermitte’s sign (cervical flexion and extension producing electric shocks down the arm and leg)
   5. Hoffman’s sign (evidence of upper motor neuron lesion from spinal cord compression)
   6. Neck stiffness
   7. Weakness or stiffness of the legs (objective weakness on exam that is 3/5 or less)
   8. Arm pain
   9. Bowel and bladder control problems
   10. Hyperreflexia
   11. Ankle clonus
   12. Numbness and/or tingling in the upper extremities
   13. Positive Babinski sign
   14. Loss of coordination

B. Known myelopathy including MS [One of the following]
   1. Baseline or follow up of treatment with medication
   2. New or worsening of symptoms as in A above
   3. Follow up of treatment with member on medication
   4. Annual follow-up with no change in signs or symptoms

V. Spinal stenosis with symptoms for at least 6 weeks (Contrast should be used if there is history of thoracic spine surgery) [One of the following]

Presence of red flags waives any conservative management requirements

A. Clinical findings and symptoms with no red flags incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids injections [One of the following]
1. Pain in nerve root distribution which may be band-like spanning the chest wall
2. Pain referred to retrogastric or retrosternal areas
3. Numbness
4. Tingling sensations (paresthesias)
5. Burning sensations (dysesthesias)
B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

VI. **Radiculopathy**\(^{15}\) with symptoms for at least 6 weeks (MRI without and with contrast if there is a history of thoracic spine surgery) [One of the following]
   Presence of red flags waives any conservative management requirements
   A. Clinical findings and symptoms with no red flags incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or oral steroids [One of the following]
      1. Pain in nerve root distribution which may be band like spanning the chest wall
      2. Pain referred to retrogastric or retrosternal areas
      3. Numbness
      4. Tingling sensations (paresthesias)
      5. Burning sensations (dysesthesias)
   B. Symptoms worsening while under treatment described in A
   C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

VII. **Evaluation of scoliosis**\(^{16-18}\)
   A. Preoperative assessment
   B. Any neurologic finding in the presence of scoliosis
   C. Atypical curve pattern
   D. Congenital scoliosis
   E. Neurofibromatosis
   F. Marfan’s syndrome

VIII. **Evaluation for possible vertebroplasty**\(^{19,20}\)
   A. Painful osteoporotic or neoplastic compression fracture or microfracture documented by MRI and/or a lytic lesion on CT without decreased height of a vertebra which is refractory to medical therapy as defined as one of the following
      1. Pain from a weakened or fractured vertebral body that renders an individual nonambulatory despite 24 hours of analgesic therapy
      2. Pain from a weakened or fractured vertebral body that prevents an individual from participating in physical therapy despite 24 hours of analgesic therapy
3. Member with weakened or fractured vertebra that develops confusion, sedation or constipation from analgesic therapy

IX. Infection (MRI of the thoracic spine without and with contrast)

X. Syringomyelia Follow-up imaging: MRI cervical spine without contrast (CPT® 72141) and MRI brain without contrast (CPT® 70551) and/or MRI thoracic spine without contrast (CPT® 72146) when involved

A. If there is a concern for malignancy, imaging can be performed with and without contrast

B. Annual imaging until non-progression of the syringomyelia is established

C. Following surgical treatment (including posterior fossa decompression)

D. Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established

E. Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration

F. Repeat advanced diagnostic imaging in spinal cord injury patients with post-traumatic syrinx is not appropriate without evidence of neurological deterioration

XI. Inflammatory Spondylitis

A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated

References:


Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR
- Urinary tract infections
- Pain increased when supine
- Urinary retention
- Urinary incontinence
- Decreased anal sphincter tone
- Aural temperature >38.3°C or >100.9°F
- Saddle anesthesia

**Major** motor weakness of a limb on physical examination (objective)

**Major** acute trauma (This is age-dependent; lesser trauma required in older patients)

I. **Suspected tumor of the thoracic spinal cord or meninges**¹-⁶
A. Suspected primary or metastatic tumor of the thoracic cord or leptomeninges

[One of the following]

1. Symptoms or findings on examination with or without personal history of cancer

   [One of the following]
   a. Hyperreflexia
   b. Weakness of the lower extremities
   c. Spasticity
   d. Bladder dysfunction
   e. Bowel dysfunction
   f. Sensory loss
   g. New onset scoliosis
   h. New onset kyphosis
   i. Spastic gait
   j. Radiculopathy
   k. Localized tenderness over the spine
   l. Pain
   m. Spinal pain interfering with sleep
   n. CSF cytology positive for malignant cells
II. Medulloblastoma\(^{3,6}\) [One of the following]
A. Initial evaluation
B. Follow-up every 3 months for 2 years then every 6 months for 2 years and then annually if there is previously known spine disease
C. New or worsening signs or symptoms
D. Evaluation after completion of chemotherapy or radiation therapy

III. Ependymoma\(^{6}\) [One of the following]
A. Initial evaluation
B. Follow-up intervals at every 3-4 months for a year and then every 4-6 months for year 2 and every 6-12 months thereafter if there is previously known spine disease
C. New or worsening of symptoms
D. Evaluation after completion of chemotherapy or radiation therapy

IV. Known multiple sclerosis (MS)\(^{7-9}\) [One of the following]
A. New symptoms in an individual with an established diagnosis of MS [One of the following]
   1. Clumsiness of the hands
   2. Paresthesias of the hands
   3. Gait disturbance
   4. Lhermitte’s sign (cervical flexion and extension producing electric shocks down the arm and leg)
   5. Hoffman’s sign (evidence of upper motor neuron lesion from spinal cord compression)
   6. Neck stiffness
   7. Weakness or stiffness of the legs (objective weakness on exam that is 3/5 or less)
   8. Arm pain
   9. Bowel and bladder control problems
   10. Hyperreflexia
   11. Ankle clonus
   12. Numbness and/or tingling in the upper extremities
   13. Positive Babinski sign
   14. Loss of coordination
B. Surveillance [One of the following]
   1. Follow up of treatment medication
   2. New or worsening of symptoms as in A above
   3. Annual follow-up with no change in signs and symptoms

V. Myelopathy\(^{7-9,22}\) [One of the following]
A. Sensory, motor, or autonomic function is impaired [One of the following]
   1. Radiculopathy
   2. Bowel and/or bladder control problems (retention or incontinence)
   3. Hyperreflexia
   4. Ankle clonus
   5. Spasticity
6. Objective weakness or stiffness of the legs
7. Numbness or tingling of the legs
8. Loss of coordination
9. Positive Babinski sign
10. Paresthesias
11. Gait disturbance

B. Known multiple sclerosis (See IV above)

C. Syrinx or syringomyelia [One of the following]
   1. Known Chiari type 1 malformation
   2. Asymmetric sensory loss
   3. Decreased or absent reflexes
   4. Scoliosis
   5. Muscle atrophy in the extremities
   6. Spasticity
   7. Tingling in the legs
   8. Known syrinx and history or suspicion of spinal trauma, myelitis, or spinal cord tumor
   9. MRI of the thoracic spine without and with contrast (CPT® 72157) to define the lower most extent of the syrinx or to identify a skip lesion

VI. Infection\(^{16-15}\) (including osteomyelitis and discitis and epidural abscess) [One of the following]

A. Osteomyelitis [One of the following]
   1. Laboratory findings [One of the following]
      a. Aural temperature >38.3°C or >100.9°F
      b. WBC >11,500/cu.mm
      c. ESR >22 mm/hr
      d. C-reactive protein >10 mg/L
      e. Blood culture positive
   2. History of infection elsewhere
   3. History of diabetes, dialysis or peripheral vascular disease
   4. X-ray suggestive of osteomyelitis
   5. Sinus tract, poor wound or fracture healing
   6. History of penetrating injury or surgery

B. Pre-operative evaluation of osteomyelitis

C. Follow-up during or after therapy for osteomyelitis, epidural abscess or disc space infection [One of the following]
   1. New or worsening pain at site or neurologic signs or symptoms
   2. Periodic evaluation of response to therapy

D. Suspected epidural abscess or disc space infection (MRI with contrast) [All of the following]
   1. Progressive neurological symptoms [One of the following]
      a. Radiating nerve root pain
      b. Muscle weakness
      c. Sensory deficit
   2. Risk factors [One of the following]
      a. Trauma
b. Prior spinal procedure  
c. Infection elsewhere  
d. IV drug use  
e. Diabetes  
f. Immunosuppression  

3. Clinical and laboratory findings [One of the following]  
   a. Aural temperature >38.3°C or >100.9°F  
   b. WBC >11,500/cu.mm  
   c. ESR >22 mm/hr  
   d. C-reactive protein >10 mg/L  
   e. Blood culture positive  

E. Follow-up during therapy for epidural abscess or disc space infection [One of the following]  
   1. New or worsening pain at site or neurologic signs or symptoms  
   2. Periodic evaluation of response to therapy  

VII. Neurofibromatosis^{16-19} (MRI without and with contrast) [One of the following]  
   A. Scoliosis  
   B. Peripheral neurofibromas (2 or more)  
   C. Hearing loss  
   D. Brain tumor  
   E. Spinal cord tumor  
   F. New onset of [One of the following]  
      1. Sensory loss  
      2. Motor deficit  
      3. Incoordination  
      4. Bladder or bowel dysfunction  

VIII. Radiculopathy^{20} with symptoms for at least 6 weeks (MRI without and with contrast if there is a history of thoracic spine surgery) [One of the following]  
   Presence of red flags waives any conservative management requirements.  
   A. Clinical findings and symptoms with no red flags incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants or a course of steroids [One of the following]  
      1. Pain in nerve root distribution which may be band like spanning the chest wall  
      2. Pain referred to retrogastric or retrosternal areas  
      3. Numbness  
      4. Tingling sensations (paresthesias)  
      5. Burning sensations (dysesthesias)  
   B. Symptoms worsening while under treatment described in A  
   C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A
IX. **Spinal stenosis with symptoms for at least 6 weeks [One of the following]**

Presence of red flags waives any conservative management requirements

A. Clinical findings and symptoms with no red flags incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids injections [One of the following]
   1. Pain in nerve root distribution which may be band-like spanning the chest wall
   2. Pain referred to retrogastric or retrosternal areas
   3. Numbness
   4. Tingling sensations (paresthesias)
   5. Burning sensations (dysesthesias)

B. Symptoms worsening while under treatment described in A

C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

X. **Chiari Malformation**

A. For Chiari malformation, MRI head contrast (CPT® 70551) is appropriate

B. Once Chiari malformation has been identified, there may be a need to:
   1. Exclude syrinx
      a. MRI cervical spine without and with contrast (CPT® 72156) and MRI thoracic spine without and with contrast (CPT® 72157)
   2. Follow-up hydro/syringomyelia
      a. MRI spine studies without and with contrast (is superior to spine CT)
      b. Annual imaging until non-progression of the syringomyelia is established
      c. Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established
      d. Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration
      e. Head or neck MRA and CTA are not needed in the evaluation of syringomyelia unless ordered by the operating surgeon for preoperative planning.
   3. Evaluate for hydrocephalus with CSF flow studies. There is no unique CPT® code to report a CSF flow study; it is performed as a sequence during a MRI head without contrast (CPT® 70551). No separate code should be assigned
   4. Repeat MRI head without contrast (CPT® 70551) is not needed unless there are increasing symptoms or signs, or it is to be used as a preoperative study
   5. Perform an MRI lumbar spine if there is concern for other associated congenital abnormalities such as tethered cord

C. Chiari malformation is not itself familial and family screening of asymptomatic individuals is not appropriate.
XI. **Inflammatory Spondylitis**22-31

A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated

**References:**


72147, 72157 MRI Thoracic Spine
72148 MRI Lumbar Spine without Gadolinium

Imaging of the lumbar spine should be performed in patients with persistent low back pain and signs of radiculopathy or spinal stenosis only if they are candidates for either surgery or epidural steroid injections.

Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes, the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR, etc
- Urinary tract infections
- Aural temperature >38.3°C or >100.9°F
- Urinary incontinence
- Urinary retention
- Decreased anal sphincter tone
- Saddle anesthesia
- **Major** motor weakness of a limb found on physical examination (objective)
- **Major** acute trauma (This is age-dependent; lesser trauma required in older patients)

I. Back pain\(^{1-7}\) for at least 6 weeks (Contrast should be used if there is a history of lumbar spine surgery) [One of the following]
A. No red flags and incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids
B. Symptoms worsening while under treatment described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

II. Trauma\(^{8}\) [One of the following] (CT)
A. Back pain or midline tenderness over the lumbar spine
B. Local signs of thoracolumbar injury
C. Abnormal neurological signs related to the lumbar spine
D. Documented spine fracture any level
E. Major distracting injury
III. Radiculopathy with symptoms for at least 6 weeks (Contrast should be used if there is a history of lumbar spine surgery) [One of the following]

- Presence of red flags waives any conservative management requirements.
  - Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]
    1. Hyporeflexia
    2. Atrophy
    3. Weakness objective (objective weakness on exam that is 3/5 or less)
    4. Pain in nerve root distribution
    5. Numbness
    6. Paresthesias (tingling sensations)
    7. Dysesthesias (burning sensations)
    8. Neurogenic claudication
    9. Pain in both legs related to nerve root distribution
    10. Bilateral buttock pain
    11. Dull fatigue in thigh and/or leg
    12. Straight-leg raising reproduces the pain between 30 and 70 degrees of leg elevation
    13. Crossed straight-leg raise test (Lasègue’s sign) reproduces the pain at 30 to 70 degrees of leg elevation

- Symptoms worsening while under treatment as described in A

- Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

IV. Candidate for surgery or epidural injection after failed conservative therapy (CT should only be performed if MRI is absolutely contraindicated) [One of the following]

- Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]
  1. Hyporeflexia
  2. Atrophy
  3. Weakness objective (objective weakness on exam that is 3/5 or less)
  4. Pain in nerve root distribution
  5. Numbness
  6. Paresthesias (tingling sensations)
  7. Dysesthesias (burning sensations)
  8. Neurogenic claudication
  9. Pain in both legs related to nerve root distribution
  10. Bilateral buttock pain
  11. Dull fatigue in thigh and/or leg
12. Straight-leg raising reproduces the pain between 30 and 70 degrees of leg elevation.
13. Crossed straight-leg raise test (Lasègue’s sign) reproduces the pain at 30 to 70 degrees of leg elevation.

B. Symptoms worsening while under treatment as described in A

V. Suspected spinal stenosis with back pain that increases with walking for at least 6 weeks (Contrast should be used if there is a history of lumbar spine surgery) [One of the following]
Presence of red flags waives any conservative management requirements.
A. No red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids
B. Symptoms worsening while under treatment as described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

VI. Suspected meningocele or myelomeningocele [One of the following]
A. Congenital
B. After lumbar surgery

VII. Evaluation of scoliosis [One of the following]
A. Preoperative assessment
B. Any neurologic finding in the presence of scoliosis
C. Atypical curve pattern
D. Congenital scoliosis
E. Neurofibromatosis
F. Marfan’s syndrome

VIII. Tethered cord [One of the following]
A. Documented Arnold-Chiari malformation
B. Symptoms [One of the following]
   1. Low back and leg pain worst in the morning
   2. Spastic gait
   3. Hair tuft
   4. Dimple
   5. Hemangioma
   6. Incontinence
   7. Scoliosis
   8. Weakness of lower extremity
   9. Lower extremity weakness (objective)
   10. Muscle atrophy
   11. Hyporeflexia
IX. Suspected or known malignancy of vertebra or bone\textsuperscript{15-21} (MRI; for bone, MRI without contrast and for soft tissue or tumor in the canal, MRI without and with contrast and should be done unless absolutely contraindicated)

A. Primary or metastatic bone tumor (MRI without contrast) [One of the following]
   1. Known malignancy with cervical spine pain
   2. Follow-up primary or metastatic bone tumor confirmed on prior imaging study
   3. New or worsening pain at site of known bone tumor
   4. Periodic assessment during chemotherapy, radiation Rx, or surgery for bone tumor
   5. Pain
   6. New onset scoliosis
   7. New onset kyphosis

X. Evaluation for possible vertebroplasty\textsuperscript{22,23}

A. Painful osteoporotic or neoplastic compression fracture or microfracture documented by MRI and/or a lytic lesion on CT without decreased height of a vertebra which is refractory to medical therapy as defined as one of the following
   1. Pain from a weakened or fractured vertebral body that renders an individual nonambulatory despite 24 hours of analgesic therapy
   2. Pain from a weakened or fractured vertebral body that prevents an individual from participating in physical therapy despite 24 hours of analgesic therapy
   3. Member with weakened or fractured vertebra that develops confusion, sedation or constipation from analgesic therapy

XI. Infection (MRI without and with contrast)

XII. Evaluation of pediatric spine for congenital anomalies

XIII. Inflammatory Spondylitis\textsuperscript{24-33}

A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated
References:

http://www.nccn.org/professionals/physician_gls/pdf/cns.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Central Nervous System Cancers V1.2014. ©2014 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.

72148 MRI Lumbar Spine without Gadolinium

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Red Flags
If any of the following are part of the clinical history presented with a request for pre-certification of these CPT codes, the need to meet criteria concerning prior conservative management is waived and the examinations should be pre-certified if other criteria are met:

- History of cancer
- Unexplained weight loss
- Immunocompromised
- IV drug use
- Abnormal CBC, ESR
- Urinary tract infections
- Urinary retention
- Urinary incontinence
- Decreased anal sphincter tone
- Aural temperature >38.3°C or >100.9°F
- Saddle anesthesia

**Major** motor weakness of a limb found on physical examination (objectively graded 3/5 or less)

**Major** acute trauma (This is age-dependent; lesser trauma required in older patients)

I. Uncomplicated back pain\(^1-7\) lasting more than 6 weeks with a history of lumbar spine (Contrast should be used if there is history of lumbar spine surgery) [One of the following]

A. No red flags and incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks or a course of oral steroids

B. Symptoms worsening while under treatment described in A

C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

II. Radiculopathy\(^1-7\) lasting for at least 6 weeks with a history of lumbar spine surgery (Contrast should be used if there is history of lumbar spine surgery) [One of the following]

Presence of red flags waives any conservative management requirements.

A. Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]

1. Hyporeflexia
2. Atrophy
3. Weakness objective (objective weakness on exam that is 3/5 or less)
4. Pain in nerve root distribution
5. Numbness
6. Paresthesias (tingling sensations)
7. Dysesthesias (burning sensations)
8. Neurogenic claudication
9. Pain in both legs related to nerve root distribution
10. Bilateral buttock pain
11. Dull fatigue in thigh and/or leg
12. Straight-leg raising reproduces the pain between 30 and 70 degrees of leg elevation
13. Crossed straight-leg raise test (Lasègue’s sign) reproduces the pain at 30 to 70 degrees of leg elevation

B. Symptoms worsening while under treatment as described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A and one of the symptoms described in A

III. **Candidate for surgery or epidural injection after failed conservative therapy** (Contrast should be used if there is history of lumbar spine surgery) [One of the following]
A. Clinical findings and/or symptoms with no red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids [One of the following]
   1. Hyporeflexia
   2. Atrophy
   3. Weakness objective (objective weakness on exam that is 3/5 or less)
   4. Pain in nerve root distribution
   5. Numbness
   6. Paresthesias (tingling sensations)
   7. Dysesthesias (burning sensations)
   8. Neurogenic claudication
   9. Pain in both legs related to nerve root distribution
   10. Bilateral buttock pain
   11. Dull fatigue in thigh and/or leg
   12. Straight-leg raising reproduces the pain between 30 and 70 degrees of leg elevation
   13. Crossed straight-leg raise test (Lasègue’s sign) reproduces the pain at 30 to 70 degrees of leg elevation
B. Symptoms worsening while under treatment as described in A

IV. **Spinal stenosis**\(^4,6,8\) with pain that increases with walking for at least 6 weeks (Contrast should be used if there is history of lumbar spine surgery) Presence of red flags waives any conservative management requirements.
A. No red flags; incomplete resolution with conservative medical management consisting of either treatment with anti-inflammatory medication or muscle relaxants for at least 6 weeks; or a course of oral steroids
B. Symptoms worsening while under treatment as described in A
C. Candidate for surgery or epidural injection after failed conservative therapy as described in A

V. Cauda equina syndrome¹,²,⁴ (Contrast is indicated if there is suspicion of tumor or infection)
A. Sudden unexplained onset of [One of the following]
   1. Saddle anesthesia
   2. Profound sensory deficit
   3. Bowel or bladder dysfunction
   4. Severe motor deficit (objective weakness on exam that is 3/5 or less)
   5. Diminished rectal sphincter tone
   6. Bilateral radiculopathy
   7. Neurogenic claudication

VI. Tumor of leptomeninges⁹-¹⁷
A. Suspected primary or metastatic tumor of the leptomeninges [One of the following]
   1. Symptoms or findings on examination with or without personal history of cancer [One of the following]
      a. Hyperreflexia
      b. Weakness of the lower extremities
      c. Spasticity
      d. Bladder dysfunction
      e. Bowel dysfunction
      f. Sensory loss
      g. New onset scoliosis
      h. New onset kyphosis
      i. Spastic gait
      j. Radiculopathy
      k. Localized tenderness over the spine
      l. Pain
      m. Spinal pain interfering with sleep
      n. CSF cytology positive for malignant cells

VII. Infection¹⁸-²² (including osteomyelitis and discitis and epidural abscess)[One of the following]
A. Osteomyelitis [One of the following]
   1. Laboratory findings [One of the following]
      a. Aural temperature >38.3°C or >100.9°F
      b. WBC >11,500/cu.mm
      c. ESR >22 mm/hr
      d. C-reactive protein >10 mg/L
      e. Blood culture positive
2. History of infection elsewhere
3. History of diabetes, dialysis or peripheral vascular disease
4. X-ray suggestive of osteomyelitis
5. Sinus tract, poor wound or fracture healing
6. History of penetrating injury or surgery

B. Pre-operative evaluation of osteomyelitis

C. Follow-up during or after therapy for osteomyelitis, epidural abscess or disc space infection [One of the following]
   1. New or worsening pain at site or neurologic signs or symptoms
   2. Periodic evaluation of response to therapy

D. Suspected epidural abscess or disc space infection) [All of the following]
   1. Progressive neurological symptoms [One of the following]
      a. Radiating nerve root pain
      b. Muscle weakness
      c. Sensory deficit
   2. Risk factors [One of the following]
      a. Trauma
      b. Prior spinal procedure
      c. Infection elsewhere
      d. IV drug use
      e. Diabetes
      f. Immunosuppression
   3. Clinical and laboratory findings [One of the following]
      a. Aural temperature >38.3°C or >100.9°F
      b. WBC >11,500/cu.mm
      c. ESR >22 mm/hr
      d. C-reactive protein >10 mg/L
      e. Blood culture positive

E. Follow-up during therapy for epidural abscess or disc space infection [One of the following]
   1. New or worsening pain at site or neurologic signs or symptoms
   2. Periodic evaluation of response to therapy

VIII. Medulloblastoma

A. Initial evaluation

B. Follow-up every 3 months for 2 years then every 6 months for 2 years and then annually if there is known spine disease

C. New or worsening signs or symptoms

D. Evaluation after completion of chemotherapy or radiation therapy

IX. Ependymoma

A. Initial evaluation

B. Follow-up intervals at every 3-4 months for a year and then every 4-6 months for year 2 and every 6-12 months thereafter if there is known spine disease

C. New or worsening of symptoms

D. Evaluation after completion of chemotherapy or radiation therapy

X. Neurofibromatosis

A. Initial evaluation

B. Follow-up every 3 months for 2 years then every 6 months for 2 years and then annually if there is known spine disease

C. New or worsening of symptoms

D. Evaluation after completion of chemotherapy or radiation therapy
A. Scoliosis
B. Peripheral neurofibromas (2 or more)
C. Hearing loss
D. Brain tumor
E. Spinal cord tumor
F. New onset of [One of the following]
   1. Sensory loss
   2. Motor deficit
   3. Incoordination
   4. Bladder or bowel dysfunction

XI. **Chiari Malformation**
A. For Chiari malformation, MRI head contrast (CPT® 70551) is appropriate
B. Once Chiari malformation has been identified, there may be a need to:
   1. Exclude syrinx
      a. MRI cervical spine without and with contrast (CPT® 72156) and MRI thoracic spine without and with contrast (CPT® 72157)
   2. Follow-up hydro/syringomyelia
      a. MRI spine studies without and with contrast (is superior to spine CT)
      b. Annual imaging until non-progression of the syringomyelia is established
      c. Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established
      d. Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration
      e. Head or neck MRA and CTA are not needed in the evaluation of syringomyelia unless ordered by the operating surgeon for preoperative planning.
   3. Evaluate for hydrocephalus with CSF flow studies. There is no unique CPT® code to report a CSF flow study; it is performed as a sequence during a MRI head without contrast (CPT® 70551). No separate code should be assigned
   4. Repeat MRI head without contrast (CPT® 70551) is not needed unless there are increasing symptoms or signs, or it is to be used as a preoperative study
   5. Perform an MRI lumbar spine if there is concern for other associated congenital abnormalities such as tethered cord
C. Chiari malformation is not itself familial and family screening of asymptomatic individuals is not appropriate

XII. **Inflammatory Spondylitis**
A. Initial plain x-rays are equivocal or not diagnostic, MRI without and with contrast or MRI without contrast or CT without contrast if MRI is contraindicated
References:


72149, 72158 MRI Lumbar Spine
I. Dural arteriovenous fistula (DAVF) suspected on MRI\textsuperscript{1-3}  
A. Must have copy of MRI report indicating the above  

II. Spinal arteriovenous malformation (AVM)\textsuperscript{3,4} [One of the following]  
A. Suspected on recent MRI, must have copy of report  
B. Follow up after treatment  

References:  
72191 CTA of the Pelvis

Note: For evaluation of PVD, the appropriate CPT code is 75635 (CTA abdominal aorta with runoff) rather than either CTA abdomen or CTA pelvis.

I. Suspected occlusion or stenosis of iliac or femoral arteries 1-6 (CTA of the abdominal aorta with runoff, 75635)

II. Abdominal Aortic aneurysm (AAA) 27,28,30
   A. For non-obese patients, ultrasound (CPT® 76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass
   B. For obese patients, CT abdomen and Pelvis with contrast (CPT® 74177) can be substituted for US using the same timeline as non-obese patient
   C. One-time screening recommendations for AAA (Ultrasound (CPT® 76775):
      1. Men age 65 to 75 who have smoked
      2. Women and non-smokers – no routine screening
      3. Medicare covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
         a. Family history of AAA
         b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime
   D. Surveillance recommendations for AAA (Ultrasound (CPT® 76775):
      1. 2.6-2.9cm → once at 5 years
      2. 3.0-3.4cm → once at 3 years
      3. 3.5-4.4cm → annually
      4. 4.5-5.4 cm → every 6 months
   E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or at least 1 cm in a year may undergo more frequent monitoring and should be evaluated by a Vascular Specialist
   F. Preoperative imaging if endovascular or open repair of AAA is being considered (CPT® 74177, 74178, 74175 or 72191
   G. New onset of back and/or abdominal pain in a patient with a known AAA (CPT® 74177, 74178, 74175 or 72191)
   H. Post Open Aortic Repair:
      1. Every 3 years to screen for aneurysms in the remaining aorta
   I. Post Endovascular (Stent) Aortic Repair:
      1. 1 month
      2. 3 months if there was evidence of endoleak on the 1 month study
      3. 6 months
      4. 12 months
      5. Every year
III. **Suspected pelvic AVM**\(^{1,14}\) [One of the following]
   
   A. Pulsatile pelvic mass
   
   B. Incidental finding on prior imaging including ultrasound

IV. **Pelvic trauma with suspected vascular injury**

V. **Pelvic Pain/Dyspareunia**\(^{29-34}\)
   
   A. If the initial ultrasound is equivocal for unexplained chronic pelvic pain and if pelvic congestion is suspected:
      1. MRI Pelvis (CPT® 72195) and/or pelvis MRV (CPT® 72198), and/or CTV pelvis (CPT® 72191) for pelvic congestion.
   
   B. If pelvic AVM is suspected, and if one of the following is present, then CTA pelvis (CPT® 72191) can be considered:
      1. Pulsatile pelvic mass
      2. Incidental finding on prior imaging including ultrasound

VI. **Evaluation of renal transplant for suspected renal artery stenosis** [Both of the following]
   
   A. New onset of hypertension
   
   B. Rising renal function tests

VII. **Intestinal angina or chronic mesenteric ischemia**\(^{1,2,15-21}\) (CTA of the abdomen and pelvis, CPT® 74174)

VIII. **Ischemic colitis**\(^{20,21}\) (CTA of the abdomen and pelvis, CPT® 74174)

IX. **Evaluation of pelvic veins**\(^{1}\) [One of the following]
   
   A. Suspicion of iliac vein thrombus
      1. Indeterminate duplex venous ultrasound which includes evaluation of phasic respiratory signals and swelling of the entire leg
   
   B. Suspicion of inferior vena cava thrombus
      1. Bilateral leg swelling
   
   C. May-Thurner syndrome
      1. Swelling and pain of the left leg not explained by venous ultrasound including duplex venous ultrasound
   
   D. Tumor invasion

X. **Arteriovenous fistula with “high output” heart failure**\(^{25-26}\)
   
   A. CT Chest with contrast (CPT® 71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) OR
   
   B. CTA Chest (CPT® 71275) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) OR
   
   C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) OR
   
   D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)
XI. Thoracic Aorta

NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians' preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

<table>
<thead>
<tr>
<th>Table of Thoracic Aorta Imaging Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT® 71275, CPT® 74175, CPT® 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT® 71555, CPT® 74185, CPT® 72198)</td>
</tr>
</tbody>
</table>

A. Aortic Dissection
1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
   a. “Medically” treated
      i. Every 6 months if total aortic diameter is >4.5 cm
      ii. Annually if total aortic diameter is <4.5 cm
   b. Surgery or Stent for any type of dissection
      i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. >/=4.5 TAA can be followed every 6 months
      iii. >/= 3.0 cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Susicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
      i. First year: 1 month, 3 months, 6 months, 12 months, then annually
4. Screening with abdominal aortic Aneurysm (AAA)
a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)
b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes
1. Screening for Familial Syndromes and Genetic Syndromes
   a. **Suspicious** Familial Thoracic Aortic Aneurysm
      i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection
   b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately
   c. **Follow-Up** per TAA Follow-Up guidelines
2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
   a. **Suspicious**, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
   b. Follow-up
      i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve
1. Screening for Bicuspid Aortic Valve
   a. **Suspicious**, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
      i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
      ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.
   b. **Follow-up** per TAA Follow-Up guidelines
      i. If no dilation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

XII. **Peripheral arterial vascular disease**\(^{1,6}\) (CTA of the abdominal aorta with runoff, CPT® 75635)

XIII. **Iliac Artery Aneurysm (IAA)**\(^{29,30}\)
A. Evaluation of a suspected IAA should begin with ultrasound
B. If ultrasound is equivocal, CT pelvis with contrast (CPT® 72193) may be performed
C. Follow-up imaging studies can be performed annually
D. Preoperative imaging if endovascular or open repair is being considered (CPT® 74177, 74178, or 74174)
E. Post endovascular iliac repair (stent): (CPT® 72191, 72193, 72194, or 72198)
   1. 1 week
   2. 1 month
   3. 3 months
4. 6 months
5. Every 6 months thereafter

XIV. Leiomyomata/Uterine Fibroids

A. MRI pelvis without and with contrast (CPT® 72197), or without contrast (CPT® 72195) can be used in the evaluation of leiomyomas for the following:
   1. Guide the treatment of myomas in an enlarged uterus with multiple myomas and/or precise myoma mapping is of clinical importance (for surgical planning)
   2. Equivocal sonohysterography or panoramic hysteroscopy with suspected submucous leiomyoma and imaging is needed for surgical planning
   3. Indeterminate US prior to myomectomy
   4. Leiomyoma necrosis is suspected
   5. Arterial embolization is being considered
      a. If MRI is indeterminate, MRA pelvis (CPT® 72198) or CTA pelvis (CPT® 72191) can be considered if requested by the interventional radiologist planning the arterial embolization
      b. Post-embolization
         i. There is no evidence to support CTA or MRA after embolization unless persistent or recurrent symptoms

XV. Impotence/Erectile Dysfunction

A. If large vessel vascular insufficiency is suspected following ultrasound, then CTA Pelvis (CPT® 72191) with contrast may be indicated.

Note: For evaluation of PVD, unlike with MRA studies, the appropriate CPT® code is 75635 (CTA abdominal aorta with runoff) rather than either CTA abdomen and/or CTA pelvis.

References:


Note: For radiation therapy planning, use CPT® 77014. For CyberKnife® planning, use CPT® 77014. For CT guided needle placement, biopsy or drainage, use CPT® 77012. For CT guided tissue ablation, use CPT® 77013.

I. Complaints associated with abdominal pain\textsuperscript{1-11} [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

II. Pelvic Pain/Dyspareunia\textsuperscript{119-124}
   A. Chronic pelvic pain and pelvic ultrasound is equivocal
   B. If initial ultrasound is normal, consider urological work-up, gastroenterology work-up or laparoscopic evaluation(s) in evaluation of pelvic pain.
   C. Work-up of interstitial cystitis/bladder pain syndrome (IC/BPS) should include history, physical exam, laboratory exam (urinalysis and urine culture), and measurement of post void residual urine by bladder catheterization or by ultrasound (CPT® 76856 or CPT® 76857 or CPT® 76830 [female]). CT pelvis with contrast (CPT® 72193) and/or CT abdomen and pelvis with contrast (CPT® 74177) may be indicated if ultrasound is equivocal for complicated interstitial cystitis/bladder pain syndrome (when ordered by Specialist) or uncomplicated when ultrasound is equivocal or abnormal.

III. Evaluation of symptoms after any abdominopelvic surgery\textsuperscript{1} [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178, unless this is a follow up for a known complication that is localized to the pelvis]

IV. Abdominal Aortic Aneurysm (AAA)\textsuperscript{120-122}
   A. For non-obese patients, ultrasound (CPT® 76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass
   B. For obese patients, CT abdomen with contrast (CPT® 74160) can be substituted for US using the same timeline as non-obese patient
   C. One-time screening recommendations for AAA (Ultrasound (CPT® 76775)
      1. Men age 65 to 75 who have smoked
      2. Women and non-smokers – no routine screening
      3. Medicare covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
         a. Family history of AAA
         b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime
D. Surveillance recommendations for AAA (Ultrasound (CPT® 76775):
   1. 2.6-2.9 cm → once at 5 years
   2. 3.0-3.4 cm → once at 3 years
   3. 3.5-4.4 cm → annually
   4. 4.5-5.4 cm → every 6 months
E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or
   at least 1 cm in a year may undergo more frequent monitoring and should be
   evaluated by a Vascular Specialist
F. Preoperative imaging if endovascular or open repair of AAA is being
   considered (CPT® 74177, CPT® 74178, CPT® 74175 or CPT® 72191
G. New onset of back and/or abdominal pain in a patient with a known AAA
   (CPT® 74177, CPT® 74178, CPT® 74175 or CPT® 72191)
H. Post Open Aortic Repair: (CPT® 72193 or CPT® 72194)
   1. Every 3 years to screen for aneurysms in the remaining aorta
I. Post Endovascular (Stent) Aortic Repair: (CPT® 72193 or CPT® 72194)
   1. 1 month
   2. 3 months if there was evidence of endoleak on the 1 month study
   3. 6 months
   4. 12 months
   5. Every year

V. Obstruction of bowel21-23 [See CT of the abdomen and pelvis,
   CPT® 74176, CPT® 74177, or CPT® 74178]

VI. Diverticulitis, suspected or known in a patient with lower
   abdominal pain and/or mass4,5 [See CT of the abdomen and
   pelvis, CPT® 74176, CPT® 74177, or CPT® 74178 except for follow
   up of known diverticulitis]

VII. Appendicitis6,7 (In children and pregnant women, ultrasound as
   the initial study except for follow-up of known appendicitis with
   suspected complications. If this is not possible then see CT of
   the abdomen and pelvis [CPT® 74176, CPT® 74177, or CPT®
   74178]. MRI abdomen [CPT® 74181, CPT® 74182, or CPT® 74183]
   in pregnant women.)

VIII. Suspected pelvic abscess, pelvic inflammatory disease (PID)118-119
   A. Pelvic (CPT® 76856 or CPT® 76857) and/or TV (CPT® 76830) US is the initial
      study for imaging of pelvic inflammatory disease (PID)
   B. CT abdomen and pelvis with contrast (CPT® 74177) or CT pelvis with contrast
      (CPT® 72193) when:
      1. US is indeterminate, or
      2. Extensive abscess formation as determined by ultrasound
IX. Follow-up of known pelvic abscess or fistula during or after treatment [One of the following]
   A. Follow up evaluation at completion of treatment
   B. Evaluation prior to removal of drain

X. Hematuria\textsuperscript{3,64-66} [See CT of the abdomen and pelvis, CPT\textsuperscript{©} 74176, CPT\textsuperscript{©} 74177, or CPT\textsuperscript{©} 74178]

XI. Complex ovarian, adnexal or other pelvic mass found on imaging or physical examination\textsuperscript{67, 101, 112-117}
   A. If an ultrasound does not identify the origin of the pelvic mass (adnexal, uterine, or other in etiology), MRI pelvis (CPT\textsuperscript{©} 72197 or CPT\textsuperscript{©} 72195 if pregnant) may be considered for preoperative planning if requested by the operating surgeon. CT can be used if the mass is unrelated to female pelvic anatomy or if MRI is contraindicated. Send to MD review.
   B. CT may be considered for elevated tumor makers if an ultrasound is indeterminate and/or ovarian malignancy is suspected. [CPT\textsuperscript{©} 74177]
      1. CT abdomen and pelvis with contrast (CPT\textsuperscript{©} 74177) as a pre-operative study to evaluate for metastatic disease when cancer is known or suspected.
      2. CT abdomen and pelvis (CPT\textsuperscript{©} 74177) can detect omental metastases, peritoneal implants, pelvic and periaortic lymph node enlargement.
      3. CT abdomen and pelvis without and with contrast (CPT\textsuperscript{©} 74178) can be considered for suspected hepatic metastases and obstructive uropathy.
      4. Advanced imaging may be indicated for an ovarian mass suspicious for metastatic disease (e.g. from breast, uterine, colorectal or gastric cancer) and should be evaluated based on the appropriate Oncology Imaging guideline.

XII. Urethral diverticulum and ultrasound fails to demonstrate a diverticulum\textsuperscript{68-69} [One of the following]
   A. Incontinence
   B. Urinary frequency, urgency, burning on urination, dysuria
   C. Dribbling, dyspareunia

XIII. Suspected sacral or pubic fracture\textsuperscript{73-76} (MRI) [One of the following]
   A. Stress or insufficiency fracture suspected and negative or non diagnostic x-ray 10-14 days after injury
   B. Stress or insufficiency fracture suspected and normal x-ray but bone scan non-specific and positive
   C. Stress or insufficiency fracture suspected and elderly individual with normal x-ray and bone scan positive
   D. Stress or insufficiency fracture suspected and normal x-ray and bone scan in last 48 hours with documented osteoporosis or long term steroid use
   E. Trauma with negative or non diagnostic x-rays
   F. Post radiation therapy to the pelvis with sacral or pubic pain
XIV. Fever of unknown origin (FUO)\(^{77}\) [See CT of the abdomen and pelvis, CPT\(^{®}\) 74176, CPT\(^{®}\) 74177, or CPT\(^{®}\) 74178]

XV. Abdominal or Pelvic Trauma

Ultrasound (CPT\(^{®}\) 76700 and/or CPT\(^{®}\) 76856) should be used initially for trauma with low probability of intra-abdominal injury (minimal pain, no evidence of peritoneal irritation on physical examination, no hemodynamic instability, no elevated AST/ALT). [One of the following]

A. In patients with BMI > 35, ultrasound imaging may be suboptimal and CT Abdomen and Pelvis with contrast may be performed.

B. To determine whether individuals need hospitalization for observation as a result of blunt renal trauma with hematuria, CT Abdomen and Pelvis without and with contrast (CPT\(^{®}\) 74178) should be used initially.

C. CT Abdomen and/or Pelvis with contrast (CPT\(^{®}\) 74160, or CPT\(^{®}\) 72193, or CPT\(^{®}\) 74177):
   1. High probability intra-abdominal injury
   2. Seat belt sign
   3. Rebound tenderness or guarding
   4. Hypotension
   5. Abdominal distension
   6. Concomitant femur fracture (may indicate blunt abdominal trauma in patients struck by automobiles)

D. If ultrasound demonstrates any positive finding(s)

XVI. Cryptorchidism (undescended testicle)\(^{81-83}\) (MRI unless contraindicated. The correct procedure is MRI of the abdomen and pelvis. If CT must be used because the MRI is contraindicated it should be of the abdomen and pelvis.)

XVII. Crohn’s disease and inflammatory bowel disease\(^{8,9,84,85}\) [See CT of the abdomen and pelvis, CPT\(^{®}\) 74176, CPT\(^{®}\) 74177, or CPT\(^{®}\) 74178]

XVIII. CT enterography\(^{8,9,84,85}\) [See CT of the abdomen and pelvis, CPT\(^{®}\) 74176, CPT\(^{®}\) 74177, or CPT\(^{®}\) 74178]

XIX. Thoracic Aorta\(^{126-136}\)

NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians’ preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:
Table of Thoracic Aorta Imaging Options

| CT of chest, and/or abdomen, and/or pelvis (contrast as requested); |
| MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast |
| CTA of chest, and/or abdomen, and/or pelvis (CPT® 71275, CPT® 74175, CPT® 72191); |
| MRA of chest, and/or abdomen, and/or pelvis (CPT® 71555, CPT® 74185, CPT® 72198) |

A. Aortic Dissection
1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
   a. “Medically” treated
      i. Every 6 months if total aortic diameter is >4.5 cm
      ii. Annually if total aortic diameter is <4.5 cm
   b. Surgery or Stent for any type of dissection
      i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. >/=4.5 TAA can be followed every 6 months
      iii. >/= 3.0 cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Suspicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
      i. First year: 1 month, 3 months, 6 months, 12 months, then annually
4. Screening with abdominal aortic Aneurysm (AAA)
   a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)
   b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes
1. Screening for Familial Syndromes and Genetic Syndromes
a. **Suspected** Familial Thoracic Aortic Aneurysm
   i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection
b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately
c. **Follow-Up** per TAA Follow-Up guidelines

2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
   a. **Suspected**, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
   b. **Follow-up**
      i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follw-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve
   1. Screening for Bicuspid Aortic Valve
      a. **Suspected**, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
         i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
         ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.
      b. **Follow-up** per TAA Follow-Up guidelines
         i. If no dilation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

XX. **Weight loss**[^90] [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXI. Kidney or renal stones[^3] [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXII. Abdominal distention on physical examination [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXIII. Soft tissue mass of the abdominal wall[^91,124-127] (CPT® 72192 or CPT® 72193) Unilateral leg edema[^92] [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXIV. Head and Neck Cancers [See CT of the abdomen CPT® 74150, CPT® 74160 or CPT® 74170 and CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]
XXV. Non-small cell Lung Cancer cancer [Usually CT of the abdomen CPT® 74150, CPT® 74160 or CPT® 74170. Also see CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXVI. Small cell Lung Cancer [Usually CT of the abdomen CPT® 74150, CPT® 74160 or CPT® 74170. Also see CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXVII. Extrathoracic Small Cell Carcinoma (High grade Neuroendocrine carcinoma) [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXVIII. Esophageal cancer51 [Usually CT of the abdomen CPT® 74150, CPT® 74160 or CPT® 74170 and CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXIX. Gastric cancer52 [Usually CT of the abdomen CPT® 74150, CPT® 74160 or CPT® 74170. Also see CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXX. Pancreatic cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXI. Colon cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXII. Rectal cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXIII. Anal cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXIV. Soft tissue sarcoma [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXV. Melanoma [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXVI. Breast cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXVII. Renal cell carcinoma or kidney cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178 and CT of the abdomen CPT® 74150, CPT® 74160 or CPT® 74170]
XXXVIII. Transitional cell cancer (muscle invasive and non-invasive cancer) arising from the bladder, ureters, prostate, urethra and renal pelvis [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XXXIX. Prostate cancer

A. **CT Pelvis with contrast (CPT® 72193)** or MRI Pelvis without and with contrast (CPT® 72197) be obtained for one of the following:
   1. Initial staging of newly diagnosed Prostate cancer only for one of the following:
      a. Gleason score ≥ 7
      b. PSA >20
      c. Gleason score of 6 with one of the following:
         i. Tumor involving >50% of one lobe (T2b)
         ii. Tumor involving both lobes (T2c)
         iii. PSA >10

B. **CT Abdomen and Pelvis with contrast (CPT® 74177)** may be obtained for one of the following:
   1. Initial staging of newly diagnosed prostate cancer (in addition to either CT or MRI of the pelvis) for one of the following:
      a. PSA >20
      b. Elevated creatinine for age
      c. Hematuria not related to prostate biopsy
      d. Lymphadenopathy or extraprostatic disease noted on pelvic imaging
   2. Restaging for suspected recurrence/progression
      a. Patient on hormonal therapy and having 2 consecutive rise in PSA levels
      b. Patients treated with radical prostatectomy and one of the following:
         i. Palpable anastomotic recurrence
         ii. PSA remains >0.2 after at least 2 PSA checks
         iii. Initially undetectable PSA rises on 2 consecutive measurements
      c. Patients treated with radiation therapy and one of the following:
         i. Clinical concern for progression based on exam findings
         ii. PSA rises on 2 consecutive measurements above the post-radiation therapy baseline
      d. Clinical suspicion for relapse based on physical exam findings or PSA
      e. Hormone-refractory prostate cancer on treatment
         i. Treatment with chemotherapy – every 2 cycles (6 to 8 weeks)
         ii. Treatment with anti-androgen therapy – every 3 months
      f. Prior to starting Xofigo (Radium-223) therapy
         i. Surveillance – CT or MRI scan is not used routinely to monitor patients who are being followed on Active Surveillance protocol or those that have received treatment and are being monitored off therapy.
XL. Testicular cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XLII. Ovarian cancer, fallopian tube cancer, and primary peritoneal cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]
A. Cervical cancer [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XLII. Uterine cancer
A. CT Pelvis with contrast (CPT® 72193) or MRI Pelvis without and with contrast (CPT® 72197) be obtained for one of the following:
   1. Initial staging of newly diagnosed uterine cancer and one of the following:
      a. Extraterine disease suspected
      b. Grade III tumor
B. For all other indications, see [See CT of the abdomen and pelvis CPT® 74176, CPT® 74177, or CPT® 74178]

XLIII. Squamous cell cancer of the external genitalia (vulva, vagina and penis) [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178] Hodgkin’s lymphoma [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

XLIV. Non-Hodgkin’s lymphoma (follicular lymphoma, marginal zone lymphoma, MALT lymphoma, mantle cell lymphoma, diffuse large B-cell lymphoma, Burkitt’s lymphoma, peripheral T-cell lymphoma, mycosis fungoides, hairy cell leukemia, post-transplant lymphoproliferative disorders, CLL/SLL) [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178] Primary or metastatic bone tumor of the pelvis–known or suspected 97-99 An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
A. X-ray results or CT results and suspected (not known) bone tumor [one of the following]
   1. Negative or does not explain the regional symptoms (MRI without contrast)
   2. Suspicious for osteoid osteoma clinically or radiographically (CT)
   3. Indeterminate for malignancy (MRI without and with contrast)
   4. Aggressive appearance on x-ray (MRI without and with contrast)
   5. Pathologic fracture; not definitely benign (MRI without and with contrast)
   6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
B. Osteosarcoma of the pelvis [One of the following] (MRI is preferred)
1. Initial staging of primary site
2. Restaging after completion of neoadjuvant chemotherapy prior to surgery
3. Restaging after completion of treatment
4. Surveillance after completion of all treatment – every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years after completion of all therapy

C. **Ewing's sarcoma of the pelvis** [One of the following] (MRI is preferred)
   1. Initial staging of primary site
   2. Restaging after completion of neoadjuvant chemotherapy prior to surgery
   3. Restaging after completion of treatment
   4. Surveillance after completion of all treatment – every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years after completion of all therapy

D. **Chondrosarcoma of the pelvis** [One of the following] (MRI is preferred)
   1. Initial staging of primary site
   2. Restaging after completion of treatment
   3. Monitoring response to chemotherapy – every 2 cycles (6 to 8 weeks)
   4. Restaging after completion of all treatment to establish post-treatment baseline
   5. Surveillance – CT or MRI is not routinely indicated for surveillance. Plain x-rays of primary site may be obtained, MRI (preferred) may be obtained for any new findings on x-ray or for new/worsening clinical symptoms

E. **Chordoma of the pelvis** [One of the following] (MRI is preferred)
   1. Initial staging of primary site
   2. Monitoring response to chemotherapy – every 2 cycles (6 to 8 weeks)
   3. Restaging after completion of all treatment to establish post-treatment baseline
   4. Surveillance – CT or MRI is not routinely indicated for surveillance. Plain x-rays of primary site may be obtained, MRI (preferred) may be obtained for any new findings on x-ray or for new/worsening clinical symptoms

F. **Giant cell tumor of the bone in the pelvis** [One of the following]
   1. Initial staging of primary site
   2. Monitoring response to chemotherapy – every 2 cycles (6 to 8 weeks)
   3. Restaging after completion of all treatment to establish post-treatment baseline
   4. Surveillance – CT or MRI is not routinely indicated for surveillance. Plain x-rays of primary site may be obtained, MRI (preferred) may be obtained for any new findings on x-ray or for new/worsening clinical symptoms

G. **Known primary malignancy other than bone** [One of the following]
   1. Known malignancy with pelvic bone pain, after X-rays and bone scan have been performed
   2. Positive bone scan in the pelvis with no pain
3. Known malignancy with prior pelvic involvement
4. Known malignancy with new signs or symptoms related to the pelvis

XLV. Metastatic Cancer from an Unknown Primary site [See CT of the abdomen and pelvis, CPT® 74176, CPT® 74177, or CPT® 74178]

Evaluation of congenital anomalies of the pelvis (if MRI is contraindicated)\textsuperscript{115-118}

\begin{itemize}
\item A. Pelvic ultrasound (CPT® 76856 or CPT® 76857) and/or TV ultrasound (CPT® 76830) is the initial imaging modality for the detection of uterine anomalies. 3-D Rendering (CPT® 76376/CPT® 76377) may be approved as an add-on.
\item B. Retroperitoneal ultrasound (CPT® 76770 or CPT® 76775) is indicated to evaluate for coexisting renal anomalies
\item C. Pelvis MRI without and with contrast (CPT® 72197).
\begin{itemize}
\item 1. Ultrasound defines a complex anomaly or is not definitive, or if requested for surgical planning.
\end{itemize}
\end{itemize}

XLVI. Evaluation of known complex pelvic fractures for treatment planning [One of the following]

\begin{itemize}
\item A. Pelvic fracture demonstrated on x-ray or MRI
\item B. Non-diagnostic x-ray or MRI with suspicion of pelvic fracture
\end{itemize}

XLVII. Evaluation of complex fractures of the acetabulum [One of the following]

\begin{itemize}
\item A. Known fracture on recent x-ray or MRI
\item B. Non-diagnostic x-ray or MRI with strong suspicion of acetabular fracture
\end{itemize}

XLVIII. Inguinal or Femoral Hernia\textsuperscript{100,101}

\begin{itemize}
\item A. Ultrasound is the initial imaging for known or suspected primary or recurrent inguinal or femoral hernia
\item B. CT pelvis with contrast (CPT® 72193) or without contrast (CPT® 72192) if there is suspected incarceration or strangulation of inguinal or femoral hernia.
\item C. Chronic post-surgical groin pain (after hernia repair) if Pelvic ultrasound or US-guided nerve block are indeterminate or non-diagnostic, to assess for non-neuropathic causes.
\end{itemize}

XLIX. Arteriovenous fistula with “high output” heart failure:\textsuperscript{102-103}

\begin{itemize}
\item A. CT Chest with contrast (CPT® 71260 ) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) \textbf{OR}
\item B. CTA Chest (CPT® 71275 ) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) \textbf{OR}
\item C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) \textbf{OR}
\item D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)
\end{itemize}

L. Spigelian, Ventral, Umbilical, or Incisional Hernia\textsuperscript{104-110} [CPT® 72192 or CPT® 72193]
A. Known or suspected primary or recurrent Spigelian hernia (anterior abdominal wall hernia through the semilunar line), ventral hernia, umbilical, or incisional hernia

LI. **Lumbar and Lumbosacral Plexus**

A. MRI Pelvis without and with contrast with fat suppression imaging (CPT® 72197) OR MRI Abdomen and Pelvis without and with contrast with fat suppression imaging (CPT® 74183 and CPT® 72197) OR if MRI is not available, CT Pelvis with contrast (CPT® 72193) OR CT Abdomen and Pelvis with contrast (CPT® 74177) can be considered after EMG/NCV based on whether the upper lumbar plexus (abdominal retroperitoneal space) or the lumbosacral plexus (pelvis), respectively, is involved based on:
   1. Malignant infiltration (EMG not required)
   2. Radiation plexopathy to r/o malignant infiltration
   3. Traumatic injury

LII. **Iliac Artery Aneurysm (IAA)**

A. Evaluation of a suspected IAA should begin with ultrasound
B. If ultrasound is equivocal, CT pelvis with contrast (CPT® 72193) may be performed
C. Follow-up imaging studies can be performed annually
D. Preoperative imaging if endovascular or open repair is being considered (CPT® 74177, CPT® 74178, or CPT® 74174)
E. Post endovascular iliac repair (stent): (CPT® 72191, CPT® 72193, CPT® 72194, or CPT® 72198)
   1. 1 week
   2. 1 month
   3. 3 months
   4. 6 months
   5. Every 6 months thereafter

LIII. **Intra-Abdominal Mass detected by other means** [CPT® 72192 or CPT® 72193] (One of the following)

A. Mass is seen on prior imaging
B. Physical exam suggests a palpable mass

LIV. **Proctalgia Syndromes**

A. The proctalgia syndromes are characterized by recurrent episodes of rectal/perineal pain, and may be due to sustained contractions of the pelvic floor musculature. Prior to advanced imaging, the evaluation of rectal/perineal pain should include:
   1. Digital rectal examination (assess for mass, prostate, fissures, hemorrhoids, etc.)
   2. Pelvic examination in females to exclude PID
   3. Recent flexible sigmoidoscopy or colonoscopy subsequent to the start of reported symptoms to exclude inflammatory conditions or malignancy
4. Endoanal US, MRI Pelvis, or CT Pelvis are appropriate after the above studies have been performed or if laboratory or clinical data suggest infection, abscess, or inflammation

References:
15. Fattori R, Russo V. Degenerative aneurysm of the descending aorta. Endovascular Treatment, European Association for Cardio-thoracic Surgery, Multimedia Manual of Cardiothoracic Su
32. Cooper J. Pelvic ring injuries, Trauma, 2006; 8:95-100.


49. Daniels CJ, Scali F. Clinical brief: recognition and treatment of the elusive sports hernia. Topics in Integrative Health Care, 2012; 3(3).


72192, 72193, 72194 CT of the Pelvis
I. Mass detected by other means

A. If ultrasound does not identify the origin of the pelvic mass (adnexal, uterine, or other in etiology) MRI pelvis is indicated
   1. If the mass is unrelated to female pelvic anatomy, CT is indicated.

B. CT or MRI may be considered for a complex mass if an ultrasound is indeterminate and/or ovarian malignancy is suspected.
   1. If an ultrasound is indeterminate and malignancy is suspected, CT pelvis or MRI pelvis (CPT® 72197 or CPT® 72195 if pregnant) may be considered for preoperative planning if requested by the operating surgeon. Send to MD review.
   2. If an ultrasound is indeterminate and ovarian malignancy is suspected, CT pelvis with contrast (CPT® 72193) or MRI pelvis (CPT® 72197 or CPT® 72195 if pregnant) may be considered for elevated tumor markers:
      a. Germ cell tumors are more common in young women which can be confirmed by beta hCG, AFP, and LDH
      b. CA 125 tumor marker can confirm for other malignancy suspicion
   3. CT abdomen and pelvis with contrast (CPT® 74177) as a pre-operative study to evaluate for metastatic disease when cancer is known or suspected.
   4. CT abdomen and pelvis (CPT® 74177) can detect omental metastases, peritoneal implants, pelvic and periaortic lymph node enlargement.
   5. CT abdomen and pelvis without and with contrast (CPT® 74178) can be considered for suspected hepatic metastases and obstructive uropathy.
   6. Advanced imaging may be indicated for an ovarian mass suspicious for metastatic disease (e.g. from breast, uterine, colorectal or gastric cancer) and should be evaluated based on the appropriate Oncology Imaging guideline.

II. Pelvic pain/Dyspareunia

A. If the initial ultrasound is equivocal for unexplained chronic pelvic pain and if pelvic congestion is suspected:
   1. MRI Pelvis (CPT® 72195) and/or pelvis MRV (CPT® 72198), and/or CTV pelvis (CPT® 72191) for pelvic congestion.

III. Adenomyosis if ultrasound (including transvaginal sonography is not diagnostic [One of the following]

A. Patient has failed at least 3 months of hormonal suppression or
B. Enlarged uterus or with coexisting fibroids and further delineation would affect management
IV. **Endometriosis**\(^{139}\) suspected and negative or normal ultrasound including transvaginal ultrasound  
A. Findings [One of the following]  
1. Fixed retroverted uterus  
2. Tender utero-sacral ligaments or nodularity  
3. Enlarged ovaries  
B. Laparoscopy nondiagnostic for endometriosis or contraindicated

V. **Suspected congenital anal, vaginal or uterine anomaly**\(^{128-131}\) (septate, bicornate, didelphic)  
A. Pelvic ultrasound (CPT® 76856 or CPT® 76857) and/or TV ultrasound (CPT® 76830) is the initial imaging modality for the detection of uterine anomalies  
B. 3-D Rendering (CPT® 76376/CPT® 76377) may be approved as an add-on.  
C. Retroperitoneal ultrasound (CPT® 76770 or CPT® 76775) is indicated to evaluate for coexisting renal anomalies  
D. If a pelvic ultrasound and/or transvaginal ultrasound defines a complex anomaly or is not definitive, or if requested for surgical planning

VI. **Known or suspected tumor including lymphoma**\(^{16-50}\) (CT) [One of the following]  
A. Initial staging [One of the following]  
1. Lymphoma including primary CNS lymphoma, Hodgkin's disease and non-Hodgkin's lymphoma (A separate diagnostic CT is not medically necessary if it was done as part of the PET/CT)  
2. Bladder cancer [One of the following] (MRI)  
   a. High grade or sessile tumor prior to TURBT  
   b. Muscle invasion  
3. Rectal cancer  
4. Anal cancer  
5. Colon cancer  
6. Cervical cancer (MRI)  
   a. Initial staging for clinical stage IB2 or higher  
7. Breast cancer (This may be done in addition to PET/CT when that study is indicated)  
   a. Clinical stage I–IIIB [One of the following]  
      i. Alkaline phosphatase >140 U/L and/or  
      ii. Total bilirubin >1 mg/L and/or  
      iii. GGT > 42 IU/L and/or  
      iv. AST >40 IU/L and/or  
      v. Palpable abdominal mass  
      vi. Abdominal pain  
8. Prostate cancer (See XIII below)  
9. Carcinoid  
10. Kidney or renal cell cancer  
11. Esophageal cancer  
12. Gastric cancer
13. Soft tissue sarcoma involving the retroperitoneum, pelvis or abdomen
14. Endometrial cancer (MRI)
15. Uterine sarcoma
16. Bone tumor arising in the pelvis
17. Transitional cell carcinoma of the ureter
18. Ovarian cancer
19. Testicular cancer both seminoma and non seminoma

B. New or worsening clinical data reported (CT of the abdomen and pelvis) [One of the following]
1. Anorexia
2. Weight loss
3. Abdominal or pelvic pain
4. Abdominal or pelvic mass
5. Hepatomegaly
6. Ascites
7. Bowel obstruction by KUB
8. Pelvic or lower extremity pain
9. Leg weakness or numbness
10. Hematuria
11. Rectal bleeding
12. Vaginal bleeding
13. New or worsening hydronephrosis
14. New onset of renal insufficiency [One of the following]
   a. New onset of BUN > 20 mg/dL
   b. New onset of creatinine > 1.5mg/dL
15. Lab values elevated/increasing [One of the following]
   a. Elevated CEA (>2.5 in non smoker and >5.0 in smoker) on two consecutive tests
   b. Rising bilirubin (total bilirubin >1.9mg/dL)
   c. Alkaline phosphatase >120 IU/L
   d. Rising CA 19-9 (pancreatic cancer) >120 IU/ml
   e. Rising CA125 >35 U/ml
   f. Rising PSA on 2 consecutive tests >4 ng/ml

VII. **Arterial Embolization is being considered**

   A. Patients selected for uterine artery embolization (UAE) may be approved for preoperative MRI to allow planning of the procedure
   B. If MRI is indeterminate, MRA pelvis (CPT®72198) or CTA pelvis 72191 can be considered if requested by the interventional radiologist planning the arterial embolization.
   C. There is no evidence to support interval MRI after embolization unless persistent or recurrent symptoms

VIII. **Evaluation before or after uterine myomectomy**

   A. Preoperatively if there is:
1. Guide the treatment of myomas in an enlarged uterus with multiple myomas and/or precise myoma mapping is of clinical importance (for complex surgical planning)
2. Equivocal sonohysterography or panoramic hysteroscopy with suspected submucous leiomyoma and imaging is needed for surgical planning
3. Indeterminate US prior to myomectomy
4. Leiomyoma necrosis is suspected

IX. **Urethral diverticulum**\(^{57-61}\) If ultrasound is indeterminate and [one of the following]
   A. Tender cystic swelling protruding from the vagina
   B. Urinary frequency, urgency, burning on urination, dysuria
   C. Dribbling
   D. Dyspareunia

X. **Suspected sacral or pubic fracture**\(^{62}\) with normal or non diagnostic x-ray [One of the following]
   A. Stress or insufficiency fracture suspected and negative or non diagnostic x-ray 10-14 days after injury
   B. Stress or insufficiency fracture suspected and normal x-ray but bone scan non-specific and positive
   C. Stress or insufficiency fracture suspected and elderly individual with normal x-ray and bone scan positive
   D. Stress or insufficiency fracture suspected and normal x-ray and bone scan in last 48 hours with documented osteoporosis or long term steroid use
   E. Trauma with negative or non diagnostic x-rays
   F. Post radiation therapy to the pelvis with sacral or pubic pain

XI. **Suspected sacroiliitis with low back pain or pain over the sacroiliac joints and no improvement after at least 4 weeks of conservative medical management with anti-inflammatory medication or muscle relaxants**\(^{63-66}\) [One of the following]
   A. Positive Patrick’s test
   B. Lower back pain radiating to ipsilateral groin

XII. **Lumbar and Lumbosacral Plexus**\(^{131}\)
   A. MRI Pelvis without and with contrast with fat suppression imaging (CPT\(^{®}\) 72197) OR MRI Abdomen and Pelvis without and with contrast with fat suppression imaging (CPT\(^{®}\) 74183 and CPT\(^{®}\) 72197) OR if MRI is not available, CT Pelvis with contrast (CPT\(^{®}\) 72193) OR CT Abdomen and Pelvis with contrast (CPT\(^{®}\) 74177) can be considered after EMG/NCV based on whether the upper lumbar plexus (abdominal retroperitoneal space) or the lumbosacral plexus (pelvis), respectively, is involved based on:
   1. Malignant infiltration (EMG not required)
   2. Radiation plexopathy to r/o malignant infiltration
3. Traumatic injury

XIII. **Prostate cancer**\(^{16,17,50}\) (This may be an endorectal MRI or may be called multiparametric MRI; if pelvic MRI is used for detection then the same study should be used for initial staging) [One of the following]

A. Detection of prostate cancer (if positive includes staging; only one pelvic MRI for detection and/or staging)
   1. Mass detected on digital rectal examination
   2. PSA > 3.5

B. Initial staging for T3 and T4 disease with biopsy proven diagnosis and no prior pelvic MRI

C. Initial staging for T1 and T2 disease if the nomogram indicates probability of lymph node involvement is more than 10% with biopsy proven diagnosis and no prior MRI

D. For planning of ultrasound biopsy using MRI/US fusion

E. Following radical prostatectomy with rising PSA on 2 or more tests

F. Immediately after radical prostatectomy with PSA detectable

G. Following radiation therapy with either PSA rise by 2 ng/mL or more above the lowest post treatment PSA or positive digital rectal examination and candidate for local therapy

H. Following treatment with androgen deprivation therapy and rising PSA

XIV. **Thoracic Aorta**\(^{126-136}\)

NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians’ preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

<table>
<thead>
<tr>
<th>Table of Thoracic Aorta Imaging Options</th>
</tr>
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<tbody>
<tr>
<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT(^{®}) 71275, CPT(^{®}) 74175, CPT(^{®}) 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT(^{®}) 71555, CPT(^{®}) 74185, CPT(^{®}) 72198)</td>
</tr>
</tbody>
</table>

A. Aortic Dissection
   1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
   2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
      a. “Medically” treated
         i. Every 6 months if total aortic diameter is \(\geq 4.5\) cm
         ii. Annually if total aortic diameter is \(< 4.5\) cm
      b. Surgery or Stent for any type of dissection
i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. >/=4.5 TAA can be followed every 6 months
      iii. >/= 3.0 cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Suspicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
      i. First year: 1 month, 3 months, 6 months, 12 months, then annually
4. Screening with abdominal aortic Aneurysm (AAA)
   a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)
   b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes
1. Screening for Familial Syndromes and Genetic Syndromes
   a. Suspected Familial Thoracic Aortic Aneurysm
      i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection
      b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately
   c. Follow-Up per TAA Follow-Up guidelines
2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
   a. Suspected, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
   b. Follow-up
      i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve
1. Screening for Bicuspid Aortic Valve
a. **Suspected**, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
   i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
   ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.

b. **Follow-up** per TAA Follow-Up guidelines
   i. If no dilation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

**XV. Evaluation of recurrent or complex anal fistula disease**

**XVI. Soft tissue mass (not a hernia) of the abdominal wall**

A. Abdominal x-ray

**XVII. MR enterography** [One of the following]

A. Bowel obstruction
B. Celiac disease
C. Complications of Crohn’s disease
   1. Abscess
   2. Fistula
   3. Small bowel obstruction
   4. Peri-anal fistula
   5. Stenosis
   6. Stricture
D. Polyposis syndromes
E. Small bowel tumor
F. Suspected Crohn’s disease [One of the following]
   1. Aural temperature >38.3°C or 100.9°F
   2. Diarrhea
   3. Weight loss
   4. Fatigue
   5. Crampy abdominal pain
   6. Perianal fistula or fissure
   7. Enterovesical fistula
   8. Enterovaginal fistula
   9. Enterocutaneous fistula
   10. Right lower quadrant tenderness
   11. Ulcerative colitis

**XVIII. Pelvic floor dysfunction and Pelvic organ prolapse**

A. If exam and ultrasound are indeterminate
B. Equivocal results on CT
C. Pre-operative planning when ordered by the operating physician
D. Dynamic MRI of abdomen (CPT® 74181 or CPT® 74183) and/or pelvis (CPT® 72195 or CPT® 72197) may be indicated for the following:
1. Pre-operative planning when ordered by the operating physician; or
2. Persistent incontinence following surgery

XIX. Breast cancer
A. Initial staging [One of the following]
   1. Clinical stage I–IIB [One of the following]
      a. Alkaline phosphatase > 140 U/L
      b. Total bilirubin > 1 mg/L
      c. GGT > 42 IU/L
      d. AST > 40 IU/L
      e. Palpable abdominal mass
      f. Abdominal pain
   2. Clinical stage IIIA or higher
B. Any evidence of breast cancer recurrence after treatment
C. Known metastatic disease [One of the following]
   1. Documented progression of disease
   2. Known metastatic disease following completion of treatment to establish new baseline

XX. Cervical cancer
A. Initial staging
B. Restaging after completion of therapy
C. When clinically indicated

XXI. Colon cancer
A. Initial staging
B. Following treatment and no known metastases annually for 3-5 years
C. Known metastases stable with no clinical change or laboratory changes such as rising tumor markers or elevated liver function tests
   1. Every 3-6 months for 2 years
   2. Every 6-12 months for up to 5 years
D. Rising CEA on 2 consecutive tests
   1. >2.5 in non smokers
   2. >5.0 in smokers
E. Rising CA 19-9 >35 U/mL

XXII. Rectal cancer
A. Initial staging
B. Following treatment with no known metastases and stable [One of the following]
   1. Every 6 months for 2 years and then annually for 3 additional years.
   2. Rising CEA (>2.5 non smokers; >5.0 smokers) if negative repeat in 3 months
C. Known non resectable metastases
1. Following chemotherapy aimed at conversion to resectable disease may be done every 2 months to evaluate resectability
D. Rising CEA on 2 consecutive tests [One of the following]
   1. >2.5 in nonsmokers
   2. >5.0 in smokers

XXIII. Ovarian cancer, fallopian tube cancer and primary peritoneal cancer\textsuperscript{37} [One of the following]
A. Initial staging
B. Following treatment and stable
C. Rising CA-125 with or without prior chemotherapy
D. Clinical relapse with or without prior chemotherapy

XXIV. Esophageal cancer\textsuperscript{48} [One of the following]
A. Initial staging
B. Prior to chemoradiation if PET/CT not done
C. Surveillance or followup stage T1bN+ or T2 or greater every 6 months for 5 years
D. Clinical recurrence

XXV. Gastric (stomach) cancer\textsuperscript{49} [One of the following]
A. Initial staging
B. Following completion of treatment
C. Clinical recurrence

XXVI. Carcinoid\textsuperscript{40} [One of the following]
A. Initial staging
B. Restaging after completion of therapy to establish a new baseline
C. Surveillance
   1. Carcinoid tumors larger than 2 cm or with incomplete resection and are stable with no evidence of disease (CT of the abdomen and pelvis)
   2. Every 3-12 months after resection every 6-12 months
   3. Every 6-12 months thereafter
D. Abnormal laboratory tests suggesting recurrence [One of the following]
   1. Elevated urine 5HIAA >15mg/24hr
   2. Elevated chromogranin A (CgA) >39ng/L
   3. Elevated substance P >270 ng/L or pg/mL

XXVII. Poorly differentiated or high grade or anaplastic small cell carcinoma other than lung\textsuperscript{40} [One of the following]
A. Initial staging
B. Restaging after completion of therapy to establish a new baseline
C. Surveillance following treatment of resectable disease
   1. Every 3 months for a year
   2. Every 6 months after 1 year
D. Surveillance following treatment of unresectable or metastatic disease
   1. Every 3 months
XXVIII. Hodgkin’s lymphoma\textsuperscript{23,25,42} (CT) [One of the following]
A. Initial staging in addition to PET/CT
B. Restaging while on treatment should be done with PET/CT
C. After treatment with radiation therapy restage with either CT or PET/CT if last PET scan was positive
D. Follow up after completion of radiation therapy treatment
E. Scan every 6-12 months for 2-5 years
F. Annual scan if there is increased risk for lung cancer (This is optional if none of the factors below are present) [One of the following]
   1. Treatment with radiation therapy
   2. Treatment with non-alkylating agent chemotherapy
   3. Smoking history

XXIX. Non Hodgkin’s lymphoma\textsuperscript{26,27,43} (CT) (follicular lymphoma, marginal zone lymphoma, MALT lymphoma, mantle cell lymphoma, diffuse large B-cell lymphoma, Burkitt’s lymphoma, peripheral T cell lymphoma, mycosis fungoides, hairy cell leukemia post-transplant lymphoproliferative disorders, CLL/SLL)
A. Initial staging in addition to PET/CT
B. Restaging after completion of therapy to establish a new baseline
C. Surveillance
   1. Not more frequently than every 6 months for the first 2 years and not more frequently than annually thereafter

XXX. Soft tissue sarcoma\textsuperscript{28,44} [One of the following]
A. Myxoid/round cell liposarcoma (CT of the abdomen and pelvis for initial staging)
B. Retroperitoneal/intra-abdominal (includes GIST, desmoid, aggressive fibromatosis and other sarcomas) (CT of the abdomen and pelvis for initial staging)
   1. Initial staging
   2. Follow up
      a. Restaging after completion of therapy to establish a new baseline
      b. Every 3-6 months for 2-3 years (for GIST tumor every 3-6 months for 3-5 years)
      c. Every 6 months for next 2 years
      d. Annually after 4-5 years

XXXI. Testicular cancer\textsuperscript{45} [One of the following]
A. Pure seminoma (CT of the abdomen and pelvis for initial staging) [One of the following]
   1. Initial staging
   2. Follow up after treatment to establish a new baseline
3. Surveillance of Stage IA and IB tumors not treated with chemotherapy or radiation therapy [One of the following]
   a. Every 6 months for 1-2 years
   b. Every 6-12 months for year 3
   c. Annually for years 4 and 5
4. Stage 1A and IB tumors treated with single agent
   a. Annual CT of the abdomen and pelvis for 1-3 years
5. Stage IA, IB and IS treated with radiation
   a. Annual CT of the abdomen and pelvis for 1-3 years
6. Stage IIA and IIB following completion of radiation therapy [One of the following]
   a. Every 6-12 months for 1-2 years
   b. Annually for year 3
7. Stage IIB, IIC and III after chemotherapy
   a. Following completion of therapy
      i. No residual mass or mass less than or equal to 3cm with normal AFP, beta HCG and LDH may be repeated at
      ii. Residual mass >3 cm and normal AFP, beta HCG and LDH following a PET scan 6 weeks after completion of therapy if there is activity repeat the CT of the abdomen and pelvis following either retroperitoneal lymph node dissection or second line chemotherapy or RT 3-6 months after last treatment
B. Non seminoma (CT of the abdomen and pelvis for initial staging) [One of the following]
   1. Initial staging
   2. Stage IA, IB if surveillance only
      a. Every 3-4 months for 1st year
      b. Every 4-6 months for 2nd year
      c. Every 6-12 months for 3rd and 4th year
      d. Annually for 5th year
      e. Every 1-2 years
   3. Stage IB, IIA and IIB after chemotherapy
      a. Follow up after treatment to establish a new baseline
      b. Negative AFP with or without a mass
         i. Every 6 months for 1 year
         ii. Every 6-12 months for the 2nd year
         iii. Annually years 3-5
   4. Stage IB, IIA, IIB and III after chemotherapy±RPLND [one of the following]
      a. Follow up after treatment to establish a new baseline (restaging)
      b. Restaging scan shows complete response [one of the following]
         i. Every 6 months for a year
         ii. Every 6-12 months for year 2
         iii. Annually years 3-5
         iv. Then as clinically indicated
XXXII. Anal cancer\^31 [One of the following]
   A. Initial staging
   B. After completion of treatment
   C. Surveillance after first post treatment scan
      1. Annual CT scan of the abdomen and pelvis for three years if stable
      2. Annually for abdominoperineal resection
   D. Clinical suspicion of recurrence
      1. Findings on physical examination suggestive of recurrence
      2. Anorexia
      3. Weight loss
      4. Alkaline phosphatase >140 U/L
      5. Rising bilirubin (total bilirubin >1.9 mg/dL)
      6. Abdominal or pelvic pain
      7. Abdominal or pelvic mass
      8. Hepatomegaly
      9. Ascites
     10. Bowel obstruction by KUB

XXXIII. Bladder cancer\^18,22,32
   A. Initial staging if muscle invasion on biopsy
   B. Following completion of treatment and bladder in place (include imaging of upper tracts)
      1. Every 3-6 months for 2 years
   C. Following completion of treatment including cystectomy (include imaging of upper tracts)
      1. Every 3-12 months for 2 years

XXXIV. New bone lesion suspicious for a metastatic lesion with no known cancer\^29,49 [Both of the following]
   A. X-ray demonstrating a bone lesion suspicious for a metastatic lesion
   B. 40 years of age or older

XXXV. Endometrial cancer\^21,48
   A. Initial staging
   B. Follow up as clinically indicated

XXXVI. Uterine leiomyosarcoma\^48
   A. Known or suspected extraterine disease
   B. Every 3-6 months for 3 years then every 6 months for next 2 years and then annually

XXXVII. Renal cell cancer follow up of known cancer\^24,41 (CT) [One of the following]
   A. Initial staging
   B. Follow up 2-12 months after completion of treatment
   C. Annual scan for pT1NO, Nx disease
D. pT2-4 No Nx
   1. Every 6 months for 3 years
   2. Annually for an additional 2 years
E. Active surveillance (no surgery or ablation)
   1. One scan within 6 months of diagnosis
   2. Annually thereafter
F. Ablation therapy
   1. 3 months after ablative therapy
   2. 6 months after ablative therapy
   3. Annually thereafter for 5 years
G. Additional follow up as clinically indicated

XXXVIII. For Fetal Imaging, please see 74712, 74713. 100

XXXIX. Appendicitis100 (In children and pregnant women, ultrasound as the initial study except for follow-up of known appendicitis with suspected complications) [If this is not possible then CT of the abdomen and pelvis is the appropriate study 74176, 74177, or 74178. MRI abdomen 74181, 74182, or 74183 in pregnant women]

XL. Primary or metastatic bone tumor of the pelvis – known or suspected29,49,101,102. An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required[One of the following]
   A. X-ray results or CT results and suspected (not known) bone tumor [one of the following]
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
   B. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
   C. Osteosarcoma of the pelvis [One of the following] (MRI)
      1. Initial staging of primary site
      2. For high grade osteosarcoma of the pelvis after preoperative chemotherapy
      3. Restaging after completion of treatment
      4. Follow up after treatment
         a. Every 3 months for 2 years
         b. Every 4 months for the third year
         c. Every 6 months for the next 2 years (fourth and fifth)
5. Annually after 5 years
6. Restaging after completion of treatment

D. Ewing's sarcoma of the **pelvis** [One of the following] (MRI)
   1. Initial staging of primary site
   2. Restage primary site after completion of primary treatment (usually chemotherapy)
   3. Follow up after surgery, or radiation and chemotherapy
      a. Every 2-3 months for 2 years
      b. Every 4 months for the third year
      c. Every 6 months for years 4 and 5
      d. Annually after year 5

E. Chondrosarcoma of the **pelvis** [One of the following](MRI)
   1. Initial staging of primary site
   2. Restaging after completion of treatment
   3. Low grade and intracompartmental [One of the following]
      a. Every 6-12 months for 2 years
      b. Annually after 2 years as appropriate
   4. High grade (grade II, grade III or clear cell or extracompartmental)
      a. Imaging as clinically indicated

F. Chordoma of the **pelvis** [One of the following](MRI)
   1. Initial staging of primary site
   2. Restaging after completion of treatment (surgery and/or radiation therapy)
   3. Conventional or chondroid chordoma
      a. Imaging of primary site as clinically indicated

G. Giant cell tumor of the bone in the **pelvis** [One of the following](MRI)
   1. Initial staging of primary site
   2. Restaging after completion of treatment
   3. Following completion of therapy image primary site as clinically indicated

H. Osteoid osteoma [One of the following]– CT is the study of choice
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline
   5. Restaging after completion of treatment

I. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the leg with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the leg
   3. Positive bone scan in the leg with no pain
   4. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
XLI. Athletic pubalgia or Sports Hernia\textsuperscript{103,104}
A. Surgery for athletic pubalgia or sports hernia is considered investigational and/or experimental Imaging for this indication is also considered investigational and/or experimental

XLII. Planning for stereotactic or gamma knife surgery

XLIII. Generalized abdominal pain in men and also women not of childbearing age\textsuperscript{109-115} (CT of the abdomen and pelvis with contrast) [One of the following]
A. If equivocal ultrasound or
B. Pain is accompanied with any one of the following:
   1. Failure of conservative treatment for 4 weeks
   2. Cancer history
   3. Fever (101 degrees or greater)
   4. Mass
   5. GI bleeding
   6. Moderate to severe abdominal tenderness
   7. Guarding, rebound tenderness, or other peritoneal signs
   8. WBC 10,000 or greater

XLIV. Abnormal Uterine Bleeding\textsuperscript{145}
A. Initial evaluation includes any of the following:
   1. Pelvic ultrasound (CPT® 76856 or CPT® 76857) and/or Transvaginal ultrasound (CPT® 76830), saline infusion sonohysterography (CPT® 76831), hysteroscopy, D&C and/or endometrial biopsy.
B. For leiomyomas, MRI pelvis without contrast (CPT®72195) or MRI pelvis without and with contrast (CPT®72197) is appropriate for the following:
   1. Guide the treatment of myomas in an enlarged uterus with multiple myomas and/or precise myoma mapping is of clinical importance (for surgical planning), or
   2. When myomectomy is planned, before uterine artery embolization or before focused US treatment

XLV. Complex Adnexal Masses - Pre-Menopausal\textsuperscript{112}
A. If an ultrasound is indeterminate and malignancy is suspected, CT pelvis or MRI pelvis (CPT® 72197 or CPT® 72195 if pregnant) may be considered for preoperative planning if requested by the operating surgeon. Send to MD review.
B. If an ultrasound is indeterminate and ovarian malignancy is suspected, CT pelvis with contrast (CPT® 72193) or MRI pelvis (CPT® 72197 or CPT® 72195 if pregnant) may be considered for elevated tumor markers:
   1. Germ cell tumors are more common in young women which can be confirmed by beta hCG, AFP, and LDH
   2. CA 125 tumor marker can confirm for other malignancy suspicion
XLVI. Infertility Evaluation, Female

A. MRI Pelvis without contrast (CPT® 72195) MRI pelvis without and with contrast (CPT® 72197)
   1. If ultrasound defines a complex anomaly, is not definitive, or requested for surgical planning
   2. To differentiate between adenomyosis and fibroids

XLVII. Arteriovenous fistula with “high output” heart failure

A. CT Chest with contrast (CPT® 71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) OR
B. CTA Chest (CPT® 71275) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) OR
C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) OR
D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)

XLVIII. Leiomyomata/Uterine Fibroids

A. MRI pelvis without and with contrast (CPT® 72197), or without contrast (CPT® 72195;) can be used in the evaluation of leiomyomas for the following:
   1. Guide the treatment of myomas in an enlarged uterus with multiple myomas and/or precise myoma mapping is of clinical importance (for surgical planning)
   2. Equivocal sonohysterography or panoramic hysteroscopy with suspected submucous leiomyoma and imaging is needed for surgical planning
   3. Indeterminate US prior to myomectomy
   4. Leiomyoma necrosis is suspected
   5. Arterial embolization is being considered
      a. If MRI is indeterminate, MRA pelvis (CPT® 72198) or CTA pelvis (CPT® 72191) can be considered if requested by the interventional radiologist planning the arterial embolization

References:

2. ACOG Practice Bulletin No 128: Diagnosis of Abnormal Uterine Bleeding in Reproductive-Aged Women, July 2012


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44. Platt JF, Daly BD, Hara AK, et al. ACR practice guideline for the performance of magnetic resonance imaging (MRI) of the soft-tissue components of the pelvis.


53. Vasavada SP. Urethral Diverticula, Medscape reference. 


110. ACR Appropriateness Criteria®: Abnormal Vaginal Bleeding.


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72195, 72196, 72197 MRI Pelvis
72198  MRA or MRV of the Pelvis without or with Gadolinium

I.  Peripheral arterial vascular disease with abnormal ankle brachial index as defined in A and one additional of the following1-3
Note: For evaluation of PVD, if meets criteria for MRA abdomen, MRA lower extremity (one only) should be certified. An MRA of the pelvis or another lower extremity should NOT be certified.
A.  ABI (ankle brachial index, ankle systolic BP divided by brachial systolic BP)
   1.  Rest ABI <0.90 in symptomatic member
   2.  Exercise ABI <0.90 in symptomatic member with rest ABI >0.90
   3.  Toe brachial index <0.90 or pulse volume recording evidence of peripheral vascular disease if the ABI >1.30
B.  Abnormal pulses
C.  Bruit
D.  Claudication
E.  Diabetic with [One of the following]
   1.  Skin changes
   2.  Loss of hair
   3.  Poor capillary refill
   4.  Thickened nails
   5.  Thin skin
F.  Arteritis or vasculitis (Takayasu’s arteritis, giant cell arteritis) [One of the following]
   1.  ESR >22 mm/hr
   2.  Positive ANA
   3.  Positive RF or rheumatoid factor
G.  Scleroderma
H.  Hypercoagulable state [One of the following]
   1.  Antiphospholipid antibodies
   2.  Behçet's syndrome
   3.  Protein C deficiency
   4.  Protein S deficiency
   5.  Factor V Leiden deficiency
   6.  Lupus anticoagulant
   7.  Hyperactive platelet syndrome
   8.  MRHFR
   9.  Anti-cardiolipin antibodies
   10. Elevated homocysteine level
   11. Anti B2 glycoprotein antibodies
   12. Elevated fibrinogen
   13. PTT abnormal
   14. Antithrombin III antibodies
15. Oral contraceptive use
16. Hormone replacement
17. Sickle cell anemia

I. Buerger’s disease (thromboangiitis obliterans) [Both of the following]
   1. History of smoking
   2. Loss of pulses or decreased pulses in the lower extremity

J. Known atherosclerotic occlusive disease when catheter angiography fails to
   demonstrate an occult runoff vessel suitable for vascular bypass

II. Abdominal Aortic Aneurysm (AAA)\textsuperscript{37-39}

A. For non-obese patients, ultrasound (CPT\textsuperscript{®} 76775) is the preferred initial
   imaging study to screen or surveil for AAA or to evaluate a pulsatile
   abdominal mass

B. For obese patients, CT abdomen with contrast (CPT\textsuperscript{®} 74160) can be
   substituted for US using the same timeline as non-obese patient

C. One-time screening recommendations for AAA (Ultrasound (CPT\textsuperscript{®} 76775) :
   1. Men age 65 to 75 who have smoked
   2. Women and non-smokers – no routine screening
   3. Medicare covers a one-time AAA screening ultrasound (procedure code
      G0389) if there is at least one of the following risk factors:
      a. Family history of AAA
      b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes
         in his lifetime

D. Surveillance recommendations for AAA (Ultrasound (CPT\textsuperscript{®} 76775) :
   1. 2.6-2.9cm $\rightarrow$ once at 5 years
   2. 3.0-3.4cm $\rightarrow$ once at 3 years
   3. 3.5-4.4cm $\rightarrow$ annually
   4. 4.5-5.4 cm $\rightarrow$ every 6 months

E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or
   at least 1 cm in a year may undergo more frequent monitoring and should be
   evaluated by a Vascular Specialist

F. Preoperative imaging if endovascular or open repair of AAA is being
   considered (CPT\textsuperscript{®} 74177, CPT\textsuperscript{®} 74178, CPT\textsuperscript{®} 74175 or CPT\textsuperscript{®} 72191)

G. New onset of back and/or abdominal pain in a patient with a known AAA
   (CPT\textsuperscript{®} 74177, CPT\textsuperscript{®} 74178, CPT\textsuperscript{®} 74175 or CPT\textsuperscript{®} 72191)

H. Post Open Aortic Repair:
   1. Every 3 years to screen for aneurysms in the remaining aorta

I. Post Endovascular (Stent) Aortic Repair:
   1. 1 month
   2. 3 months if there was evidence of endoleak on the 1 month study
   3. 6 months
   4. 12 months
   5. Every year
III. Thoracic Aorta\textsuperscript{126-136}

NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians' preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

<table>
<thead>
<tr>
<th>Table of Thoracic Aorta Imaging Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT\textsuperscript{®} 71275, CPT\textsuperscript{®} 74175, CPT\textsuperscript{®} 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT\textsuperscript{®} 71555, CPT\textsuperscript{®} 74185, CPT\textsuperscript{®} 72198)</td>
</tr>
</tbody>
</table>

A. Aortic Dissection
1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
   a. “Medically” treated
      i. Every 6 months if total aortic diameter is \( \geq 4.5 \) cm
      ii. Annually if total aortic diameter is \( <4.5 \) cm
   b. Surgery or Stent for any type of dissection
      i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc.) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. \( \geq 4.5 \) TAA can be followed every 6 months
      iii. \( \geq 3.0 \) cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Suspicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
i. First year: 1 month, 3 months, 6 months, 12 months, then annually

4. Screening with abdominal aortic Aneurysm (AAA)
   a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)
   b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes
   1. Screening for Familial Syndromes and Genetic Syndromes
      a. Suspected Familial Thoracic Aortic Aneurysm
         i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection
      b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately
      c. Follow-Up per TAA Follow-Up guidelines
   2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
      a. Suspected, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
      b. Follow-up
         i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve
   1. Screening for Bicuspid Aortic Valve
      a. Suspected, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
         i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
         ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.
      b. Follow-up per TAA Follow-Up guidelines
         i. If no dilation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

IV. Suspected pelvic AVM\cite{1,11} [One of the following]
   A. Pulsatile pelvic mass
   B. Incidental finding on prior imaging including ultrasound
   C. Follow up of therapeutic measures

V. Pelvic pain\cite{42-47}
   A. If the initial ultrasound is equivocal for unexplained chronic pelvic pain and if pelvic congestion is suspected
      1. MRI Pelvis (CPT® 72195) or pelvis MRV (CPT® 72198), or CTV pelvis (CPT® 72191) for pelvic congestion.

VI. Pelvic trauma, with suspected vascular injury
VII. Prior to and after uterine artery embolization (MRA of the abdomen or pelvis)\(^1\)
   A. If MRI is indeterminate, MRA pelvis (CPT® 72198) or CTA pelvis (CPT® 72191) can be considered if requested by the interventional radiologist planning the arterial embolization
   B. There is no evidence to support interval MRA after embolization unless persistent or recurrent symptoms

VIII. Intestinal angina or chronic mesenteric ischemia (CTA)\(^1,19-26\)
   A. Recurrent acute episodes of abdominal pain [One of the following]
      1. Postprandial epigastric pain, occasionally radiates to the back
      2. Weight loss
      3. Fear of eating
      4. Diarrhea which may be bloody

IX. Acute mesenteric ischemia\(^19-26\) (CTA) [One of the following]

X. Evaluation of pelvic veins\(^1\) [One of the following]
   A. Suspicion of iliac vein thrombus
      1. Indeterminate duplex venous ultrasound which includes evaluation of phasic respiratory signals and swelling of the entire leg
   B. Suspicion of inferior vena cava thrombus
      1. Bilateral leg swelling
   C. May-Thurner syndrome
      1. Swelling and pain of the left leg not explained by venous ultrasound including duplex venous ultrasound
   D. Tumor invasion

XI. Evaluation of a renal transplant for suspected renal artery stenosis with Doppler ultrasound demonstrating flow in both the renal artery and renal vein\(^1\) [One of the following]
   A. New onset of hypertension
   B. Rising renal function tests

XII. Planning for TAVR\(^27\) (transcatheter aortic valve replacement) (CTA abdomen and pelvis should be done unless there is a documented contraindication to CT)

XIII. Arteriovenous fistula with “high output” heart failure:\(^28-29\)
   A. CT Chest with contrast (CPT® 71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) OR
   B. CTA Chest (CPT® 71275) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) OR
   C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) OR
   D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)
XIV. Iliac Artery Aneurysm (IAA)\textsuperscript{37, 39}
A. Evaluation of a suspected IAA should begin with ultrasound
B. If ultrasound is equivocal, CT pelvis with contrast (CPT\textsuperscript{®} 72193) may be performed
C. Follow-up imaging studies can be performed annually
D. Preoperative imaging if endovascular or open repair is being considered (CPT\textsuperscript{®} 74177, CPT\textsuperscript{®} 74178, or CPT\textsuperscript{®} 74174)
E. Post endovascular iliac repair (stent): (CPT\textsuperscript{®} 72191, CPT\textsuperscript{®} 72193, CPT\textsuperscript{®} 72194, or CPT\textsuperscript{®} 72198)
   1. 1 week
   2. 1 month
   3. 3 months
   4. 6 months
   5. Every 6 months thereafter

XV. Leiomyomata/Uterine Fibroids\textsuperscript{41, 42, 48-50}
A. MRI pelvis without and with contrast (CPT\textsuperscript{®} 72197), or without contrast (CPT\textsuperscript{®} 72195) can be used in the evaluation of leiomyomas for the following:
   1. Guide the treatment of myomas in an enlarged uterus with multiple myomas and/or precise myoma mapping is of clinical importance (for surgical planning)
   2. Equivocal sonohysterography or panoramic hysteroscopy with suspected submucous leiomyoma and imaging is needed for surgical planning
   3. Indeterminate US prior to myomectomy
   4. Leiomyoma necrosis is suspected
   5. Arterial embolization is being considered
      a. If MRI is indeterminate, MRA pelvis (CPT\textsuperscript{®} 72198) or CTA pelvis (CPT\textsuperscript{®} 72191) can be considered if requested by the interventional radiologist planning the arterial embolization
      b. Post-embolization
         i. There is no evidence to support CTA or MRA after embolization unless persistent or recurrent symptoms

XVI. Chronic Pelvic Pain
A. If the initial ultrasound is equivocal for unexplained chronic pelvic pain, or unexplained chronic pelvic pain and pelvic congestion is suspected, then the following can be considered:
   1. CT pelvis with contrast (CPT\textsuperscript{®} 72193) or CT abdomen and pelvis with contrast (CPT\textsuperscript{®} 74177) for unexplained chronic pelvic pain
   2. MRI Pelvis (CPT\textsuperscript{®} 72195) or pelvis MRV (CPT\textsuperscript{®} 72198), or CTV pelvis (CPT\textsuperscript{®} 72191) for pelvic congestion
References:
1. American College of Radiology (ACR), North American Society for Cardiovascular Imaging (NASCI), Society for Pediatric Radiology (SPR). ACR-NASCI-SPR practice guideline for the performance of pediatric and adult body magnetic resonance angiography (MRA) [online publication].
73200 CT of the Upper Extremity without Contrast
73201 CT of the Upper Extremity with Contrast
73202 CT of the Upper Extremity without and with Contrast

I. Suspected nonunion of known fracture with pain at fracture site
   [One of the following]
   A. Failure to demonstrate progressive evidence of healing for 3 or more months
   B. Movement at fracture site by subjective sensation or by radiographic imaging
   C. Old scaphoid fracture on x-ray see XVI

II. Primary or metastatic bone tumor of the upper extremity – known or suspected1-4 – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required
   [One of the following]
   A. X-ray or CT results and suspected (not known) bone tumor [One of the following]
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
      6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
      7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast, or CT without may be indicated if one of the following applies:
         a. Diagnosis uncertain based on x-ray appearance.
         b. Imaging requested for preoperative planning
   B. Osteosarcoma of the upper extremity [One of the following] (MRI)
      1. Initial staging of primary site
      2. After preoperative chemotherapy
      3. At 6 weeks following local control surgery
      4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
      5. Follow up after treatment
         a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
   i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
   ii. To clarify inconclusive findings on plain x-ray
   iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the upper extremity
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity (MRI)
   1. Initial staging of primary site
2. Restaging after completion of radiotherapy
3. Every 2 cycles during chemotherapy
4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma – CT is the study of choice.
1. Clinical [One of the following]
   a. Bone pain worse at night which is relieved by aspirin
   b. Pain increases with activity
2. Known diagnosis and planning for surgery
3. Known diagnosis and planning for radiofrequency ablation
4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone (MRI without contrast) [One of the following]
1. Bone pain in the upper extremity with known malignancy and non-diagnostic bone scan
2. Known bone metastases in the upper extremity with pathologic fracture
3. Positive bone scan in the arm with no pain
4. Restaging after completion of treatment

III. Soft tissue mass including soft tissue sarcoma\(^5\text{-}^9\) (MRI without and with contrast) [One of the following]
Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
A. Nondiagnostic initial x-ray study
B. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
      a. After preoperative radiotherapy and preoperative planning prior to resection
      b. After surgical resection
      c. After adjuvant radiotherapy
      d. Suspected local recurrence
      e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
   3. Surveillance:
      a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
      b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
   4. Suspicion of local recurrence\(^10\)
IV. Joint Replacement Surgery [One of the following]
   A. Pre-operative planning for joint replacement when congenital, or post-traumatic deformities are present in the elbow, and wrist. CT Shoulder without contrast (CPT®73200) and/or MRI Shoulder without contrast (CPT®73221) are considered medically necessary for preoperative planning prior to shoulder replacement
   B. Pain after joint replacement with negative x-ray
   C. Loosening of prosthesis on x-ray with negative aspiration for infection and negative In111 white blood cell and sulfur colloid scan of the joint. CT shoulder without contrast (CPT® 73200) can be performed as additional imaging following x-rays regardless of x-ray findings
   D. CT without contrast is appropriate with a high suspicion for a periprosthetic fracture and a negative x-ray. CT shoulder without contrast (CPT® 73200) can be performed as additional imaging following x-rays regardless of x-ray findings
   E. Post-Operative Elbow Replacement Surgery -. CT elbow without contrast (CPT® 73200) for suspected aseptic loosening or fracture replacement when recent x-ray is nondiagnostic

V. Complex fracture, CT required for treatment planning [One of the following]
   A. Comminuted, intra-articular distal radius fracture on x-ray
   B. Fracture of the navicular or scaphoid on x-ray
   C. Surgical planning of complex intra-articular fractures
   D. Growth Plate Injuries (Salter-Harris Fractures) - In case of severe injury with displacement of bone fractures, CT may be indicated prior to surgical intervention

VI. Fracture11 [One of the following] [MRI]
   A. Suspicion of fracture of distal radius
      1. Casting and negative x-ray 10-14 days after injury (There may be a negative x-ray at the time of injury)
   B. Suspected acute fracture of the navicular or scaphoid with negative x-ray at time of injury
   C. Suspected occult fracture of the scaphoid with a negative initial x-ray and pain or tenderness over the anatomic “snuff box” and no improvement after 10-14 days of casting
   D. Olecranon fracture
   E. All other suspected, occult or insufficiency fractures of the upper extremity including the humerus, ulna, radius, carpal bones, metacarpals, and phalanges with negative x-rays
      1. Repeat x-rays remain non-diagnostic for fracture after minimum of 10 days of provider-directed conservative treatment
      2. Initial x-rays obtained a minimum of 14 days after the injury or onset of pain are non-diagnostic for fracture
   F. Child abuse
VII. Suspected intra-articular loose body\textsuperscript{12} and recent x-ray (MRI) [One of the following]
   A. Joint pain
   B. Locking
   C. Clicking

VIII. Distal radioulnar joint subluxation\textsuperscript{11}
   A. Non diagnostic x-ray

IX. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]
   A. Aural temperature >38.3°C or >100.9°F
   B. Leukocytosis, WBC >11,500/cu.mm
   C. ESR >22 mm/hr
   D. CRP >10 mg/L

X. Heterotopic ossification/osteophytosis on x-ray with stiff elbow\textsuperscript{12}

XI. CT arthrogram of the shoulder (CT with contrast)\textsuperscript{13} [One of the following]
   A. Pain with non contributory x-rays and non specific examination if MRI is contraindicated
   B. Labral tear with noncontributory x-rays if MRI is contraindicated
   C. Shoulder Rotator Cuff Tear (Complete and Partial) with noncontributory x-rays if MRI is contraindicated. Conservative treatment is not required with an acute shoulder injury prior to the onset of symptoms and consideration of surgery.
   D. Impingement with noncontributory x-rays if MRI is contraindicated
   E. MRI arthrogram or CT arthrogram is appropriate when joint sparing/salvage reconstructive surgery is planned for the following:
      1. Suspected concomitant rotator cuff tear of the shoulder
      2. Suspected concomitant labral tear of the shoulder
   F. Post Operative shoulder surgery for Rotator cuff tear, Impingement, and/or Labral tear after x-ray and 6 weeks of conservative treatment
   G. Prior shoulder arthroplasty and non contributory x-rays if ultrasound or x-ray arthrogram cannot be done (must document reason that either or both tests cannot be performed)

XII. Elbow - Post-Operative CT elbow without contrast (CPT\textsuperscript{®}73200) in symptomatic postoperative patients following surgical treatment of complex fractures

XIII. Labral tear – See XI

XIV. Rotator cuff tear or impingement – See XI

XV. Shoulder pain – See XI

XVI. Kienböck’s disease on x-ray\textsuperscript{14}
XVII. Old scaphoid fracture on x-ray (either CT or MRI but not both)\textsuperscript{14}

XVIII. Hand\textsuperscript{15-16}

A. Complex Fracture – CT upper extremity (hand or finger) without contrast (CPT\textsuperscript{®} 73200) when x-ray shows a complex fracture

B. Post-operative - CT upper extremity without contrast (CPT\textsuperscript{®} 73200) or MRI upper extremity without contrast (CPT\textsuperscript{®} 73221) in symptomatic post-op patients following surgical treatment for complex hand fractures or MRI upper extremity, any joint, without contrast (CPT\textsuperscript{®} 73221) in symptomatic post-op patients following soft-tissue surgery.
1. X-Ray
2. Conservative treatment

XIX. Wrist

A. Distal Radioulnar Joint (DRUJ) Instability with noncontributory x-rays CT of both wrists without contrast (CPT\textsuperscript{®} 73200) should include wrists in supination and pronation

B. Post-Operative - following x-ray and 6 weeks conservative treatment - CT wrist without contrast (CPT\textsuperscript{®} 73200) in symptomatic patients following surgery for navicular/scaphoid fractures and complex distal radius/ulna fractures

XX. AVN - Advanced imaging for AVN confirmed by x-ray is-confirmed AVN is appropriate in the following situations:

A. Humeral head: preoperative planning prior to shoulder replacement: CT Shoulder without contrast (CPT\textsuperscript{®} 73200) and/or MRI Shoulder without contrast (CPT\textsuperscript{®} 73221).

B. Lunate (Kienbock's Disease)/Scaphoid (Preiser's Disease): CT Wrist without contrast (CPT\textsuperscript{®} 73200) or MRI Wrist without contrast (CPT\textsuperscript{®} 73221).

XXI. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures

A. X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated.

B. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays

XXII. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest after x-rays rule out the presence of radiopaque foreign bodies.

XXIII. Gout- CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi when infection or neoplasm is in differential diagnosis

XXIV. Septic Joint
A. Analysis of joint fluid is most often sufficient to diagnose a septic joint. An MRI of the joint, without/and with contrast is appropriate when standard or image-guided arthrocentesis is contraindicated, unsuccessful, or non-diagnostic, and the clinical documentation satisfies ALL of the following criteria:

1. History and physical examination findings [One of the following]:
   a. Development of an acutely hot and swollen joint (< 2 weeks)
   b. Decreased range of motion due to pain
   c. Documented fever
2. Laboratory tests [One of the following]:
   a. Leukocytosis
   b. Elevated ESR or C-reactive protein
   c. Analysis of the joint fluid is non-diagnostic
3. X-ray of the joint

B. MRI without and with contrast is appropriate after x-rays if the arthrocentesis is diagnostic and if there is a confirmed septic joint, to evaluate the extent of infection into the soft tissues and any skip lesions that would require evaluation.

C. CT with contrast can replace MRI without and with contrast if MRI is contraindicated

References:

17. ACR Appropriateness Criteria, Musculoskeletal Imaging topics.

73200, 73201, 73202 CT of the Upper Extremity
I. **Suspected occlusion, stenosis** [One of the following]
   A. Abnormal pulses: asymmetric, weak or absent
   B. Skin changes: poor capillary filling, cyanosis
   C. Abnormal Doppler ultrasound
   D. Reconstruction surgery planning
   E. Thoracic outlet syndrome [One of the following]
      1. Cold extremity or digits
      2. Pallor
      3. Decreased pulses
      4. Decreased blood pressure in one arm
      5. Change in pulse or blood pressure with change in position of arm or head
         (positive Adson’s maneuver or Allen test)
   F. Effort thrombosis [One of the following]
      1. Swelling
      2. Cyanosis
      3. Evidence of collateral veins
   G. Arteritis (Takayasu’s arteritis, giant cell arteritis) [One of the following]
      1. ESR >22 mm/hr
      2. Positive ANA
      3. Positive RF or rheumatoid factor
   H. Scleroderma
   I. Hypercoagulable state [One of the following]
      1. Personal history of cancer
      2. Factor V Leiden mutation
      3. MTHFR
      4. SLE
      5. Sickle cell disease
      6. Contraceptive medications
      7. Protein C deficiency
      8. Protein S deficiency
      9. Antiphospholipid antibodies
      10. Elevated lipoprotein (a)
      11. Elevated platelet count
      12. Prothrombin 20210 gene mutation
      13. Antithrombin III deficiency
   J. Buerger’s disease (thromboangiitis obliterans) [Both of the following]
      1. History of smoking
      2. Loss of pulses or decreased pulses in the upper extremity

II. **Aneurysm**
   A. Pulsatile mass by palpation or imaging

III. **Venous aneurysm with negative ultrasound**
A. Asymptomatic peripheral mass

IV. Arteriovenous malformation or venous malformation\(^2\) [One of the following]
A. Hypertrophy of soft tissues of the extremity
B. Limb length discrepancy
C. History of Klippel-Trenaunay syndrome of variant
D. History of Osler Weber Rendu syndrome
E. History of Parkes-Weber syndrome
F. Hemorrhage into a limb
G. Thrill or bruit
H. Port-wine stain
I. Dilated veins
J. Congenital lipomatous overgrowth
K. Vascular malformations
L. Epidermal nevi
M. Scoliosis/skeletal/spinal anomalies (CLOVES) syndrome

V. Upper extremity venous thrombosis\(^3\)
A. Duplex venous ultrasound including compression is equivocal

References:

73218 MRI Upper Extremity Other than Joint Including Hand without Contrast

I. Suspected fracture with negative x-ray (including occult fracture or insufficiency fracture)$^{1-3}$ [One of the following]
   A. Suspicion of fracture of distal radius
      1. Casting and negative x-ray 10-14 days after injury (There may be a negative x-ray at the time of injury)
   B. Suspected acute fracture of the navicular or scaphoid with negative x-ray at time of injury
   C. Suspected occult fracture of the navicular or scaphoid with a negative initial x-ray and pain or tenderness over the anatomic “snuff box” and no improvement after 10-14 days of casting and negative repeat x-ray at 10-14 days after injury
   D. Olecranon fracture
   E. All other suspected, occult or insufficiency fractures of the upper extremity including the humerus, ulna, radius, carpal bones, metacarpals and phalanges with negative x-rays
      1. Repeat x-rays remain non-diagnostic for fracture after minimum of 10 days of provider-directed conservative treatment
      2. Initial x-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture
   F. Child abuse
   G. Stress fracture - MRI without contrast of the area of interest is allowed as follow-up imaging for “return to play” evaluation at least 3 months after the initial imaging study.

II. Suspected soft tissue injury$^{1-8}$ [One of the following]
   A. Gamekeeper’s thumb or injury or skier’s thumb (metacarpophalangeal ulnar collateral ligament injury)
      1. Negative x-ray
   B. Biceps tendon tear near the shoulder with incomplete resolution with conservative management [Both of the following]
      1. Symptoms [One of the following]
         a. Sudden sharp pain in the upper arm
         b. Pop or snap can be heard
         c. Cramping of upper arm over the biceps with use of the arm
         d. Bruising of the upper arm
         e. Pain or tenderness
         f. Weakness of the shoulder or elbow on examination
         g. Difficulty with pronation and/or supination
         h. Bulge in the upper arm
         i. Defect over the muscle
2. Conservative management to include NSAIDS or anti-inflammatory medication and physical therapy for at least 4 weeks

C. Biceps tear above the elbow with negative x-ray [One of the following]
   1. Swelling in the front of the elbow
   2. Bruising near the elbow and in the forearm
   3. Weakness in bending of the elbow
   4. Weakness in twisting the forearm (supination)
   5. Bulge in the upper arm
   6. Defect in the muscle near the elbow

D. Collateral ligament tear with negative x-rays
   1. Ulna collateral ligament (medial) at the elbow with pain medially
      a. Symptoms [One of the following]
         i. Tenderness over the medial aspect of the elbow
         ii. Loss of range of motion
         iii. Bruising
         iv. Pain reproduced with a clenched fist
   2. Radial collateral ligament injury at the elbow (lateral) with pain laterally
      [One of the following]
      a. Tenderness over the lateral aspect of the elbow
      b. Varus instability
      c. Positive chair rise test
      d. Positive pivot shift test
   3. Olecranon bursitis swelling of the posterior elbow with or without pain and no improvement after least 4 weeks of anti-inflammatory medication, ice

E. Flexor tendon injuries [One of the following]
   1. Inability to flex fingers or thumb
   2. Numbness of the fingertip
   3. History of rheumatoid arthritis
   4. History of deep cut of fingers, wrist or forearm
   5. Sports injury “jersey finger”

III. Tendinitis, tendinopathy, or tendinosis\textsuperscript{9-13} [One of the following]

A. Lateral epicondylitis or tennis elbow (imaging is rarely required) with negative x-ray, pain along the lateral elbow which increases with grasping and twisting and decreases with rest [Both of the following]
   1. No improvement with at least 6 weeks of anti-inflammatory medication and home exercise program
   2. No improvement with formal physical therapy program

B. Medial epicondylitis or golfer’s elbow with pain on the medial side of the elbow, a negative x-ray and incomplete resolution with at least 4 weeks of anti-inflammatory medication, activity modification or rest, ice, and physical therapy

C. Bicipital or biceps tendonitis with incomplete resolution after conservative medical management consisting of treatment with anti-inflammatory medication and physical therapy for at least 4 weeks or findings worsening during trial of conservative management [One of the following]
   1. Findings on exam [One of the following]
a. Tenderness over the bicipital groove on examination
b. Positive Yergason’s test
c. Positive Speed’s test
d. Pain increases with flexion of the shoulder against resistance
e. Pain with overhead activity

2. Symptoms near the elbow with pain anterior to the elbow
   a. Weakness of the elbow

D. **Triceps tendinosis or tendinopathy** with tenderness over the triceps tendon, a negative x-ray and incomplete resolution with steroid injections or anti-inflammatory medication and physical therapy for at least 4 weeks

E. **Olecranon impingement** with clicking or locking of the elbow at terminal extension with either a normal x-ray or one that shows osteophytes or loose bodies

F. **DeQuervain’s tendinitis** with no improvement after 4 weeks of conservative therapy consisting of anti-inflammatory medications or injections into the tendon sheath [One of the following]
   1. Pain over the radial side of the wrist
   2. Positive Finkelstein’s test

IV. **Ulnar nerve entrapment**\textsuperscript{12,13} with medial elbow pain (imaging is not usually required and a definitive diagnosis is made with nerve conduction studies) [Both of the following]

A. Symptoms or findings on examination [One of the following]
   1. Distal paresthesias of the forearm and 4th and 5th fingers
   2. Positive Tinel’s sign over the medial epicondyle
   3. Atrophy of the hypothenar eminence
   4. Index finger pinch weakness (positive Froment’s sign)
   5. Decreased grip strength
   6. Weakness of the intrinsic hand muscles

B. Conservative management for at least 4 weeks
   1. Activity modification
   2. Night time splinting

V. **Evaluation of the intrinsic muscles of the hand** [One of the following]

A. Atrophy of any hand muscles

B. Motor and sensory deficits of the hand unexplained by physical examination and EMG

VI. **Arteriovenous malformation or venous malformation**\textsuperscript{14-17} [One of the following]

A. Hypertrophy of soft tissues of the extremity

B. Limb length discrepancy

C. History of Klippel-Trenaunay syndrome of variant

D. History of Osler-Weber-Rendu syndrome

E. History of Parkes-Weber syndrome

F. Hemorrhage into a limb
G. Pulsating soft tissue mass [One of the following]
   1. Thrill
   2. Bruit
H. Port-wine stain
I. Dilated veins
J. Congenital lipomatous overgrowth
K. Vascular malformations
L. Epidermal nevi
M. Scoliosis/skeletal/spinal anomalies (CLOVES) syndrome
N. Capillary malformations also known as port wine stains are characterized by a collection of small vascular channels in the dermis and generally do not require imaging because the diagnosis is made clinically. However, MR imaging may be required to evaluate an occult underlying neurologic structures, since these malformations are associated with encephalocele, spinal dysraphism, or Sturge-Weber syndrome

VII. Suspected or known avascular necrosis with pain and a recent x-ray which may be either negative or non-diagnostic or diagnostic of AVN but additional information is needed to determine management (osteonecrosis, OCD, AVN, Kienböck’s disease, Preiser’s Disease)\(^\text{16-17}\) [(A and B) or C]

A. Risk factors and pain [One of the following]
   1. Steroid use
   2. Sickle cell disease
   3. Excessive alcohol use
   4. HIV infection
   5. SLE
   6. Renal transplant
   7. Trauma [One of the following]
      a. Fracture
      b. Dislocation
   8. Coagulopathy
   9. Bisphosphonates
   10. Smoking
   11. Pancreatitis
   12. Gaucher’s disease

B. Physical findings [One of the following]
   1. Catching
   2. Locking
   3. Clicking
   4. Grinding
   5. Crepitus
   6. Stiffness
   7. Tenderness
   8. Flexion contractures

C. Clarification of findings on recent x-ray
VIII. Primary or metastatic bone tumor of the upper extremity – known or suspected\(^\text{18-20}\) – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]

A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
   1. Negative or does not explain the regional symptoms (MRI without contrast)
   2. Suspicious for osteoid osteoma clinically or radiographically (CT)
   3. Indeterminate for malignancy (MRI without and with contrast)
   4. Aggressive appearance on x-ray (MRI without and with contrast)
   5. Pathologic fracture; not definitely benign (MRI without and with contrast)
   6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
   7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or and/or CT without and with contrast may be indicated if one of the following applies:
      a. Diagnosis uncertain based on x-ray appearance
      b. Imaging requested for preoperative planning

B. Osteosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging– every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year and annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment]
a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
   i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
   ii. To clarify inconclusive findings on plain x-ray
   iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the upper extremity with known malignancy and non-diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the upper extremity
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non-diagnostic bone scan
   4. Positive bone scan in the upper extremity with no pain

IX. **Soft tissue mass including soft tissue sarcoma**[^21-24] ([MRI without and with contrast]) [One of the following]

Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.

A. Nondiagnostic initial x-ray study

B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration

C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
      a. After preoperative radiotherapy and preoperative planning prior to resection
      b. After surgical resection
      c. After adjuvant radiotherapy
      d. Suspected local recurrence
         Every 2 cycles to assess response to chemotherapy for patients with measurable disease

3. Surveillance:
   a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
   b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually

4. Suspicion of local recurrence

X. **Brachial plexus injury or plexopathy**

See MRI of the Upper Extremity Other Than Joint Without and With Contrast, CPT code 73220

XI. **Child abuse**

XII. **Soft tissue abscess with negative ultrasound and tender or warm or erythematous area** [One of the following]

A. Aural temperature >38.3°C or > 100.9°F
B. Leukocytosis, WBC > 11,500/cu.mm
C. ESR >22mm/hr
D. CRP >10 mg/L

[^21-24]: UnitedHealthcare Medicare Solutions Criteria for Imaging V1.0.2018

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XIII. Osteochondral defect or osteochondritis dissecans\(^{25,26}\) [One of the following]
   A. Positive x-ray for osteochondral defect to stage for stability
   B. Catching, or stiffness or locking or instability with negative x-ray
   C. Chronic joint pain after trauma despite appropriate treatment and a negative x-ray
   D. Effusion or crepitus or tenderness with negative x-ray
   E. X-rays are negative and an osteochondral fracture is still suspected
   F. X-ray and clinical exam suggest an unstable osteochondral injury
   G. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays

XIV. Hand\(^{22-23}\)
   A. General Hand Pain – MRI upper extremity, other than joint (Hand) without contrast (CPT® 73218)
      1. X-Ray
      2. Conservative treatment

XV. Ulnar Neuropathy\(^{33-35}\)
   A. Initial EMG/NCV (electromyogram or nerve conduction velocity)
   B. For pre-op only: MRI of the elbow without contrast (CPT®73221) or MRI of the upper arm forearm without contrast (CPT®73218)

XVI. Radial Neuropathy\(^{33-35}\)
   A. Initial EMG/NCV (electromyogram or nerve conduction velocity)
   B. MRI of the upper arm or forearm without contrast (CPT®73218) in severe cases when surgery is being considered.

XVII. Gout
   A. CT without contrast, or MRI without contrast, or MRI with contrast of the area of interest is indicated for soft-tissue tophi, when infection or neoplasm is in the differential diagnosis

XVIII. Paget’s Disease
   A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt.
   B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

References:

29. ACR Appropriateness Criteria, Musculoskeletal Imaging topics.
I. Suspected or known osteomyelitis with bone pain\(^1\)\(^{-6}\) [One of the following]
   A. Clinical and laboratory findings [One of the following]
      1. ESR >22 mm/hr
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/cu.mm
      4. C-reactive protein >10 mg/L
      5. Blood culture positive
      6. X-ray suggestive of osteomyelitis
   B. History of diabetes, dialysis or peripheral vascular disease
   C. History of penetrating injury or surgery near the involved bone
   D. Sinus tract, poor wound or fracture healing
   E. Preoperative evaluation of osteomyelitis
   F. Positive probe to bone test
   G. Post-treatment evaluation
   H. Suspicion of infected prosthesis (nuclear studies)
   I. Chronic wound overlying surgical hardware
   J. Chronic wound overlying a fracture
   K. Exposed bone

II. Primary or metastatic bone tumor of the upper extremity – known or suspected\(^7\)\(^{-9}\) – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
      6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the upper extremity with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the upper extremity
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the upper extremity with no pain

III. Soft tissue mass including soft tissue sarcoma\textsuperscript{10-13}(MRI without and with contrast) [One of the following]

Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.

A. Nondiagnostic initial x-ray study
B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
C. Soft tissue sarcoma of the extremity [One of the following]
1. Initial staging of primary site
2. Restaging:
   a. After preoperative radiotherapy and preoperative planning prior to resection
   b. After surgical resection
   c. After adjuvant radiotherapy
d. Suspected local recurrence
e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
3. Surveillance
   a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
   b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
4. Suspicion of local recurrence

IV. Arteriovenous malformation or venous malformation

A. Hypertrophy of soft tissues of the extremity
B. Limb length discrepancy
C. History of Klippel-Trenaunay syndrome of variant
D. History of Osler-Weber-Rendu syndrome
E. History of Parkes-Weber syndrome
F. Hemorrhage into a limb
G. Reddish pulsatile mass
   1. Thrill
   2. Bruit
H. Port-wine stain
I. Dilated veins
J. Congenital lipomatous overgrowth
K. Vascular malformations
L. Epidermal nevi
M. Scoliosis/skeletal/spinal anomalies (CLOVES) syndrome
N. Capillary malformations also known as port wine stains are characterized by a collection of small vascular channels in the dermis and generally do not require imaging because the diagnosis is made clinically. However, MR imaging may be required to evaluate an occult underlying neurologic structures, since these malformations are associated with encephalocele, spinal dysraphism, or Sturge-Weber syndrome

V. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area

A. Aural temperature >38.3°C or >100.9°F
B. Leukocytosis, WBC >11,500/cu.mm
C. ESR >22 mm/hr
D. CRP >10 mg/L
VI. Brachial plexus\textsuperscript{18,19} [One of the following]

A. Brachial plexus injury [Both of the following]
   1. Symptoms [One of the following]
      a. Weakness or paralysis of the upper extremity
      b. Sensory loss or numbness of the upper extremity
      c. Horner's syndrome
      d. Shoulder and/or arm pain
      e. Burning or electric sensation in more than one nerve distribution
      f. Loss of deep tendon reflexes in the upper extremity
      g. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels
   2. History [One of the following]
      a. Trauma including birth trauma, motor vehicle accident, falls, sports injuries, gun shot injury, overuse of backpacks
      b. Radiation fibrosis
      c. History of radiation therapy to the chest, breast, or axilla

B. Primary or metastatic tumor [Both of the following]
   1. Symptoms [One of the following]
      a. Weakness or paralysis of the upper extremity
      b. Sensory loss or numbness of the upper extremity
      c. Horner's syndrome
      d. Shoulder and/or arm pain
      e. Burning or electric sensation in more than one nerve distribution
      f. Loss of deep tendon reflexes in the upper extremity
      g. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels
   2. History [One of the following]
      a. Known primary tumor
      b. Lung cancer especially a Pancoast tumor
      c. Lymphoma

C. Schwannoma or neurofibroma
   1. Symptoms [One of the following]
      a. Palpable mass in the lower neck or supraclavicular fossa
      b. Weakness or paralysis of the upper extremity
      c. Sensory loss or numbness in the upper extremity
      d. Horner's syndrome
      e. Shoulder and/or arm pain
      f. Burning or electric sensation in more than one nerve distribution
      g. Loss of deep tendon reflexes in the upper extremity
      h. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels

D. Entrapment
   1. Symptoms [One of the following]
      a. Pain and paresthesia along the ulna aspect of the forearm, hand and 4th and 5th fingers
      b. Symptoms increase with overhead activities
VII. Radial Neuropathy²⁰-²²
   A. Initial EMG/NCV (electromyogram or nerve conduction velocity)
   B. MRI of the upper arm or forearm without and with contrast (CPT® 73220) in severe cases when surgery is being considered and there is a suspicion of a nerve tumor such as a neuroma

VIII. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest after x-rays rule out the presence of radiopaque foreign bodies.

IX. Gout- CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi when infection or neoplasm is in differential diagnosis

X. Paget’s Disease
   A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt.
   B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

XI. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures - If x-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated.

References:

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73219, 73220 MRI Upper Extremity Other than Joint
73221  MRI Upper Extremity Joint without Gadolinium:
Shoulder
See Also: Elbow, Wrist

I. Chronic joint pain (longer than 6 months) with negative x-ray\(^1,2\)
   A. Incomplete resolution with conservative medical management [One of the following]
      1. Continued pain after treatment with anti-inflammatory medication and physical therapy for at least 4 weeks
      2. Symptoms worsening while under treatment

II. Adhesive capsulitis with negative x-rays\(^2,3\) and incomplete resolution with at least 4 weeks of anti-inflammatory medication and physical therapy (imaging is rarely required)
   A. Diffuse shoulder pain with restricted passive range of motion
   B. Positive Apley scratch test

III. Acromioclavicular arthritis\(^2\)
   A. Superior shoulder pain
   B. Tenderness over the acromioclavicular (AC) joint
   C. Painful cross body adduction test

IV. Suspected intra-articular loose body and recent x-ray\(^1\) [One of the following]
   A. Joint pain
   B. Locking
   C. Clicking

V. Suspected or known avascular necrosis\(^4\) (osteonecrosis, AVN) with pain and recent x-ray which may be either negative or non-diagnostic or diagnostic of AVN but additional information is needed to determine management [One risk factor and one selection from history or physical finding or clarification of findings on other imaging]
   A. Risk factors and pain [One of the following]
      1. Steroid use
      2. Sickle cell disease
      3. Excessive alcohol use
      4. HIV infection
      5. SLE
      6. Renal transplant
      7. Trauma [One of the following]
         a. Fracture
         b. Dislocation
8. Coagulopathy
9. Bisphosphonate use
10. Smoking
11. Pancreatitis
12. Gaucher’s disease

B. Physical findings [One of the following]
1. Catching
2. Locking
3. Clicking
4. Grinding
5. Crepitus
6. Stiffness
7. Tenderness over the shoulder
8. Flexion contractures

VI. Suspected fracture with negative x-ray\(^5,6\) [One of the following]
A. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:
   1. Repeat x-rays remain non-diagnostic for fracture after minimum of 10 of provider-directed conservative treatment,
   2. Initial x-rays obtained a minimum of 14 days after the injury or onset of pain are non-diagnostic for fracture
B. Child abuse
C. Bone scan positive but not specific for fracture
D. Osteoporosis on bone density or long term steroid use
E. Stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study

VII. Suspected acute rotator cuff tear with or without acromial spurs on x-ray\(^7\) and incomplete resolution with conservative medical management consisting of treatment with anti-inflammatory medication and physical therapy for at least 4 weeks or symptoms worsening during trial of conservative management [(One symptom and one finding on examination) or C]
A. Symptoms [One of the following]
   1. Pain especially with overhead activities such as reaching or combing hair
   2. Pain increases when sleeping of the affected side
   3. Inability to use the arm or lift the arm
B. Findings on examination [One of the following]
   1. Weakness on examination
   2. Subacromial tenderness
   3. Positive Apley’s scratch test
   4. Positive Neer sign
   5. Positive apprehension test
   6. Positive drop arm test
7. Positive empty can sign
8. Positive relocation sign
9. Positive sulcus sign

C. Recurrent pain and finding(s) in B above following surgery

VIII. Suspected chronic rotator cuff tendinitis\(^2\) with or without acromial spurs on x-ray (if performed) and incomplete resolution with conservative medical management consisting of treatment with anti-inflammatory medication and physical therapy for at least 4 weeks or symptoms or findings worsening during trial of conservative management [(One symptom and one finding on examination) or C]

A. Symptoms [One of the following]
   1. Dull aching in the shoulder, which may interfere with sleep
   2. Severe pain when the arm is actively abduced into an overhead position such as throwing, reaching or combing hair

B. Findings on examination [One of the following]
   1. Weakness on examination
   2. Subacromial tenderness
   3. Positive Apley’s scratch test
   4. Positive Neer sign
   5. Positive apprehension test
   6. Positive drop arm test
   7. Positive empty can sign
   8. Positive relocation sign
   9. Positive sulcus sign

C. Recurrent pain following surgery and finding(s) in B above

IX. Bicipital tendonitis (biceps tendonitis)\(^{11-13}\) incomplete resolution with conservative medical management consisting of treatment with anti-inflammatory medication and physical therapy for at least 4 weeks or findings worsening during trial of conservative management [Both of the following]

A. Findings on exam [One of the following]
   1. Tenderness over the bicipital groove on examination
   2. Positive Yergason’s test
   3. Positive Speed’s test
   4. Pain increases with flexion of the shoulder against resistance
   5. Pain with overhead activity

X. Muscle tear [One of the following]

A. Symptoms [One of the following]
   1. Pain and swelling over the muscle
   2. Bruising over the muscle
   3. Bulge
   4. Defect in the muscle
XI. Biceps tendon tear\(^{11-13}\) with incomplete resolution with at least 4 weeks of conservative medical management consisting of anti-inflammatory medication and physical therapy or worsening of symptoms during trial of conservative management
A. Symptoms [One of the following]
   1. Sudden sharp pain in the upper arm
   2. Pop or snap can be heard
   3. Cramping of upper arm over the biceps with use of the arm
   4. Bruising of the upper arm
   5. Pain or tenderness
   6. Weakness of the shoulder or elbow on examination
   7. Difficulty with pronation and/or supination
   8. Bulge in the upper arm
   9. Defect over the muscle

XII. Rotator cuff impingement syndrome\(^{1,2,14}\) or shoulder bursitis with or without an x-ray showing either acromial spur, calcification of the coracoacromial ligament or acromioclavicular arthritis and incomplete resolution with at least 4 weeks of physical therapy and anti-inflammatory medication or symptoms worsening while on conservative management [One of the following]
A. Symptoms
   1. Shoulder pain increased by overhead movements
   2. Pain interfering with sleep when lying on the affected side
   3. Positive Hawkins’ test

XIII. Joint Replacement Surgery
A. Preoperative Shoulder (Glenohumeral) Replacement Surgery following x-ray and 6 weeks conservative treatment - CT shoulder without contrast (CPT®73200) and/or MRI shoulder without contrast (CPT®73221) for preoperative planning prior to shoulder replacement
B. Post-Operative Shoulder (Glenohumeral) Replacement Surgery following x-ray - MRI shoulder without contrast (CPT®73221) for possible nerve injury

XIV. Soft tissue mass including soft tissue sarcoma\(^{15-19}\) (MRI without and with contrast) [One of the following]
Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
A. Nondiagnostic initial x-ray study
B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
a. After preoperative radiotherapy and preoperative planning prior to resection
b. After surgical resection
c. After adjuvant radiotherapy
d. Suspected local recurrence
e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease

3. Surveillance:
   a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
   b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually

4. Suspicion of local recurrence

XV. Child abuse

XVI. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area (See MRI without and with contrast, CPT®73223)

XVII. Primary or metastatic bone tumor of the upper extremity – known or suspected\(^{20-22}\) – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]

A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
   1. Negative or does not explain the regional symptoms (MRI without contrast)
   2. Suspicious for osteoid osteoma clinically or radiographically (CT)
   3. Indeterminate for malignancy (MRI without and with contrast)
   4. Aggressive appearance on x-ray (MRI without and with contrast)
   5. Pathologic fracture; not definitely benign (MRI without and with contrast)
   6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
   7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
      a. Diagnosis uncertain based on x-ray appearance
      b. Imaging requested for preoperative planning

B. Osteosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging– every 2 cycles during chemotherapy and at the end of planned chemotherapy
5. Follow-up after treatment:
   a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
   b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
      i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
      ii. To clarify inconclusive findings on plain x-ray
      iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the shoulder with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the shoulder
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the shoulder with no pain

XVIII. Osteochondral defect or osteochondritis dissecans\textsuperscript{23, 24} [one of the following]
   A. Positive x-ray for osteochondral defect to stage for stability
   B. Catching, or stiffness or locking or instability with negative x-ray
   C. Chronic joint pain after trauma despite appropriate treatment and a negative x-ray
   D. Effusion or crepitus or tenderness with negative x-ray
   E. X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
   F. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays

XIX. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft-tissue tophi, when infection or neoplasm is in the differential diagnosis

XX. Paget's Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt

B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

References:

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73221 MRI Upper Extremity Joint without Gadolinium: Elbow

See Also: Shoulder, Wrist

I. Chronic joint pain (more than six months) with negative x-ray
   A. Incomplete resolution with conservative medical management [One of the following]
      1. Continued pain after treatment with anti-inflammatory medication and physical therapy for at least 4 weeks
      2. Symptoms worsening while under treatment

II. Suspected intra-articular loose body with recent x-ray (MRI without contrast if effusion is present; or MR arthrogram if no effusion is present) [One of the following]
   A. Joint pain
   B. Locking

III. Clicking Suspected or known avascular necrosis (osteonecrosis, AVN) with pain and recent x-ray which may be either negative or non-diagnostic or diagnostic of AVN but additional information is needed to determine management
   [(One risk factor and one selection from physical findings) or C or D]
   A. Risk factors and pain [One of the following]
      1. Steroid use
      2. Sickle cell disease
      3. Excessive alcohol use
      4. HIV infection
      5. SLE
      6. Renal transplant
      7. Trauma with fracture or dislocation
      8. Coagulopathy
      9. Bisphosphonate use
      10. Smoking
      11. Pancreatitis
      12. Gaucher’s disease
   B. Physical findings [One of the following]
      1. Catching
      2. Locking
      3. Clicking
      4. Grinding
      5. Crepitus
6. Stiffness  
7. Tenderness over the capitulum  
8. Flexion contractures  
C. Osteochondritis dessicans of the capitellum  
1. Pain localized to the lateral side of the elbow which is relieved by rest and not associated with night time symptoms  
2. Loss of motion  
3. Locking  
4. Catching  
5. Loss of extension of the elbow  
D. Clarification of findings on recent x-ray  

IV. Suspected fracture with negative x-ray\textsuperscript{1,4,5} [One of the following]  
A. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:  
1. Repeat x-rays remain non-diagnostic for fracture after minimum of 10 days of provider-directed conservative treatment  
2. Initial x-rays obtained a minimum of 14 days after the injury or onset of pain are non-diagnostic for fracture  
B. Child abuse  
C. Bone scan positive but not specific for fracture  
D. Osteoporosis on bone density or long term steroid use  
E. Stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study  

V. Injuries to the elbow with non diagnostic x-rays\textsuperscript{1,2,6-9}  
A. Ulna collateral ligament (medial) at the elbow with pain medially and negative x-rays  
1. Symptoms [One of the following]  
   a. Tenderness over the medial aspect of the elbow  
   b. Loss of range of motion  
   c. Bruising  
   d. Pain reproduced with a clenched fist  
   e. Valgus instability  
   f. Following acute or repetitive elbow trauma  
B. Radial collateral ligament injury at the elbow (lateral) with pain laterally [One of the following]  
1. Tenderness over the lateral aspect of the elbow  
2. Varus instability  
3. Positive chair rise test  
C. Ulnar nerve injury or entrapment with medial elbow pain [One of the following]  
1. Distal paresthesias of the forearm and 4th and 5th fingers  
2. History of throwing sports or racquet ball, tennis, weight lifting or skiing  
3. Positive Tinel’s sign over the medial epicondyle  
4. Atrophy of the hypothenar eminence  
5. Index finger pinch weakness
D. Biceps or triceps tendon tear with a negative x-ray [One of the following]  
   1. Swelling in the front of the elbow  
   2. Bruising near the elbow and in the forearm  
   3. Weakness of the biceps muscle on examination  
   4. Bulge in the upper arm  
   5. Defect in the muscle near the elbow

VI. Soft tissue mass including soft tissue sarcoma\textsuperscript{10-15} (MRI without and with contrast) [One of the following]  
Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.  
A. Nondiagnostic initial x-ray study  
B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration  
C. Soft tissue sarcoma of the extremity [One of the following]  
   1. Initial staging of primary site  
   2. Restaging:  
      a. After preoperative radiotherapy and preoperative planning prior to resection  
      b. After surgical resection  
      c. After adjuvant radiotherapy  
      d. Suspected local recurrence  
      e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease  
   3. Surveillance:  
      a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10  
      b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually  
   4. Suspicion of local recurrence

VII. Tendinitis, tendinopathy or tendinosis\textsuperscript{1,2,16} [One of the following]  
A. Lateral epicondylitis or tennis elbow (imaging is rarely required) with negative x-ray, pain along the lateral elbow which increases with activity and decreases with rest [Both of the following]  
   1. No improvement with at least 6 weeks of anti-inflammatory medication and home exercise program  
   2. No improvement with formal physical therapy program  
B. Medial epicondylitis or golfer’s elbow with pain on the medial side of the elbow and either decreased grip strength or pain with resisted flexion of the wrist, a negative x-ray and no improvement after at least 4 weeks of anti-inflammatory medication, activity modification or rest, ice and physical therapy  
C. Bicipital or biceps tendonitis near the elbow with incomplete resolution after conservative medical management consisting of treatment with anti-inflammatory medication and physical therapy for at least 4 weeks or findings worsening during trial of conservative management [One of the following]
1. Symptoms near the elbow with pain anterior to the elbow
   a. Weakness of the elbow on flexion
   b. Tenderness over the distal biceps tendon
2. Flexion contractures may be present in advanced disease (inability to fully extend the elbow)

D. Triceps tendinosis or tendinopathy with tenderness/pain over the triceps tendon posterior to the elbow, a negative x-ray and no improvement after anti-inflammatory medication and physical therapy for at least 4 weeks

E. Olecranon impingement with clicking or locking of the elbow at terminal extension with either a normal x-ray or one that shows osteophytes or loose bodies

VIII. Ulnar nerve entrapment with medial elbow pain\textsuperscript{16} [One of the following or more]
   A. Distal paresthesias of the forearm and 4th and 5th fingers
   B. History of throwing sports or racquetball, tennis, weight lifting or skiing
   C. Positive Tinel’s sign over the medial epicondyle
   D. Atrophy of the hypothenar eminence
   E. Index finger pinch weakness

IX. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area – See MRI without and with contrast, CPT code 73223

X. Child abuse

XI. Primary or metastatic bone tumor of the upper extremity – known or suspected\textsuperscript{17-19} – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
      6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
      7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
         a. Diagnosis uncertain based on x-ray appearance
         b. Imaging requested for preoperative planning
B. Osteosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging— every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental [One of the following]
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
E. Chordoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then
      annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray
      or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then
      annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray
      or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish new
      baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the elbow with known malignancy and non diagnostic bone
      scan
   2. Known bone metastases with pathologic fracture in the elbow
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and
      non diagnostic bone scan
   4. Positive bone scan in the elbow with no pain

XII. Osteochondral defect or osteochondritis dissecans\textsuperscript{20,21} [One
     of the following]
   A. Positive x-ray for osteochondral defect to stage for stability
   B. Catching, or stiffness or locking or instability with negative x-ray
   C. Chronic joint pain after trauma despite appropriate treatment and a negative
      x-ray
   D. Effusion or crepitus or tenderness with negative x-ray
   E. X-rays are negative and an osteochondral fracture is still suspected, or if x-
      ray and clinical exam suggest an unstable osteochondral injury, either MRI
      without contrast, MRI with contrast (arthrogram), or CT with contrast
      (arthrogram) of the area of interest is indicated
   F. MRI without contrast or CT without contrast is indicated when healing cannot
      be adequately assessed on follow-up x-rays
XIII. Ulnar Neuropathy\textsuperscript{22-24}
A. Initial EMG/NCV (electromyogram or nerve conduction velocity)
B. For pre-op only: MRI of the elbow without contrast (CPT\textsuperscript{®}73221) or MRI of the upper arm forearm without contrast (CPT\textsuperscript{®}73218)

XIV. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft-tissue tophi, when infection or neoplasm is in the differential diagnosis

XV. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10\% of cases, is suspected

References:
14. Von Mehren M, Randall RL, Benjamin RS, et al, National Comprehensive Cancer Network (NCCN) Guidelines Version 2.2014. Soft Tissue Sarcoma. \url{http://www.nccn.org/professionals/physician_gls/pdf/sarcoma.pdf}. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines\textsuperscript{™}) for Soft Tissue Sarcoma V2.2014. ©2014 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines\textsuperscript{™} and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines\textsuperscript{™}, go online to NCCN.org.

73221 MRI Upper Extremity Joint: Elbow
73221 MRI Upper Extremity Joint without Gadolinium: Wrist

See Also: Shoulder, Elbow

I. Chronic joint pain (6 months or more) etiology unknown with a negative x-ray\textsuperscript{1,2}
   A. No relief after conservative medical management [One of the following]
      1. Incomplete resolution with treatment with anti-inflammatory medication and physical therapy for at least 4 weeks
      2. Symptoms worsening while under treatment

II. Suspected intra-articular loose body [One of the following]
   A. Joint pain
   B. Locking
   C. Clicking

III. Suspected or known avascular necrosis (osteonecrosis, AVN, including Kienböck’s disease and Preiser's Disease) with pain and recent x-ray which may be either negative or non-diagnostic or diagnostic of AVN but additional information is needed to determine management\textsuperscript{1,3} [One risk factor and one selection from physical finding or clarification of findings on other imaging]
   A. Risk factors and pain [One of the following]
      1. Steroid use
      2. Sickle cell disease
      3. Excessive alcohol use
      4. HIV infection
      5. SLE
      6. Renal transplant
      7. Trauma [One of the following]
         a. Fracture
         b. Dislocation
      8. Coagulopathy
      9. Bisphosphonate use
     10. Smoking
     11. Pancreatitis
     12. Gaucher's disease
   B. Physical findings [One of the following]
     1. Catching
     2. Locking
     3. Clicking
4. Grinding
5. Crepitus
6. Stiffness
7. Tenderness
8. Flexion contractures

C. Clarification of findings on recent x-ray

IV. Suspected injury of wrist ligaments and cartilage including the triangular fibrocartilage complex (TFCC)\textsuperscript{3-8} with wrist pain and incomplete resolution with conservative medical management consisting of treatment with anti-inflammatory medication and physical therapy and immobilization for at least 4 weeks or findings worsening while in treatment
A. Physical findings [One of the following]
   1. Clicking
   2. Swelling
   3. Bruising
   4. Decreased grip strength
   5. Pain with movement
   6. Pain or tenderness on palpation

V. Suspected fracture with negative x-ray\textsuperscript{3,9,10} [One of the following]
A. Suspicion of fracture of distal radius
   1. Casting and negative x-ray 10-14 days after injury (There may be a negative x-ray at the time of injury)
B. Suspected acute fracture of the navicular or scaphoid with negative x-ray at time of injury
C. Suspected occult fracture of the scaphoid with a negative initial x-ray and pain or tenderness over the anatomic “snuff box” and no improvement after 10-14 days of casting and repeat x-ray at 10-14 days after injury
D. Comminuted, intra-articular fracture of the distal radius on x-ray for surgical planning
E. All other suspected, occult or insufficiency fractures of the hand and wrist (including the distal ulna, and radius, carpal bones, metacarpals and phalanges) with negative x-rays
   1. Repeat x-rays remain non-diagnostic for fracture after minimum of 10 (of provider-directed conservative treatment,
   2. Initial x-rays obtained a minimum of 14 days after the injury or onset of pain are non-diagnostic for fracture
F. Stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study.
G. Child abuse
VI. Evaluation of intrinsic muscles of the hand\textsuperscript{11} [One of the following]
   A. Atrophy of any hand muscles
   B. Motor and sensory deficits of the hand unexplained by PE and EMG

VII. Soft tissue mass including soft tissue sarcoma\textsuperscript{12-16} (MRI without and with contrast) [One of the following]
   Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
   A. Nondiagnostic initial x-ray study
   B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
   C. Soft tissue sarcoma of the extremity [One of the following]
      1. Initial staging of primary site
      2. Restaging:
         a. After preoperative radiotherapy and preoperative planning prior to resection
         b. After surgical resection
         c. After adjuvant radiotherapy
         d. Suspected local recurrence
         e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
      3. Surveillance:
         a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
         b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
      4. Suspicion of local recurrence

VIII. Child abuse

IX. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area – See MRI without and with contrast (CPT\textsuperscript{®} 73223)

X. Primary or metastatic bone tumor of the upper extremity – known or suspected\textsuperscript{17-19} – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
5. Pathologic fracture; not definitely benign (MRI without and with contrast)
6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence
D. Chondrosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the wrist and hand with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the wrist and hand
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the wrist and hand with no pain

XI. Osteochondral defect or osteochondritis dissecans [One of the following]
A. Positive x-ray for osteochondral defect to stage for stability  
B. Catching, or stiffness or locking or instability with negative x-ray  
C. Chronic joint pain after trauma despite appropriate treatment and a negative x-ray  
D. Effusion or crepitus or tenderness with negative x-ray  
E. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays

XII. Hand 22-23

XIII. Wrist
A. General Wrist Pain - following:
   1. X-Ray
   2. 6 weeks conservative treatment
B. Tendonitis – following:
   1. X-Ray
   2. 6 weeks conservative treatment

XIV. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft-tissue tophi, when infection or neoplasm is in the differential diagnosis

XV. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt  
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

References:


23. ACR Appropriateness Criteria, Musculoskeletal Imaging topics.


**73222** MRI Upper Extremity Joint with Gadolinium: Shoulder

**73223** MRI Upper Extremity Joint without and with Gadolinium: Shoulder

**See Also:** Elbow, Wrist

**I. Suspected or known osteomyelitis with bone pain**¹-⁶ [One of the following]

A. Clinical and laboratory findings [One of the following]
   1. Aural temperature >38.3°C or >100.9°F
   2. Leukocytosis, WBC >11,500/cu.mm
   3. Blood culture positive
   4. X-ray suggestive of osteomyelitis
   5. ESR >22 mm/hr
   6. C-reactive protein >10 mg/L

B. History of diabetes, dialysis or peripheral vascular disease

C. History of penetrating injury or surgery near the involved bone

D. Sinus tract, poor wound or fracture healing

E. Preoperative evaluation of known osteomyelitis

F. Positive probe to bone test

G. Post treatment evaluation

H. Suspicion of infected prosthesis (nuclear studies)

I. Chronic wound overlying surgical hardware

J. Chronic wound overlying a fracture

K. Exposed bone

**II. Arthritis and synovitis with either inadequate response to current treatment or to monitor response to treatment with known rheumatoid or gout or psoriatic arthritis or ankylosing spondylitis**¹¹-¹⁴

**III. Primary or metastatic bone tumor of the upper extremity – known or suspected**¹⁵-¹⁷ – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]

A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
   1. Negative or does not explain the regional symptoms (MRI without contrast)
   2. Suspicious for osteoid osteoma clinically or radiographically (CT)
3. Indeterminate for malignancy (MRI without and with contrast)
4. Aggressive appearance on x-ray (MRI without and with contrast)
5. Pathologic fracture; not definitely benign (MRI without and with contrast)
6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning.

B. Osteosarcoma of the upper extremity [One of the following]
1. Initial staging of primary site
2. After preoperative chemotherapy
3. At 6 weeks following local control surgery
4. Restaging - every 2 cycles during chemotherapy and at the end of planned chemotherapy
5. Follow-up after treatment:
   a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
   b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
      i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
      ii. To clarify inconclusive findings on plain x-ray
      iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
1. Initial staging of primary site
2. After preoperative chemotherapy
3. At 3 months following local control surgery
4. At the end of planned chemotherapy
5. Follow-up after treatment:
   a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
   b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
      i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
      ii. To clarify inconclusive findings on plain x-ray
      iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the upper extremity
1. Initial staging of primary site
2. Restaging after completion of radiotherapy
3. Every 2 cycles during chemotherapy
4. Surveillance - Low grade and intracompartmental
   a. Plain x-ray of primary site every 6 months for 2 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the shoulder with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the shoulder
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan of the shoulder with no pain
IV. Brachial plexus\textsuperscript{18,19} [One of the following]

A. Brachial plexus injury [Both of the following]
   1. Symptoms [One of the following]
      a. Weakness or paralysis of the upper extremity
      b. Sensory loss or numbness of the upper extremity
      c. Horner’s syndrome
      d. Shoulder and/or arm pain
      e. Burning or electric sensation in more than one nerve distribution
      f. Loss of deep tendon reflexes in the upper extremity
      g. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels

   2. History [One of the following]
      a. Trauma including birth trauma motor vehicle accident, falls, sports injuries, gun shot injury, overuse of back packs
      b. Radiation fibrosis
      c. History of radiation therapy to the chest, breast, or axilla

B. Primary or metastatic tumor [Both of the following]
   1. Symptoms [One of the following]
      a. Weakness or paralysis of the upper extremity
      b. Sensory loss or numbness of the upper extremity
      c. Horner’s syndrome
      d. Shoulder and/or arm pain
      e. Burning or electric sensation in more than one nerve distribution
      f. Loss of deep tendon reflexes in the upper extremity
      g. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels

   2. History [One of the following]
      a. Known primary tumor
      b. Lung cancer especially a Pancoast tumor
      c. Lymphoma

C. Schwannoma or neurofibroma
   1. Symptoms [One of the following]
      a. Palpable mass in the lower neck or supraclavicular fossa
      b. Weakness or paralysis of the upper extremity
      c. Sensory loss or numbness in the upper extremity
      d. Horner’s syndrome
      e. Shoulder and/or arm pain
      f. Burning or electric sensation in more than one nerve distribution
      g. Loss of deep tendon reflexes in the upper extremity
      h. EMG showing a neurogenic lesion in muscles supplied by at least 2 cervical levels

D. Entrapment
   1. Symptoms [One of the following]
      a. Pain and paresthesia along the ulna aspect of the forearm, hand and 4th and 5th fingers
      b. Symptoms increase with overhead activities
V. Shoulder Rotator Cuff Tear (Complete and Partial)
   A. Following x-ray and 6 weeks of conservative treatment MRI shoulder without contrast (CPT® 73221) or MRI shoulder with contrast (arthrogram) (CPT® 73222). CT shoulder with contrast (CPT® 73201) if MRI is contraindicated
   B. Conservative treatment is not required with an acute shoulder injury prior to the onset of symptoms and consideration of surgery.

VI. Impingement - X-ray and 6 weeks of conservative treatment - MRI shoulder without contrast (CPT® 73221) or MRI shoulder with contrast (arthrogram) (CPT® 73222). CT shoulder with contrast (CPT® 73201) if MRI is contraindicated

VII. MRI shoulder with contrast (arthrogram) for suspected labral tear or SLAP lesion or Bankart lesion and x-rays are non contributory\(^7-10\) [One of the following]
   A. Suspect labral tear with or without instability [One of the following]
      1. Pain interferes with the smooth functioning of the shoulder
      2. Discomfort on forced external rotation at 90 degrees of abduction
      3. A “pop” or “click” on forced external rotation
      4. Discomfort on forced horizontal adduction of the shoulder
      5. Weakness in the rotator cuff muscles on examination
      6. Decreased range of motion
      7. Pain with overhead activity
      8. Prior rotator cuff repair and recurrent symptoms

VIII. Post-Operative Shoulder Surgery for Impingement, Rotator Cuff Tear, and/or Labral Tear following x-ray and 6 weeks conservative treatment - MRI shoulder without contrast (CPT® 73221) or MRI shoulder with contrast (arthrogram) (CPT® 73222) in symptomatic individuals

IX. MRI arthrogram or CT arthrogram is appropriate when joint sparing/salvage reconstructive surgery is planned for the following:
   A. Suspected concomitant rotator cuff tear of the shoulder
   B. Suspected concomitant labral tear of the shoulder

X. Soft tissue mass including soft tissue sarcoma\(^20-24\) (MRI without and with contrast) [One of the following]
   A. Nondiagnostic initial x-ray study
   B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
   C. Soft tissue sarcoma of the extremity [One of the following]
      1. Initial staging of primary site
      2. Restaging:
a. After preoperative radiotherapy and preoperative planning prior to resection
b. After surgical resection
c. After adjuvant radiotherapy
d. Suspected local recurrence
e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease

3. Surveillance
   a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
   b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually

4. Suspicion of local recurrence

XI. Septic joint with arthrocentesis contraindicated or not diagnostic [All of the following] (Ultrasound or x-ray guided arthrocentesis is the procedure of choice)\textsuperscript{7,25}
   A. Symptoms [One of the following]
      1. Decreased range of motion
      2. Acute development of a hot swollen joint (<2 weeks)
   B. Laboratory tests [One of the following]
      1. Aural temperature >38.3°C or >100.9°F
      2. Leukocytosis, WBC >11,500/cu.mm
      3. ESR >22 mm/hr
      4. CRP >10 mg/L

XII. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]
   A. Aural temperature >38.3°C or >100.9°F
   B. Leukocytosis, WBC >11,500/cu.mm
   C. ESR >22 mm/hr
   D. CRP >10 mg/L

XIII. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest can be approved after plain X-rays rule out the presence of radiopaque foreign bodies

XIV. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft-tissue tophi, when infection or neoplasm is in the differential diagnosis
XV. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures
- X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated

XVI. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on plain X-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

References:

http://www.nccn.org/professionals/physician_gls/pdf/bone.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Bone Cancer V1.2014. ©2014 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.


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73222, 73223 MRI Upper Extremity Joint: Shoulder
73222  MRI Upper Extremity Joint with Gadolinium: Elbow
73223  MRI Upper Extremity Joint without and with Gadolinium: Elbow

See Also: Shoulder, Wrist

I. Suspected or known osteomyelitis with bone pain[^1-^8] [One of the following]
   A. Clinical and laboratory findings [One of the following]
      1. Aural temperature >38.3°C or >100.9°F
      2. Leukocytosis, WBC >11,500/cu.mm
      3. Blood culture positive
      4. X-ray suggestive of osteomyelitis
      5. ESR >22mm/hr
      6. C-reactive protein >10 mg/L
   B. History of diabetes, dialysis or peripheral vascular disease
   C. History of penetrating injury or surgery near the involved bone
   D. Sinus tract, poor wound or fracture healing
   E. Preoperative evaluation of osteomyelitis
   F. Positive probe to bone test
   G. Post treatment evaluation
   H. Suspicion of infected prosthesis (nuclear studies)
   I. Chronic wound overlying surgical hardware
   J. Chronic wound overlying a fracture
   K. Exposed bone

II. Arthritis and synovitis with either inadequate response to current treatment or to monitor response to treatment with known rheumatoid or gout or psoriatic arthritis or ankylosing spondylitis[^9-^12]

III. Primary or metastatic bone tumor of the upper extremity – known or suspected[^13-^15] – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)

[^1-^8]:

[^9-^12]:

[^13-^15]:
4. Aggressive appearance on x-ray (MRI without and with contrast)
5. Pathologic fracture; not definitely benign (MRI without and with contrast)
6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning.

B. Osteosarcoma of the **upper extremity** [One of the following]
1. Initial staging of primary site
2. After preoperative chemotherapy
3. At 6 weeks following local control surgery
4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
5. Follow up after treatment:
   a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
   b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
      i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
      ii. To clarify inconclusive findings on plain x-ray
      iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the **upper extremity** [One of the following]
1. Initial staging of primary site
2. After preoperative chemotherapy
3. At 3 months following local control surgery
4. At the end of planned chemotherapy
5. Follow up after treatment:
   a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
   b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
      i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
      ii. To clarify inconclusive findings on plain x-ray
      iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the **upper extremity** [One of the following]
1. Initial staging of primary site
2. Restaging after completion of radiotherapy
3. Every 2 cycles during chemotherapy
4. Surveillance - Low grade and intracompartmental
   a. Plain x-ray of primary site every 6 months for 2 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the elbow with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the elbow
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the elbow with no pain

IV. MR arthrogram\textsuperscript{16} [All of the following]
   A. Pain interferes with the smooth functioning of the elbow
   B. Non diagnostic x-rays
V. Soft tissue mass including soft tissue sarcoma\textsuperscript{17-22} (MRI without and with contrast) [One of the following]

Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.

A. Nondiagnostic initial x-ray study

B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration

C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
      a. After preoperative radiotherapy and preoperative planning prior to resection
      b. After surgical resection
      c. After adjuvant radiotherapy
      d. Suspected local recurrence
      e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
   3. Surveillance:
      a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
      b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
   4. Suspicion of local recurrence

VI. Septic joint with arthrocentesis contraindicated or not diagnostic [All of the following] (Ultrasound or x-ray guided arthrocentesis is the procedure of choice)\textsuperscript{23}

A. Symptoms [One of the following]
   1. Decreased range of motion
   2. Acute development of a hot swollen joint (<2 weeks)

B. Laboratory tests [One of the following]
   1. Aural temperature >38.3°C or >100.9°F
   2. Leukocytosis, WBC >11,500/cu mm
   3. ESR>22mm/hr
   4. CRP >10 mg/L

VII. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]

A. Aural temperature >38.3°C or >100.9°F
B. Leukocytosis, WBC >11,500/cu mm
C. ESR>22mm/hr
D. CRP >10 mg/L

VIII. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest can be approved after x-rays rule out the presence of radiopaque foreign bodies
IX. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft-tissue tophi, when infection or neoplasm is in the differential diagnosis

X. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

XI. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures - X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated

XII. Symptomatic Loose Bodies - MRI elbow without contrast (CPT® 73221) if effusion is present; or MRI elbow with contrast (arthrogram) (CPT® 73222) if no effusion is present

XIII. Ulnar Collateral Ligament (UCL) Tear – MRI Elbow with contrast (arthrogram) (CPT® 73222) or MRI Elbow without contrast (CPT® 73221) after x-ray following acute or repetitive elbow trauma

References:

73222 MRI Upper Extremity Joint with Gadolinium: Wrist
73223 MRI Upper Extremity Joint with and without Gadolinium: Wrist

See Also: Shoulder, Elbow

I. Suspected or known osteomyelitis with bone pain1-8 [One of the following]
   A. Clinical and laboratory findings [One of the following]
      1. Aural temperature >38.3°C or >100.9°F
      2. Leukocytosis, WBC >11,500/cu.mm
      3. Blood culture positive
      4. X-ray suggestive of osteomyelitis
      5. ESR >22 mm/hr
      6. C-reactive protein >10 mg/L
   B. History of diabetes, dialysis or peripheral vascular disease
   C. History of penetrating injury or surgery near the involved bone
   D. Sinus tract, poor wound or fracture healing
   E. Preoperative evaluation of osteomyelitis
   F. Positive probe to bone test
   G. Post treatment evaluation
   H. Suspicion of infected prosthesis (nuclear studies)
   I. Chronic wound overlying surgical hardware
   J. Chronic wound overlying a fracture
   K. Exposed bone

II. Arthritis and synovitis with either inadequate response to current treatment or to monitor response to treatment with known rheumatoid or gout or psoriatic arthritis or ankylosing spondylitis9-12

III. Primary or metastatic bone tumor of the upper extremity – known or suspected13-15 – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following and suspected (not known) bone tumor]
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
5. Pathologic fracture; not definitely benign (MRI without and with contrast)
6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Every Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
4. Surveillance - Low grade and intracompartmental
   a. Plain x-ray of primary site every 6 months for 2 years, annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the upper extremity (MRI) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the upper extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the wrist and hand with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the wrist and hand
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the wrist and hand with no pain

IV. MR arthrogram with a history of injury and pain in the wrist and a recent x-ray that does not explain the symptoms\textsuperscript{16-18} [One of the following]
A. Suspected or known **TFCC** ligament injury with pain and incomplete resolution with conservative medical management consisting of treatment with anti-inflammatory medication and physical therapy and immobilization for at least 4 weeks or findings worsening while in treatment [One of the following]
   1. Clicking during wrist movements
   2. Decreased grip strength
   3. Pain or tenderness over the TFCC with palpation
   4. Positive ulnar carpal sag test
B. Suspicion of **scapholunate ligament** disruption
C. Suspicion of ** lunotriquetral ligament** disruption
D. Loose body

V. **Soft tissue mass including soft tissue sarcoma**\(^{19-23}\) (MRI without and with contrast) [One of the following]
   Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
   A. Nondiagnostic initial x-ray
   B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
   C. Soft tissue sarcoma of the extremity [One of the following]
      1. Initial staging of primary site
      2. Restaging:
         a. After preoperative radiotherapy and preoperative planning prior to resection
         b. After surgical resection
         c. After adjuvant radiotherapy
         d. Suspected local recurrence
         e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
      3. Surveillance:
         a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
         b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
      4. Suspicion of local recurrence

VI. **Septic joint** [All of the following] (Ultrasound or x-ray guided arthrocentesis is the procedure of choice)\(^ {24}\) [One of the following]
   A. Arthrocentesis contra-indicated or not diagnostic
   B. Symptoms [One of the following]
      1. Decreased range of motion
      2. Acute development of a hot swollen joint (<2 weeks)
   C. Laboratory tests [One of the following]
      1. Aural temperature >38.3°C or >100.9°F
      2. Leukocytosis, WBC >11,500/cu.mm
3. ESR >22 mm/hr
4. CRP >10 mg/L

VII. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]
A. Aural temperature >38.3°C or >100.9°F
B. Leukocytosis, WBC >11,500/cu.mm
C. ESR >22 mm/hr
D. CRP >10 mg/L

VIII. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest can be approved after x-rays rule out the presence of radiopaque foreign bodies

IX. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft-tissue tophi, when infection or neoplasm is in the differential diagnosis

X. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

XI. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures - X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated

References:

73222, 73223 MRI Upper Extremity Joint: Wrist
73225 MRA of the Upper Extremity

I. Suspected occlusion, stenosis\(^1\) [One of the following]
   A. Abnormal pulses: asymmetric, weak or absent
   B. Skin changes: poor capillary filling, cyanosis
   C. Abnormal Doppler ultrasound
   D. Reconstruction surgery planning
   E. Thoracic outlet syndrome [One of the following]
      1. Cold extremity or digits
      2. Pallor
      3. Decreased pulses
      4. Decreased blood pressure in one arm
      5. Change in pulse or blood pressure with change in position of arm or head
         (positive Adson’s maneuver or Allen test)
   F. Effort thrombosis
      1. Swelling of the upper extremity, face or neck
      2. Cyanosis of the upper extremity, face or neck
      3. Evidence of collateral veins
   G. Arteritis (Takayasu’s arteritis, giant cell arteritis) [One of the following]
      1. ESR >22mm/hr
      2. Positive ANA
      3. Positive RF or rheumatoid factor
   H. Scleroderma
   I. Hypercoagulable state [One of the following]
      1. Antiphospholipid antibodies
      2. Behçet’s syndrome
      3. Protein C deficiency
      4. Protein S deficiency
      5. Factor V Leiden deficiency
      6. Lupus anticoagulant
      7. Hyperactive platelet syndrome
      8. MRHFR
      9. Anti-cardiolipin antibodies
      10. Elevated homocysteine level
      11. Anti B2 glycoprotein antibodies
      12. Elevated fibrinogen
      13. PTT abnormal
      14. Antithrombin III antibodies
      15. Oral contraceptive use
      16. Hormone replacement
      17. Sickle cell anemia
   J. Buerger’s disease (thromboangiitis obliterans) [Both of the following]
      1. History of smoking
      2. Loss of pulses or decreased pulses in the upper extremity
II. **Aneurysm**
   A. Pulsatile mass by palpation or imaging

III. **Venous aneurysm with negative ultrasound**
   A. Asymptomatic peripheral mass

IV. **Arteriovenous malformation or venous malformation**
    [One of the following]
    A. Hypertrophy of soft tissues of the extremity
    B. Limb length discrepancy
    C. History of Klippel-Trenaunay syndrome of variant
    D. History of Osler-Weber-Rendu syndrome
    E. History of Parkes-Weber syndrome
    F. Hemorrhage into a limb
    G. Reddish pulsatile mass [One of the following]
        1. Thrill
        2. Bruit
    H. Port-wine stain
    I. Dilated veins
    J. Congenital lipomatous overgrowth
    K. Vascular malformations
    L. Epidermal nevi
    M. Scoliosis/skeletal/spinal anomalies (CLOVES) syndrome
    N. Capillary malformations also known as port wine stains are characterized by a collection of small vascular channels in the dermis and generally do not require imaging because the diagnosis is made clinically. However, MR imaging may be required to evaluate an occult underlying neurologic structures, since these malformations are associated with encephalocele, spinal dysraphism, or Sturge-Weber syndrome

V. **Upper extremity venous thrombosis**
   A. Duplex venous ultrasound including compression is equivocal

References:

73225 MRA of the Upper Extremity
I. Suspected nonunion of known fracture – Fracture should be at least 9 months old and show no radiographic progression of healing for 3 months

II. Suspected tarsal coalition with negative or non-diagnostic x-ray and pain which is relieved by rest
A. Painful rigid flatfoot

III. Primary or metastatic bone tumor of the lower extremity – known or suspected – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
   1. Negative or does not explain the regional symptoms (MRI without contrast)
   2. Suspicious for osteoid osteoma clinically or radiographically (CT)
   3. Indeterminate for malignancy (MRI without and with contrast)
   4. Aggressive appearance on x-ray (MRI without and with contrast)
   5. Pathologic fracture; not definitely benign (MRI without and with contrast)
   6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
   7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
      a. Diagnosis uncertain based on x-ray appearance.
      b. Imaging requested for preoperative planning
B. Osteosarcoma of the lower extremity [One of the following] (MRI)
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow up after treatment:
a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
   i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
   ii. To clarify inconclusive findings on plain x-ray
   iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the lower extremity [One of the following] (MRI)
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the lower extremity (MRI) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartamental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the lower extremity (MRI) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the lower extremity (MRI) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

IV. Soft tissue mass including soft tissue sarcoma\(^{5-8}\) (MRI without and with contrast) [One of the following]

Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.

A. Nondiagnostic initial x-ray study

B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration

C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
      a. After preoperative radiotherapy and preoperative planning prior to resection
      b. After surgical resection
      c. After adjuvant radiotherapy
      d. Suspected local recurrence
      e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
   3. Surveillance:
      a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
      b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
   4. Suspicion of local recurrence

V. Complex fracture, CT required for therapy planning
VI. Patellofemoral pathology or runner’s knee (including patellar tracking disorder) with either negative x-ray or x-ray demonstrating an effusion, degenerative arthritis, or chondrocalcinosis and no improvement with conservative management consisting of physical therapy for at least 6 weeks\textsuperscript{10,11} (MRI without contrast) [Both of the following]
This is usually a clinical diagnosis that does not require imaging. X-rays may be required. CT or MRI is rarely necessary.
A. Symptoms and history [One of the following]
   1. Anterior knee pain worsening with activity (e.g., running, standing up from a bent-knee position)
   2. Pain on squatting
   3. History of recurrent patellar dislocations or subluxations
B. Clinical findings [One of the following]
   1. Crepitus
   2. Positive patellar grind test
   3. Pain on palpation of the medial and/or lateral patellar
   4. Positive J sign (patella displaces laterally at full knee extension)
   5. Positive patellar tilt test

VII. Suspected avascular necrosis (osteonecrosis)\textsuperscript{12-14} and MRI is contraindicated and bone scan cannot be performed or is not planned (MRI) [Risk factor and symptoms]
A. Risk factor and pain [One of the following]
   1. Excessive alcohol use
   2. HIV infection
   3. SLE
   4. History of steroid use
   5. Sickle cell disease
   6. Renal transplant
   7. Trauma [One of the following]
      a. Fracture
      b. Dislocation
   8. Bisphosphonate use
   9. Coagulopathy
   10. Smoking
   11. Pancreatitis
   12. Gaucher’s disease
B. Hip with recent x-ray
   1. Radiography with a collapsed femoral head
   2. Hip pain with normal x-ray and a risk factor in A
   3. Stress fracture of the femoral neck
   4. Pain in the groin or buttocks
   5. Pain increasing with activity
   6. Pain with internal rotation
   7. Limited range of motion
C. Knee
   1. Positive x-ray with need for additional characterization of the lesion prior to intervention or non diagnostic x-ray [One of the following]
      a. Pain and/or swelling
      b. Catching or locking or giving way

D. Ankle [Both of the following] (CT arthrogram)
   1. Non-diagnostic x-ray
   2. Pain [One of the following]
      a. Swelling
      b. Stiffness
      c. Weakness
      d. Symptoms exacerbated by prolonged standing
      e. Joint effusion
      f. Instability
      g. Giving way
      h. Catching
      i. Grinding

VIII. Preoperative Hip Replacement Surgery
     Surgery following x-ray and 6 weeks conservative treatment for preoperative planning prior to hip replacement when congenital or posttraumatic deformities exist

IX. Post-Operative Joint Replacement Surgery
A. CT without contrast or bone scan (CPT®78315 or CPT®78320) may be indicated for the evaluation of suspected aseptic loosening of orthopaedic joint replacements when recent x-ray is nondiagnostic
B. CT without contrast is appropriate with a high suspicion for a periprosthetic fracture and a negative x-ray
C. CT hip without contrast (CPT®73700) to evaluate component malposition or heterotopic bone after x-ray
D. CT hip without contrast (CPT®73700) or MRI hip without contrast (CPT®73721) is appropriate to evaluate suspected particle disease (aggressive granulomatous disease) of the hip when infection has been excluded
E. CT knee without contrast (CPT®73700) or MRI knee without contrast (CPT®73721) for suspected osteolysis or component instability, rotation, or wear;
F. In-111 WBC (CPT®78805) and Tc-99m sulfur colloid scan hip (CPT®78102 or CPT®78103) for suspected infection with negative or inconclusive joint aspiration culture

X. **Hip pain** [One of the following]
A. Gait abnormality
B. Impaired range of motion
C. Locking or snapping
XI. Ankle impingement syndrome\textsuperscript{16} (MR arthrogram; if CT is performed it should be CT arthrogram)

XII. Lisfranc injury or fracture and MRI cannot be done and x-rays are normal or indeterminate\textsuperscript{17} (MRI) [One of the following]
A. Acute injury of the foot
B. Pain, swelling and inability to bear weight

XIII. Femoroacetabular impingement syndrome or hip impingement and an x-ray\textsuperscript{18-20} [One of the following]
A. Symptoms [One of the following]
   1. Pain with prolonged sitting
   2. Difficulty getting in and out of a car
   3. Pain reproduced by flexion or adduction or internal rotation of the hip when supine.
   4. Complaints of anterolateral hip pain
   5. Positive FADIR test (flexion-adduction-internal rotation)
B. Radiographic findings suggestive of impingement such as cam lesion or pincer lesion

XIV. Subtalar dislocation\textsuperscript{21}

XV. CT arthrogram with x-rays showing a Segond fracture\textsuperscript{14}

XVI. Tibial plateau fracture on x-ray\textsuperscript{22,23} [One of the following]
A. Focal tenderness
B. Effusion
C. Inability to bear weight

XVII. MRI or CT without contrast can be performed for suspected occult/stress/insufficiency fractures when either:
A. Repeat x-rays remain non-diagnostic for fracture after a minimum of 10 days of provider-directed conservative treatment
B. Initial x-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture

XVIII. CT without contrast can be performed as an alternative to MRI for suspected insufficiency fractures of the pelvis/hip and suspected atypical femoral shaft fractures related to bisphosphonate

XIX. MRI arthrogram or CT arthrogram is appropriate when joint sparing/salvage reconstructive surgery is planned for the following:
A. Suspected concomitant labral tear of the hip
B. Suspected concomitant internal derangement of the knee
XX. **Hip - Labral Tear** – following x-ray - MRI hip with contrast (arthrogram) (CPT®73722) or CT hip with contrast (arthrogram) (CPT®73701)

XXI. **Knee – Symptomatic Loose Bodies** following x-ray MRI knee without contrast (CPT®73721) or CT knee with contrast (arthrogram) (CPT®73701) if MRI cannot be performed

XXII. **Growth Plate Injuries (Salter-Harris Fractures)** following x-ray in case of severe injury with displacement of bone fractures, CT may be indicated prior to surgical intervention

XXIII. **Osteochondral defect or osteochondritis dissecans** [One of the following]
A. Positive x-ray for osteochondral defect to stage for stability
B. Catching, or stiffness or locking or instability with negative x-ray
C. Chronic joint pain after trauma despite appropriate treatment and a negative x-ray
D. Effusion or crepitus or tenderness with negative x-ray
E. X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
F. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays.

XXIV. **Foreign Body** - CT without contrast or MRI without and with contrast of the area of interest can be approved after x-rays rule out the presence of radiopaque foreign bodies.

XXV. **Gout** - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis

XXVI. **Septic Joint**
A. Analysis of joint fluid is most often sufficient to diagnose a septic joint. An MRI of the joint, without/ and with contrast is appropriate when standard or image-guided arthrocentesis is contraindicated, unsuccessful, or non-diagnostic, and the clinical documentation satisfies ALL of the following criteria:
   1. History and physical examination findings [One of the following]:
      a. Development of an acutely hot and swollen joint (< 2 weeks)
      b. Decreased range of motion due to pain
      c. Documented fever
   2. Laboratory tests [One of the following]:
      a. Leukocytosis
      b. Elevated ESR or C-reactive protein
c. Analysis of the joint fluid is non-diagnostic

3. X-ray of the joint

B. MRI without and with contrast is appropriate after x-rays if the arthrocentesis is diagnostic and if there is a confirmed septic joint, to evaluate the extent of infection into the soft tissues and any skip lesions that would require evaluation.

C. CT with contrast can replace MRI without and with contrast if MRI is contraindicated

References:


73700, 73701, 73702 CT of the Lower Extremity
73706  CTA of the Lower Extremity

For aortobifemoral or aortobiiliac runoff study use CPT code 75635.

I. Peripheral vascular disease with abnormal ankle brachial index as defined in A [AND one additional of the following] after failure of a minimum of 3 months of a physician directed walking exercise program¹-⁴
   A. Note: For evaluation of PVD, if meets criteria for MRA abdomen, MRA lower extremity (one only) should be certified. An MRA of the pelvis or another lower extremity should NOT be certified. ABI (ankle brachial index, ankle systolic BP divided by brachial systolic BP)
      1. Rest ABI <0.90 in symptomatic member
      2. Exercise ABI <0.90 in symptomatic member with rest ABI >0.90
      3. Toe brachial index <0.90 or pulse volume recording evidence of peripheral vascular disease if the ABI >1.30
   B. Abnormal pulses
   C. Bruit
   D. Claudication

II. Peripheral arterial vascular disease with abnormal ankle brachial index as defined above in A [AND one additional of the following]
   A. Arteritis (Takayasu’s arteritis, giant cell arteritis) [One of the following]
      1. ESR >22mm/hr
      2. Positive ANA
      3. Positive RF or rheumatoid factor
   B. Scleroderma
   C. Hypercoagulable state [One of the following]
      1. Antiphospholipid antibodies
      2. Behçet’s syndrome
      3. Protein C deficiency
      4. Protein S deficiency
      5. Factor V Leiden deficiency
      6. Lupus anticoagulant
      7. Hyperactive platelet syndrome
      8. MRHFR
      9. Anticardiolipin antibodies
      10. Elevated homocysteine level
      11. Anti B2 glycoprotein antibodies
      12. Elevated fibrinogen
      13. PTT abnormal
      14. Antithrombin III antibodies
      15. Oral contraceptive use
      16. Hormone replacement
17. Sickle cell anemia
D. Buerger's disease (thromboangiitis obliterans) [Both]
   1. History of smoking
   2. Loss of pulses or decreased pulses in the lower extremity
E. Known atherosclerotic occlusive disease when catheter angiography fails to
demonstrate an occult runoff vessel suitable for vascular bypass

III. Femoral or popliteal artery aneurysm¹
A. Pulsatile mass
B. CTA (CPT®73706) or MRA (CPT®73725) performed for:
   1. Preoperative study for patients with no plans for invasive angiography
   2. Technically limited or abnormal ultrasound results

IV. Trauma (popliteal)¹
A. Diminished peripheral pulses
B. Suspected pseudoaneurysm

V. Fibular transfer graft⁵,⁶

VI. Venous aneurysm [One of the following]
A. Doppler US not diagnostic
B. Asymptomatic peripheral mass

VII. Arteriovenous malformation

VIII. Venous malformation

IX. Deep venous thrombosis
A. Equivocal duplex venous ultrasound including compression

References:
   inflow and runoff: initial experience, Radiology, 2001; 221:146-158.
2. Rooke TW, Hirsch AT, Misra S, et al. 2011 ACC/AHA update of the guideline for the management of
   patients with peripheral arterial disease (updating the 2005 guideline).

73706 CTA of the Lower Extremity
73718  MRI of the Lower Extremity Other than Joints without Contrast

I. Suspected fracture (including stress and occult fractures) with pain and a negative or non-diagnostic x-ray \(^1\text{-}^3\) [One of the following]
   A. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:
      1. Repeat x-rays remain non-diagnostic for fracture after a minimum of 10 days of provider-directed conservative treatment
      2. Initial x-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture
   B. Bone scan positive but not specific for fracture
   C. Osteoporosis on bone density or long term steroid use with sacral pain (insufficiency fracture of the sacrum) [Both of the following]
      1. Negative x-ray
      2. Negative bone scan
   D. Stress or insufficiency fracture of the hip
      1. Normal x-ray
   E. For suspected shin splints, MRI of the lower leg without contrast (CPT\(^\text{®}\)73718) is appropriate after x-ray and failure of a 6-week trial of provider-directed conservative treatment
   F. For stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study.

II. Suspected soft tissue injury \(^4\text{-}^9\) with negative or non-diagnostic x-rays [One of the following]
   A. Anterior cruciate ligament injury or tear [One of the following]
      1. Rapid onset of an effusion which may be bloody
      2. Instability of the knee
      3. Positive anterior drawer sign
      4. Positive Lachman’s sign
      5. Positive pivot shift test
   B. Posterior cruciate ligament injury or tear with incomplete resolution after a trial of immobilization and physical therapy for at least 4 weeks [One of the following]
      1. Absent tibial step off (tibia should protrude 1 cm beyond femur at 90 degrees of flexion) or positive posterior tibial sag sign (Godfrey test)
      2. Positive posterior drawer sign
      3. Rapid onset of swelling
      4. Positive reverse pivot shift test
   C. Quadriceps tendon tear or rupture with negative or non-diagnostic x-ray [One of the following]
1. Acute knee pain and swelling
2. Difficulty ambulating
3. Bruising
4. Palpable defect in the suprapatellar area
5. Low lying patella
6. Limited extension

D. Hamstring muscle injury
1. Sudden pain in the back of the thigh
2. Swelling
3. Bruising
4. Weakness

E. Achilles tendon tear or rupture with negative or non-diagnostic x-ray and an equivocal ultrasound [Both of the following]
1. Symptoms [One of the following]
   a. Posterior heel pain proximal to tendon insertion
   b. Thickening of the tendon
   c. Nodularity of the tendon
   d. Tendonerness
   e. Stiffness on weight bearing after prolonged immobility
2. Findings on examination [One of the following]
   a. Decreased plantar flexor strength
   b. Limited ability to perform repetitive heel raises
   c. Positive arc sign
   d. Positive Thompson test or Simmonds squeeze test
   e. Palpable gap in the tendon

F. Peroneal tendon syndromes and incomplete resolution with NSAIDS (if not contraindicated) for at least 4 weeks and a non-diagnostic x-ray (Only one MRI is required to image the entire peroneal tendon) [One of the following]
1. Tendinitis [One of the following]
   a. Pain and swelling behind and distal to the lateral malleolus
   b. Ankle pain with active eversion and dorsiflexion against resistance
2. Peroneal tendon subluxation [One of the following]
   a. Snapping along the lateral ankle
   b. Pain along the lateral ankle
   c. Pain with toe walking
   d. Pain and swelling over the posterior lateral ankle
3. Peroneal tendon tear [One of the following]
   a. Acute injury with pain and swelling inferior and posterior to lateral malleolus
   b. Chronic injury increasing pain inferior and posterior to the lateral malleolus
4. Ankle sprains with incomplete resolution after conservative management for at least 4 weeks with NSAIDS (if not contraindicated)
   a. Physical examination [One of the following]
      i. Swelling and/or bruising
      ii. Tendonerness
iii. Difficulty bearing weight

G. Muscle injury
   1. Defect palpable
   2. Pain on movement with palpable muscle swelling

III. Achilles tendinopathy or tendonitis with incomplete resolution after 6 months of conservative management to consist of anti-inflammatory medication usually NSAIDS\textsuperscript{6,7} [One of the following]
   A. Pain or tenderness proximal to the insertion to the calcaneus
   B. Crepitation

IV. Patella tendinopathy [Both of the following]
   A. Symptoms [One of the following]
      1. Pain during activity
      2. Swelling
      3. Thickening of the tendon
      4. Crepitus
      5. Tenderness
   B. Incomplete resolution with at least 3 months of conservative therapy [All of the following]
      1. Activity modification for at least 3 months
      2. Ice
      3. NSAIDS for at least 3 months

V. Suspected tarsal coalition\textsuperscript{10,11} with pain relieved by rest and non-diagnostic CT scan [One of the following]
   A. Painful rigid flatfoot

VI. Plantar fasciitis\textsuperscript{10,12-14} with pain and incomplete resolution after conservative management for at least 6 weeks consisting of stretching exercises, activity modification and NSAIDS or other anti-inflammatory medications unless contraindicated and negative weight bearing x-rays of the foot and heel [One of the following]
   A. Pain on initiation of walking especially along the medial side of the heel
   B. Increasing heel pain with prolonged weight bearing
   C. Morning heel pain
   D. Pronated foot
   E. Localized swelling or atrophy of the infracalcaneal heel pad
   F. Known rheumatoid arthritis, gout, SLE or seronegative spondyloarthropathies

VII. Ostrigonum syndrome with incomplete resolution after a combination of physical therapy and steroid injections\textsuperscript{15-17} [All of the following]
   A. X-ray of the ankle that is negative
   B. Symptoms
1. Pain posterior ankle which may be exacerbated by plantar or dorsiflexion
2. Swelling posterior ankle

C. Clinical examination
1. Tenderness anterior to the Achilles tendon and posterior to the talus
2. May have a palpable soft tissue thickening

D. Conservative therapy [Both of the following]
1. Failure to respond to physical therapy
2. Failure to respond to steroid injections

VIII. Arteriovenous malformation or venous malformation\textsuperscript{18-21} [One of the following]
A. Hypertrophy of soft tissues of the extremity
B. Limb length discrepancy
C. History of Klippel-Trenaunay syndrome of variant
D. History of Osler-Weber-Rendu syndrome
E. History of Parkes Weber syndrome
F. Hemorrhage into a limb
G. Reddish pulsatile mass [One of the following]
   1. Thrill
   2. Bruit
H. Port-wine stain
I. Dilated veins
   1. Must have negative duplex Doppler evaluation for venous insufficiency
J. Congenital lipomatous overgrowth
K. Vascular malformations
L. Epidermal nevi
M. Scoliosis/skeletal/spinal anomalies (CLOVES) syndrome
N. Capillary malformations also known as port wine stains are characterized by a collection of small vascular channels in the dermis and generally do not require imaging because the diagnosis is made clinically. However, MR imaging may be required to evaluate an occult underlying neurologic structures, since these malformations are associated with encephalocele, spinal dysraphism, or Sturge-Weber syndrome

IX. Morton’s neuroma with non-diagnostic ultrasound and incomplete resolution with conservative management consisting of shoe modification or orthotics, anti-inflammatory medication or local injection of steroids and/or local anesthetics\textsuperscript{10,22} (MRI without and with contrast) [One of the following]
A. Mulder’s sign or click
B. Pain persists after a series of steroid injections

X. Soft tissue mass including soft tissue sarcoma\textsuperscript{23-26} (MRI without and with contrast) [One of the following]
Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
A. Nondiagnostic initial x-ray study
B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration

C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
      a. After preoperative radiotherapy and preoperative planning prior to resection
      b. After surgical resection
      c. After adjuvant radiotherapy
      d. Suspected local recurrence
      e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
   3. Surveillance:
      a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
      b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
   4. Suspicion of local recurrence

XI. Tarsal tunnel syndrome, posterior tibial nerve compression with negative x-rays [All of the following]
   A. Clinical findings [One of the following]
      1. Aching, burning or tingling, numbness of the sole of the foot, toes or heel
      2. Positive Tinel’s sign posterior to medial malleolus
      3. Positive dorsiflexion-eversion test
   B. Incomplete resolution conservative management [One of the following]
      1. Rest and non weight bearing
      2. Continued pain after treatment with anti-inflammatory medication for at least 4 weeks unless contraindicated
      3. Injections of steroids or local anesthesia
      4. Pain worsening during treatment as described above

XII. Primary or metastatic bone tumor of the lower extremity – known or suspected – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)

7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the lower extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the lower extremity [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the lower extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
a. Plain x-ray of primary site every 6 months for 2 years, then annually
b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

5. Surveillance - High grade (grade II, grade III, or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the **lower extremity** [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the **lower extremity** [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the leg with known malignancy and non-diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the leg
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non-diagnostic bone scan
   4. Positive bone scan in the leg with no pain

**XIII. Child abuse**

**XIV. Lisfranc injury or fracture and x-rays are normal or indeterminate**[One of the following]
A. Acute injury of the foot
B. Pain, swelling and inability to bear weight
XV. **Gaucher's Disease**[^31^-^39] (MRI abdomen without contrast [CPT® 74181] and MRI lower extremity without contrast [CPT® 73718] as follows:

A. Patients not on enzyme therapy - every 12 to 24 months
B. Patients on enzyme therapy every 12 months:
   1. For change in dose of medication
   2. Complication from medication specific for treatment of Gaucher’s disease or clinical complication
   3. Individuals with active bone disease may require more frequent monitoring than once a year

XVI. **Gout** - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis

XVII. **Paget’s Disease**

A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

XVIII. **Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures**

A. X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
B. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays

XIX. **Diabetic Foot Infection** – X-ray and MRI foot without and with contrast (CPT® 73720) or MRI foot without contrast (CPT® 73718) for suspected osteomyelitis or soft tissue infection as a complement to x-ray (both x-ray and MRI are indicated)

References:

8. Karageanes SJ. Peroneal tendon syndromes treatment and management.
   http://www.nccn.org/professionals/physician_gls/pdf/sarcoma.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Soft Tissue Sarcoma V2.2014. ©2014 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.
   American College of Radiology ACR Appropriateness Criteria – Primary Bone Tumors.
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37. Hemochromatosis. Duchini, Andrea; Chief Editor (Updated April 18, 2014).


73718 MRI Lower Extremity Other than Joints
I. Suspected or known osteomyelitis with bone pain\(^1\)\(^\text{-}^5\) [One of the following]
   A. Clinical and laboratory findings [One of the following]
      1. ESR >22 mm/hr
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/cu.mm
      4. C-reactive protein >10 mg/L
      5. Blood culture positive
      6. X-ray suggestive of osteomyelitis
   B. History of diabetes, dialysis or peripheral vascular disease
   C. History of penetrating injury or surgery near the involved bone
   D. Sinus tract, poor wound or fracture healing
   E. Preoperative evaluation of osteomyelitis
   F. Positive probe to bone test
   G. Post treatment evaluation
   H. Suspicion of infected prosthesis (nuclear studies)
   I. Chronic wound overlying surgical hardware
   J. Chronic wound overlying a fracture
   K. Exposed bone

II. Primary or metastatic bone tumor of the lower extremity – known or suspected\(^6\)\(^\text{-}^8\) – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
      6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the **lower extremity** [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow up after treatment
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the **lower extremity** [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the **lower extremity** [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental:
      a. Plain x-rays of the primary tumor site should be completed every 6 months for 2 years, then annually
b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the **lower extremity** [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the **lower extremity** [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone [One of the following]
   1. Bone pain in the leg with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the leg
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the leg with no pain

**III. Soft tissue mass including soft tissue sarcoma**[^9-13] (MRI without and with contrast) [One of the following]

Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.

A. Nondiagnostic initial x-ray study

B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration

C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
2. Restaging:
   a. After preoperative radiotherapy and preoperative planning prior to resection
   b. After surgical resection
   c. After adjuvant radiotherapy
   d. Suspected local recurrence
   e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease

3. Surveillance:
   a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
   b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually

4. Suspicion of local recurrence

IV. Arteriovenous malformation or venous malformation\textsuperscript{14-17} \textbf{[One of the following]}
   A. Hypertrophy of soft tissues of the extremity
   B. Limb length discrepancy
   C. History of Klippel-Trenaunay syndrome of variant
   D. History of Osler-Weber-Rendu syndrome
   E. History of Parkes Weber syndrome
   F. Hemorrhage into a limb
   G. Reddish pulsatile mass \textbf{[One of the following]}
      1. Thrill
      2. Bruit
   H. Port-wine stain
   I. Dilated veins
      1. Must have negative duplex Doppler evaluation for venous insufficiency
   J. Congenital lipomatous overgrowth
   K. Vascular malformations
   L. Epidermal nevi
   M. Scoliosis/skeletal/spinal anomalies (CLOVES) syndrome
   N. Capillary malformations also known as port wine stains are characterized by a collection of small vascular channels in the dermis and generally do not require imaging because the diagnosis is made clinically. However, MR imaging may be required to evaluate an occult underlying neurologic structures, since these malformations are associated with encephalocele, spinal dysraphism, or Sturge-Weber syndrome

V. Morton’s neuroma with non diagnostic ultrasound and incomplete resolution with conservative management consisting of shoe modification or orthotics, anti-inflammatory medication or local injection of steroids and/or local anesthetics (MRI without and with contrast) \textbf{[One of the following]}\textsuperscript{18-21}
   A. Mulder’s sign or click
B. Pain persists after a series of steroid injections

VI. **Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]**
   A. Aural temperature >38.3°C or >100.9°F
   B. Leukocytosis, WBC >11,500/cu.mm
   C. ESR >22 mm/hr
   D. CRP >10 mg/L

VII. **Foreign Body - CT without contrast or MRI without and with contrast of the area of interest can be approved after x-rays rule out the presence of radiopaque foreign bodies**

VIII. **Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis**

IX. **Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures - X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated**

X. **Foot - Tarsal Tunnel Syndrome – following x-ray and 6 weeks of conservative treatment - MRI foot without contrast (CPT®73718) or MRI foot without and with contrast (CPT®73720) for preoperative planning if mass/lesion is suspected as etiology of entrapment.**

XI. **Paget’s Disease**
   A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
   B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

XII. **Diabetic Foot Infection - X-ray and MRI foot without and with contrast (CPT®73720) or MRI foot without contrast (CPT®73718) for suspected osteomyelitis or soft tissue infection as a complement to x-ray (both x-ray and MRI are indicated)**

References:

73719, 73720 MRI Lower Extremity Other than Joints
I. Chronic hip pain (more than 3 months) with negative or non diagnostic x-ray and no history of trauma, cancer, or infection and incomplete resolution after at least 4 weeks of conservative management as described in A below\textsuperscript{1-4}

A. Incomplete resolution with conservative management [One of the following]
   1. Continued pain after treatment with anti-inflammatory medication and physical therapy for at least 4 weeks
   2. Symptoms worsening while under treatment

II. Suspected intra-articular loose body with recent x-ray\textsuperscript{5}(MRI without contrast or MR arthrogram)

A. Clinical presentation [One of the following]
   1. Joint pain
   2. Locking
   3. Giving way
   4. Clicking

III. Suspected or known avascular necrosis\textsuperscript{1,6-8} (osteonecrosis, AVN,) with pain and recent x-ray (MRI without contrast) [(A and B) or C]

A. Risk factors and pain [One of the following]
   1. Steroid use
   2. Sickle cell disease
   3. Excessive alcohol use
   4. HIV infection
   5. SLE
   6. Renal transplant
   7. Trauma [One of the following]
      a. Fracture
      b. Dislocation
   8. Coagulopathy
   9. Bisphosphonates
   10. Smoking
   11. Pancreatitis
   12. Gaucher’s disease

B. Physical findings and history [One of the following]
   1. Radiography with a collapsed femoral head
   2. Hip pain with normal x-ray and a risk factor in A
   3. Stress fracture of the femoral neck
   4. Pain increases with activity
5. Pain in the groin or buttocks
6. Pain with internal rotation
7. Limited range of motion
C. Clarification of findings on recent x-ray which are not diagnostic of AVN (may show mottling of the femoral head which is suspicious for AVN)

IV. Suspected hip fracture with negative x-ray\textsuperscript{9-11}
A. For suspected hip/femoral neck, MRI without contrast can be performed if the initial evaluation of history, physical exam and x-ray fails to establish a definitive diagnosis
B. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:
   1. Repeat x-rays remain non-diagnostic for fracture after a minimum of 10 days of provider-directed conservative treatment
   2. Initial x-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture
C. For stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study.

V. Hip injury\textsuperscript{11}
A. Suspected femoral neck fracture with negative x-rays

VI. Post-Operative Joint Replacement Surgery – following x-ray
A. CT hip without contrast (CPT\textsuperscript{®}73700) or MRI hip without contrast (CPT\textsuperscript{®}73721) is appropriate to evaluate suspected particle disease (aggressive granulomatous disease) of the hip when infection has been excluded
B. MRI hip without contrast (CPT\textsuperscript{®}73721) for possible nerve injury
C. Following 6 weeks conservative treatment - MRI hip without contrast (CPT\textsuperscript{®}73721) for suspected tendinitis/bursitis

VII. Gaucher’s disease at initial diagnosis and then every two years\textsuperscript{12,13}

VIII. Legg-Calve-Perthes disease\textsuperscript{14}
A. Limp
B. Hip, thigh or knee pain

IX. Slipped capital femoral epiphysis with positive x-ray\textsuperscript{15}

X. Femoroacetabular impingement syndrome or hip impingement and an x-ray that is negative, nondiagnostic or equivocal\textsuperscript{17-19} (MR arthrogram, CPT\textsuperscript{®} 73722)
A. Symptoms [One of the following]
   1. Hip pain with prolonged sitting
   2. Difficulty getting in and out of a car
   3. Pain reproduced by flexion or adduction or internal rotation of the hip when supine.-impingement test
4. Complaints of anterolateral hip pain
5. Positive Patrick (FABER) test
6. Positive FADIR test (flexion-adduction-internal rotation)

XI. Labral tear\textsuperscript{20,21} (MR arthrogram, CPT 73722)
A. Symptoms [One of the following]
   1. Groin pain
   2. Clicking
   3. Instability
   4. Decreased range of motion
   5. Locking
   6. Catching
   7. Positive FADIR test (flexion-adduction-internal rotation)
B. Radiographic findings suggestive of impingement such as cam lesion or pincer lesion

XII. Pigmented villonodular synovitis or osteochondromatosis with positive x-rays\textsuperscript{1}

XIII. Child abuse

XIV. Soft tissue mass including soft tissue sarcoma\textsuperscript{22-26} (MRI without and with contrast) [One of the following]Note: Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
A. Nondiagnostic initial x-ray
B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
      a. After preoperative radiotherapy and preoperative planning prior to resection
      b. After surgical resection
      c. After adjuvant radiotherapy
      d. Suspected local recurrence
      e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
   3. Surveillance:
      a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
      b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
   4. Suspicion of local recurrence
XV. Primary or metastatic bone tumor of the lower extremity – known or suspected\textsuperscript{27-29} – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]

A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
   1. Negative or does not explain the regional symptoms (MRI without contrast)
   2. Suspicious for osteoid osteoma clinically or radiographically (CT)
   3. Indeterminate for malignancy (MRI without and with contrast)
   4. Aggressive appearance on x-ray (MRI without and with contrast)
   5. Pathologic fracture; not definitely benign (MRI without and with contrast)
   6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
   7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
      a. Diagnosis uncertain based on x-ray appearance.
      b. Imaging requested for preoperative planning

B. Osteosarcoma of the lower extremity [One of the following] (MRI without and with contrast)
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment]
a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
   i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
   ii. To clarify inconclusive findings on plain x-ray
   iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the **lower extremity** (MRI without and with contrast)
   [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT scan [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
2. Known diagnosis and planning for surgery
3. Known diagnosis and planning for radiofrequency ablation
4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone (MRI without and with contrast)
   [One of the following]
   1. Bone pain in the hip with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the hip
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the hip with no pain

XVI. Osteochondral defect or osteochondritis dissecans\textsuperscript{30,31} [One of the following]
   A. Positive x-ray for osteochondral defect to stage for stability
   B. Catching, or stiffness or locking or instability with negative x-ray
   C. Chronic joint pain after trauma despite appropriate treatment and a negative x-ray
   D. Effusion or crepitus or tenderness with negative x-ray
   E. X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
   F. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays

XVII. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis

XVIII. Paget’s Disease
   A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
   B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected
References:

15. Tins B, Cassar-Pullicino V, McCall I. The role of pretreatment MRI in established cases of slipped capital femoral epiphysis, Europ J Radiol, 2009; 70:570-578.
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73721 MRI Lower Extremity Joint: Hip
73721  MRI Lower Extremity Joint without Gadolinium: Knee

See Also: Hip, Ankle

I. Chronic knee pain/swelling and/or giving way (instability) (more than 3 months) with negative or non diagnostic x-ray and no history of trauma, cancer, or infection and incomplete resolution after at least 4 weeks of conservative management as described in A below\(^1,2\)

A. Incomplete resolution with conservative management [One of the following]
   1. Continued pain after treatment with anti-inflammatory medication and physical therapy for at least 4 weeks
   2. Symptoms worsening while under treatment

II. Suspected intra-articular loose body with recent x-ray\(^2\) (MRI without contrast)

A. Clinical presentation [One of the following]
   1. Joint pain
   2. Locking
   3. Giving way
   4. Clicking

III. Suspected or known avascular necrosis (osteonecrosis, AVN) with pain and recent x-ray\(^2-5\) (MRI without contrast) [(A and B) or C or D or E]

A. Risk factors and pain [One of the following]
   1. Steroid use
   2. Sickle cell disease
   3. Excessive alcohol use
   4. HIV infection
   5. SLE
   6. Renal transplant
   7. Trauma [One of the following]
      a. Fracture
      b. Dislocation
   8. Coagulopathy
   9. Bisphosphonates
   10. Smoking
   11. Pancreatitis
   12. Gaucher’s disease

B. Physical findings and history [One of the following]
   1. Catching
2. Locking  
3. Snapping  
4. Inability to bear weight  
5. Popping  
6. Swelling and/or effusion  
7. Tenderness  
8. Giving way  
9. Stiffness  
10. Crepitus

C. Clarification of findings on recent x-ray which are not diagnostic of AVN  
D. Child or adolescent with x-rays showing osteochondral injuries such as a osteochondritis dessicans or a loose body or osteochondral defect  
E. Adult with avascular necrosis on x-ray if additional information is needed for treatment

IV. Suspected fracture\(^6-8\) [One of the following]
A. X-ray shows no fracture or there is a Segond fracture on x-ray [One of the following]  
   1. Focal tenderness  
   2. Effusion  
   3. Inability to bear weight  
B. Tibial plateau fracture on x-ray [one of the following] (CT is the appropriate study per ACR)  
   1. Focal tenderness  
   2. Effusion  
   3. Inability to bear weight  
C. Motor vehicle accident (MVA) and suspicion of posterior dislocation  
D. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:  
   1. Repeat x-rays remain non-diagnostic for fracture after a minimum of 10 days of provider-directed conservative  
   2. Initial x-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture  
E. Bone scan positive but not specific for fracture  
F. Osteoporosis on bone density or long term steroid use  
G. Child abuse  
H. For stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study

V. Knee injuries\(^9-20\) [One of the following]
A. Knee pain secondary to acute injury and negative or non diagnostic x-ray or x-ray showing Segond fracture [One of the following]  
   1. Joint effusion  
   2. Inability to bear weight  
   3. Pain significantly limiting mobility on physical examination  
   4. Locked knee
5. Ability to fully extend the knee (inability- not in ability)
6. Meniscal tear [One of the following]
   a. Bloody effusion
   b. Locking
   c. Inability to fully extend the knee
   d. Crepitus
   e. Buckling and catching
   f. Joint line tenderness
   g. Positive Apley test
   h. Positive Thessaly test
7. Motor vehicle accident with suspected posterior dislocation of the knee

B. Injuries to ligaments [One of the following]
   1. Suspected anterior cruciate ligament injury [One of the following]
      a. Rapid development of an effusion which may be bloody
      b. Instability of the knee
      c. Positive anterior drawer sign
      d. Positive Lachman’s sign
      e. Positive pivot shift test
   2. Suspected posterior cruciate ligament injury with incomplete resolution after a trial of immobilization and physical therapy for at least 4 weeks [One of the following]
      a. Positive posterior drawer sign
      b. Absent tibial step off (tibia should protrude 1 cm beyond femur at 90 degrees of flexion) or positive posterior tibial sag sign (Godfrey test)
      c. Positive reverse pivot shift test
      d. Rapid onset of swelling
   3. Suspected LCL or MCL injury
      a. MCL
         i. Positive valgus stress test (knee opens medially with stress to tibia)
      b. LCL
         i. Positive varus stress test
   C. Suspected quadriceps tendon injury [One of the following]
      1. Acute knee pain and swelling
      2. Difficulty ambulating
      3. Bruising
      4. Palpable defect in the suprapatellar area
      5. Low lying patella
      6. Limited extension
   D. Infrapatellar tendon injury (jumper’s knee) or tear with negative or non-diagnostic x-ray or x-rays demonstrate an effusion or non-diagnostic ultrasound
VI. Suspected meniscal tear without history of acute injury and a negative or non-diagnostic x-ray\textsuperscript{16-18} [One of the following]

A. Findings on physical examination and with incomplete resolution after conservative management consisting of RICE and physical therapy for at least 4 weeks or symptoms worsening with conservative management [One of the following]
1. Positive McMurray’s test
2. Positive Apley test
3. Positive Thessaly test
4. Joint line tenderness
5. Effusion
6. Pain with flexion and rotation
7. A sensation of popping, clicking, or snapping

B. Inability to straighten the knee – locked

VII. Tendonitis or tendinosis with pain and tenderness on palpation over the tendon and incomplete resolution after course of conservative management for at least 4 weeks to include anti-inflammatory medications, activity modification and physical therapy\textsuperscript{19} (may be a course of home exercises)

VIII. Suspected Baker’s cyst or popliteal cyst\textsuperscript{2} (ultrasound)

IX. Patellofemoral pathology or runner’s knee\textsuperscript{1,2,20,21} (including patellar tracking disorder) with either negative x-ray or x-ray demonstrating an effusion, degenerative arthritis, or chondrocalcinosis and with incomplete resolution with conservative management consisting of physical therapy for at least 6 weeks [Both of the following]

A. Symptoms and history [One of the following]
1. Anterior knee pain or pain described as behind underneath or around the patella
2. Pain on squatting
3. Pain when walking up or down stairs

B. Clinical findings [One of the following]
1. Positive apprehension test for patella dislocation
2. Positive Clark’s test
3. Popping or clicking of the patella
4. Abnormal patella tracking
5. Positive patella grind test

X. Knee Joint Dislocation – following x-ray - MRI knee without contrast (CPT\textsuperscript{®}73721) and MRA knee without and with contrast (CPT\textsuperscript{®}73725) following significant trauma to evaluate for ligament and vascular injury
XI. Patellar Dislocation – following x-ray - MRI knee without contrast (CPT®73721) with acute knee injury, consideration of surgery and concern for osteochondral fracture or loose osteochondral fracture fragment

XII. Recurrent Patellar Instability – following x-ray and 6 weeks of conservative treatment - MRI knee without contrast (CPT®73721) if consideration for surgery

XIII. Fitting of implants for total knee arthroplasty - In the absence of written payor instructions, CT/MRI should not be submitted for prior authorization with a diagnostic CT or MRI procedure code for preoperative treatment planning for customized to patient joint replacement surgery or Computer-Assisted Musculoskeletal Surgical Navigation Procedures because it is NOT for diagnostic purposes. Preoperative imaging studies (CT/MRI) utilized as part of intraoperative navigation for joint replacement surgery (e.g., MAKOplasty) are considered not medically necessary

XIV. Post-Operative Knee Replacement Surgery – following x-ray and 6 weeks of conservative treatment - MRI knee without contrast (CPT®73721) for suspected periprosthetic soft tissue abnormality unrelated to infection (e.g., tendinopathy, arthrofibrosis, patellar clunk syndrome, impingement of nerves or other soft tissue

XV. Septic arthritis – See 73722 and 73723

XVI. Aggressive arthritis – See 73722 and 73723

XVII. Osteomyelitis – See 73722 and 73723

XVIII. Child abuse

XIX. Soft tissue mass including soft tissue sarcoma (MRI without and with contrast) [One of the following]Note: Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
   A. Nondiagnostic initial x-ray study
   B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
   C. Soft tissue sarcoma of the extremity [One of the following]
      1. Initial staging of primary site
      2. Restaging:
a. After preoperative radiotherapy and preoperative planning prior to resection
b. After surgical resection
c. After adjuvant radiotherapy
d. Suspected local recurrence
e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease

3. Surveillance:
   a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
   b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually

4. Suspicion of local recurrence

XX. Primary or metastatic bone tumor of the lower extremity – known or suspected\textsuperscript{28-30} – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
      6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
      7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
         a. Diagnosis uncertain based on x-ray appearance.
         b. Imaging requested for preoperative planning
   B. Osteosarcoma of the lower extremity (MRI without and with contrast) [One of the following]
      1. Initial staging of primary site
      2. After preoperative chemotherapy
      3. At 6 weeks following local control surgery
      4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
      5. Follow-up after treatment:
         a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year then annually for 2 years
b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
   i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
   ii. To clarify inconclusive findings on plain x-ray
   iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment]
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical

G. Osteoid osteoma with negative CT scan [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone (MRI without and with contrast) [One of the following]
   1. Bone pain in the knee with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the knee
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the knee with no pain

XXI. Osteochondral defect or osteochondritis dissecans[^30,^31] [One of the following]
   A. Positive x-ray for osteochondral defect to stage for stability
   B. Catching, or stiffness or locking or instability with negative x-ray
   C. Chronic joint pain after trauma despite appropriate treatment and a negative x-ray
   D. Effusion or crepitus or tenderness with negative x-ray
   E. X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
   F. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays.

XXII. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis
XXIII. Paget’s Disease

A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

References:


73721 MRI Lower Extremity Joint: Knee
### 73721  MRI Lower Extremity Joint without Gadolinium: Ankle

**See Also:** Hip, Knee

**I.** Chronic ankle or foot pain (more than 3 months) with negative or non diagnostic x-ray and no history of trauma, cancer, or infection and incomplete resolution after at least 4 weeks of conservative management as described in A below\(^1\)\(^-\)\(^3\)

A. Incomplete resolution with conservative management [One of the following]
   1. Continued pain after treatment with anti-inflammatory medication and physical therapy for at least 4 weeks
   2. Symptoms worsening while under treatment

**II.** Suspected intra-articular loose body with recent x-ray\(^4\)\(^,\)\(^5\) (MRI without contrast or MR arthrogram)

A. Clinical presentation [One of the following]
   1. Joint pain
   2. Locking
   3. Clicking
   4. Giving way

**III.** Suspected or known avascular necrosis (osteonecrosis, OCD, AVN, osteochondritis dissecans) with pain and an x-ray which is either equivocal or negative\(^1\)\(^,\)\(^5\) [(A and B) or C]

A. Risk factors and pain [One of the following]
   1. Steroid use
   2. Sickle cell disease
   3. Excessive alcohol use
   4. HIV infection
   5. SLE
   6. Renal transplant
   7. Trauma [One of the following]
      a. Fracture
      b. Dislocation
   8. Coagulopathy
   9. Bisphosphonates
   10. Smoking
   11. Pancreatitis
   12. Gaucher’s disease

B. Physical findings and/or history [One of the following]
   1. Swelling
   2. Stiffness
3. Weakness
4. Symptoms exacerbated by prolonged standing
5. Joint effusion
6. Instability
7. Giving way
8. Catching
9. Grinding

C. Clarification of findings on recent x-ray which are not diagnostic of AVN

IV. Suspected fracture (stress, insufficiency, or occult) with negative or non diagnostic x-ray at the onset of pain\(^6-10\) [One of the following]
A. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:
   1. Repeat x-rays remain non-diagnostic for fracture after a minimum of 10 days of provider-directed conservative)
   2. Initial x-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture
B. Bone scan positive but not specific for fracture
C. Osteoporosis on bone density scan or long term steroid use
D. Child abuse
E. Suspected Lisfranc fracture (See XIII below)
F. For stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study

V. Suspected tarsal coalition with pain relieved by rest and non diagnostic CT scan\(^11\) (CT) [One of the following]
A. Painful rigid flatfoot

VI. Plantar fasciitis incomplete resolution after at least 6 weeks of activity modification and anti-inflammatory medication with home exercises and/or physical therapy and recent x-ray\(^1,13-18\) [One of the following]
A. Pain on initiation of walking especially along the medial side of the heel
B. Increasing heel pain with prolonged weight bearing
C. Morning heel pain
D. Pronated foot
E. Localized swelling or atrophy of the infracalcaneal heel pad
F. Known rheumatoid arthritis, gout, SLE or seronegative spondyloarthropathies

VII. Ankle injuries with negative or non diagnostic x-rays\(^19-27\)
A. Achilles tendon tear or rupture with an ultrasound that does not explain the symptoms and a complaint of pain over the Achilles tendon [Both of the following]
   1. Symptoms [One of the following]
      a. Posterior heel pain proximal to tendon insertion
b. Stiffness on weight bearing after prolonged immobility

2. Findings on examination [Two or more of the following]
   a. Decreased ankle plantar flexor strength
   b. Limited ability to perform repetitive heel raises
   c. Positive arc sign
   d. Positive Thompson test or Simmonds squeeze test
   e. Palpable gap in the tendon
   f. Increased passive ankle dorsiflexion and gentle manipulation

B. Peroneal tendon syndromes and incomplete resolution after NSAIDS (if not contraindicated) for at least 4 weeks and non diagnostic x-ray (Only one MRI is required to image the entire peroneal tendon) [One of the following]
   1. Tendinitis [One of the following]
      a. Pain and swelling behind and distal to the lateral malleolus
      b. Ankle pain with active eversion and dorsiflexion against resistance
   2. Peroneal tendon subluxation [One of the following]
      a. Snapping along the lateral ankle
      b. Pain along the lateral ankle
      c. Pain with toe walking
      d. Pain and swelling over the posterior lateral ankle
   3. Peroneal tendon tear [One of the following]
      a. Acute injury with pain and swelling inferior and posterior to lateral malleolus
      b. Chronic injury increasing pain inferior and posterior to the lateral malleolus
   4. Ankle sprains incomplete resolution after to conservative management for at least 4 weeks with anti-inflammatory nonsteroidals (unless contraindicated)
      a. Physical examination [One of the following]
         i. Swelling and/or bruising
         ii. Tenderness
         iii. Difficulty bearing weight

C. Anterior tibiofibular ligament injury (may be associated with proximal fracture of the fibula)
   1. Physical examination [One of the following]
      a. Pain with dorsiflexion of the ankle
      b. Point tenderness over the anterior lateral tibiofibular joint
      c. Lateral ankle instability
      d. Positive squeeze test
   2. Positive external rotation stress test

D. Deltoid ligament injury
   1. Pain medial side of joint with history of injury

E. Anterior talofibular ligament (ATFL) injury
   1. Findings on physical examination [One of the following]
      a. Pain anterolateral side of joint
      b. Edema anterolateral side of joint
      c. Positive anterior draw test limited and painful inversion of the ankle
F. Calcaneofibular ligament injury
   1. Findings on physical examination [One of the following]
      a. Pain on lateral side of joint
      b. Swelling lateral side of joint
      c. Ecchymosis lateral side of joint
      d. Positive talar tilt test

G. Suspected posterior tibial tendon rupture [One of the following]
   1. Pain and tenderness along tendon path (especially posterior to the medial malleolus)
   2. Patient is unable to lift heel off ground when standing on one foot

H. Posterior tibial tendinopathy [One of the following]
   1. Pain and swelling posterior to the medial malleolus
   2. Pain in the medial aspect of the ankle which increases with weight bearing and inversion and plantar flexion against resistance

I. Anterior tibial tendinopathy [One of the following]
   1. Pain over the anterior ankle
   2. Weak dorsiflexion of the foot

VIII. Achilles tendinopathy or tendonitis with incomplete resolution after 6 months of conservative management to consist of anti-inflammatory medication, usually NSAIDS (if not contraindicated) [One of the following]
   A. Pain or tenderness proximal to the insertion to the calcaneus
   B. Crepitation

IX. Anterior tibial tendinopathy [One of the following]
   A. Pain over the anterior ankle
   B. Weak dorsiflexion of the foot

X. Morton’s neuroma with negative x-rays and equivocal ultrasound and incomplete resolution with conservative management consisting of shoe modification or orthotics, anti-inflammatory medication or local injection of steroids and/or local anesthetics\(^\text{11,29-32}\) (MRI without and with contrast) [One of the following]
   A. Mulder’s sign or click after a series of steroid and/or local anesthetic injections
   B. Numbness, tingling or burning pain that radiates to the toes which persists after a series of steroid and/or local anesthetic injections

XI. Lisfranc injury with negative or non diagnostic x-rays\(^\text{33}\) [One of the following]
   A. Inability to bear weight
   B. Swelling
   C. Pain of the mid-foot
   D. Bruising on the dorsum of the foot
XII. Os trigonum syndrome with negative or non diagnostic x-ray and incomplete resolution with conservative therapy consisting of physical therapy and steroid injections [Both of the following][34,35]
   A. Symptoms [One of the following]
      1. Pain posterior ankle which may be exacerbated by plantar or dorsiflexion
      2. Swelling posterior ankle
   B. Clinical examination [One of the following]
      1. Tenderness anterior to the Achilles' tendon and posterior to the talus
      2. May have a palpable soft tissue thickening

XIII. Child abuse

XIV. Soft tissue mass including soft tissue sarcoma[36-39](MRI without and with contrast) [One of the following] Note: Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
   A. Nondiagnostic initial x-ray
   B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
   C. Soft tissue sarcoma of the extremity [One of the following]
      1. Initial staging of primary site
      2. Restaging:
         a. After preoperative radiotherapy and preoperative planning prior to resection
         b. After surgical resection
         c. After adjuvant radiotherapy
         d. Suspected local recurrence
         e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
      3. Surveillance:
         a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
         b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
      4. Suspicion of local recurrence

XV. Primary or metastatic bone tumor of the lower extremity – known or suspected[28,40,41] – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
2. Suspicious for osteoid osteoma clinically or radiographically (CT)
3. Indeterminate for malignancy (MRI without and with contrast)
4. Aggressive appearance on x-ray (MRI without and with contrast)
5. Pathologic fracture; not definitely benign (MRI without and with contrast)
6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for the next 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the **lower extremity** (MRI without and with contrast)
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT scan [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone (MRI without and with contrast) [One of the following]
   1. Bone pain in the ankle or foot with known malignancy and non diagnostic bone scan
2. Known bone metastases with pathologic fracture in the ankle or foot
3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
4. Positive bone scan in the ankle or foot with no pain

XVI. Osteochondral defect or osteochondritis dissecans\textsuperscript{42,43} [One of the following]
A. Positive x-ray for osteochondral defect to stage for stability
B. Catching, or stiffness or locking or instability with negative x-ray
C. Chronic joint pain after trauma despite appropriate treatment and a negative x-ray
D. Effusion or crepitus or tenderness with negative x-ray
E. X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
F. MRI without contrast or CT without contrast is indicated when healing cannot be adequately assessed on follow-up x-rays

XVII. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis

XVIII. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected
References:


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73721 MRI Lower Extremity Joint: Ankle
73722 MRI Lower Extremity Joint with Gadolinium: Hip
73723 MRI Lower Extremity Joint without and with Gadolinium: Hip

See Also: Knee, Ankle

I. Suspected or known osteomyelitis\(^1-7\) [One of the following]
   A. Clinical and laboratory findings [One of the following]
      1. ESR >22 mm/hr
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/cu.mm
      4. C-reactive protein >10 mg/L
      5. Blood culture positive
      6. X-ray suggestive of osteomyelitis
   B. History of diabetes, dialysis or peripheral vascular disease
   C. History of penetrating injury or surgery near the involved bone
   D. Sinus tract, poor wound or fracture healing
   E. Preoperative evaluation of osteomyelitis
   F. Positive probe to bone test
   G. Post treatment evaluation
   H. Suspicion of infected prosthesis (nuclear studies)
   I. Chronic wound overlying surgical hardware
   J. Chronic wound overlying a fracture
   K. Exposed bone

II. Primary or metastatic bone tumor of the lower extremity – known or suspected\(^8-10\) – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
      6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the **lower extremity** [One of the following] (MRI without and with contrast)
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for the next 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
4. Surveillance - Low grade and intracompartmental
   a. Plain x-ray of primary site every 6 months for 2 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the **lower extremity** (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

G. Osteoid osteoma with negative CT scan [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone (MRI without and with contrast) [One of the following]
   1. Bone pain in the hip with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the hip
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the hip with no pain
III. Arthritis and synovitis\textsuperscript{11-13} with either inadequate response to current treatment or to monitor response to treatment with known rheumatoid or gout or psoriatic arthritis or ankylosing spondylitis

IV. Osteoarthritis - MRI arthrogram or CT arthrogram is appropriate when joint sparing/salvage reconstructive surgery is planned for suspected concomitant labral tear of the hip

V. MR arthrogram\textsuperscript{14,15} [One of the following]
   A. X-rays consistent with femoroacetabular impingement
   B. Labral tear [One of the following]
      1. Pain
      2. Clicking
      3. Instability
      4. Decreased range of motion
      5. Locking
      6. Catching
      7. Positive FADIR test (flexion-adduction-internal rotation)
   C. X-rays positive for a loose body or osteochondral defect
   D. Clinically suspect loose body with negative x-ray

VI. Septic joint and arthrocentesis is contraindicated or not diagnostic\textsuperscript{16} (Ultrasound or x-ray guided arthrocentesis) [Both of the following]
   A. Symptoms [One of the following]
      1. Decreased range of motion
      2. Acute development of a hot swollen joint (<2 weeks)
   B. Laboratory tests [One of the following]
      1. ESR >22 mm/hr
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/cu.mm
      4. C-reactive protein >10 mg/L

VII. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]
   A. Aural temperature >38.3°C or >100.9°F
   B. Leukocytosis, WBC >11,500/cu.mm
   C. ESR >22 mm/hr
   D. C-reactive protein >10 mg/L

VIII. Femoroacetabular impingement syndrome or hip impingement and an x-ray that is negative, non diagnostic or equivocal\textsuperscript{17-19} (MR arthrogram, CPT 73722)
   A. Symptoms [One of the following]
      1. Hip pain with prolonged sitting
      2. Difficulty getting in and out of a car
3. Pain reproduced by flexion or adduction or internal rotation of the hip when supine - impingement test
4. Complaints of anterolateral hip pain
5. Positive Patrick (FABER) test
6. Positive FADIR test (flexion-adduction-internal rotation)

IX. Soft tissue mass including soft tissue sarcoma\(^{20-24}\) (MRI without and with contrast) [One of the following] Note: Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
A. Nondiagnostic initial x-ray
B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
C. Soft tissue sarcoma of the extremity [One of the following]
   1. Initial staging of primary site
   2. Restaging:
      a. After preoperative radiotherapy and preoperative planning prior to resection
      b. After surgical resection
      c. After adjuvant radiotherapy
      d. Suspected local recurrence
      e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
3. Surveillance:
   a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
   b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
4. Suspicion of local recurrence

X. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest can be approved after x-rays rule out the presence of radiopaque foreign bodies.

XI. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis

XII. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected
XIII. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures - X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated.

References:


**73722, 73723 MRI Lower Extremity Joint: Hip**
73722 MRI Lower Extremity Joint with Gadolinium: Knee
73723 MRI Lower Extremity Joint without and with Gadolinium: Knee

See Also: Hip, Ankle

I. Suspected or known osteomyelitis\(^1-5\) [One of the following]
   A. Clinical and laboratory findings [One of the following]
      1. ESR >22 mm/hr
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/cu.mm
      4. C-reactive protein >10 mg/L
      5. Blood culture positive
      6. X-ray suggestive of osteomyelitis
   B. History of diabetes, dialysis or peripheral vascular disease
   C. History of penetrating injury or surgery near the involved bone
   D. Sinus tract, poor wound or fracture healing
   E. Preoperative evaluation of osteomyelitis
   F. Positive probe to bone test
   G. Post treatment evaluation
   H. Suspicion of infected prosthesis (nuclear studies preferred)
   I. Chronic wound overlying surgical hardware
   J. Chronic wound overlying a fracture
   K. Exposed bone

II. Primary or metastatic bone tumor of the lower extremity – known or suspected\(^6-8\) – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]
   A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
      1. Negative or does not explain the regional symptoms (MRI without contrast)
      2. Suspicious for osteoid osteoma clinically or radiographically (CT)
      3. Indeterminate for malignancy (MRI without and with contrast)
      4. Aggressive appearance on x-ray (MRI without and with contrast)
      5. Pathologic fracture; not definitely benign (MRI without and with contrast)
      6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
   a. Diagnosis uncertain based on x-ray appearance.
   b. Imaging requested for preoperative planning

B. Osteosarcoma of the lower extremity [One of the following] (MRI without and with contrast)
1. Initial staging of primary site
2. After preoperative chemotherapy
3. At 6 weeks following local control surgery
4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
5. Follow up after treatment:
   a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for the next 1 year, then annually for 2 years
   b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
      i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
      ii. To clarify inconclusive findings on plain x-ray
      iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the lower extremity (MRI without and with contrast) [One of the following]
1. Initial staging of primary site
2. After preoperative chemotherapy
3. At 3 months following local control surgery
4. At the end of planned chemotherapy
5. Follow-up after treatment:
   a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year then annually for 2 years
   b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
      i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
      ii. To clarify inconclusive findings on plain x-ray
      iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the lower extremity (MRI without and with contrast) [One of the following]
1. Initial staging of primary site
2. Restaging after completion of radiotherapy
3. Every 2 cycles during chemotherapy
4. Surveillance - Low grade and intracompartmental
   a. Plain x-ray of primary site every 6 months for 2 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
   a. Plain x-ray of primary site every 6 months for 5 years, then annually
   b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical

G. Osteoid osteoma with negative CT [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
   3. Known diagnosis and planning for radiofrequency ablation
   4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone (MRI without and with contrast) [One of the following]
   1. Bone pain in the knee with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the knee
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the knee with no pain
III. Arthritis and synovitis\textsuperscript{9-11} with either inadequate response to current treatment or to monitor response to treatment with known rheumatoid or gout or psoriatic arthritis or ankylosing spondylitis

IV. Soft tissue mass including soft tissue sarcoma\textsuperscript{12-15} (MRI without and with contrast) [One of the following] Note: Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
   A. Nondiagnostic initial x-ray
   B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
   C. Soft tissue sarcoma of the extremity [One of the following]
      1. Initial staging of primary site
      2. Restaging:
         a. After preoperative radiotherapy and preoperative planning prior to resection
         b. After surgical resection
         c. After adjuvant radiotherapy
         d. Suspected local recurrence
         e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
   3. Surveillance:
      a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
      b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
   4. Suspicion of local recurrence

V. Septic joint and arthrocentesis is contraindicated or not diagnostic\textsuperscript{16} (Ultrasound or x-ray guided arthrocentesis)[Both of the following]
   A. Symptoms [One of the following]
      1. Decreased range of motion
      2. Acute development of a hot swollen joint (<2 weeks)
   B. Laboratory tests [One of the following]
      1. ESR >22 mm/hr
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/ cu.mm
      4. C-reactive protein >10 mg/L

VI. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]
   A. Aural temperature >38.3°C or > 100.9°F
   B. Leukocytosis, WBC >11,500/cu.mm
   C. ESR >22 mm/hr
D. C-reactive protein >10 mg/ml

VII. MR arthrogram – knee pain\textsuperscript{17} [One of the following]
A. Suspected intra-articular loose body [One of the following]
   1. Pre-operative study
   2. Locking
   3. Clicking
B. Recurrent knee pain after arthroscopic or surgical intervention
C. MRI arthrogram or CT arthrogram is appropriate when joint sparing/salvage reconstructive surgery is planned for suspected concomitant internal derangement of the knee

VIII. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest can be approved after x-rays rule out the presence of radiopaque foreign bodies

IX. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis

X. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

XI. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures - X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
References:

73722  MRI Lower Extremity Joint with Gadolinium: Ankle
73723  MRI Lower Extremity Joint without and with Gadolinium: Ankle

See Also: Hip, Knee

I. Suspected or known osteomyelitis with pain\(^1-6\) [One of the following]
   A. Clinical and laboratory findings [One of the following]
      1. ESR >22 mm/hr
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/cu.mm
      4. C-reactive protein >10 mg/L
      5. Blood culture positive
      6. X-ray suggestive of osteomyelitis
   B. History of diabetes, dialysis or peripheral vascular disease
   C. History of penetrating injury or surgery near the involved bone
   D. Sinus tract, poor wound or fracture healing
   E. Preoperative evaluation of osteomyelitis
   F. Positive probe to bone test
   G. Post treatment evaluation
   H. Suspicion of infected prosthesis (nuclear studies)
   I. Chronic wound overlying surgical hardware
   J. Chronic wound overlying a fracture
   K. Exposed bone

II. Morton’s neuroma with negative x-rays and equivocal ultrasound and incomplete resolution with conservative management consisting of shoe modification or orthotics, anti-inflammatory medication or local injection of steroids and/or local anesthetics (MRI without and with contrast) [One of the following]\(^7-11\)
   A. Mulder’s sign or click after a series of steroid and/or local anesthetic injections
   B. Numbness, tingling or burning pain that radiates to the toes which persists after a series of steroid and/or local anesthetic injections

III. Arthritis and synovitis\(^12-14\) with either inadequate response to current treatment or to monitor response to treatment with known rheumatoid or gout or psoriatic arthritis or ankylosing spondylitis
IV. Primary or metastatic bone tumor of the lower extremity – known or suspected\textsuperscript{15-17} – An x-ray is required prior to imaging a suspected bone tumor; if the x-ray is definitely benign and the lesion is not an osteoid osteoma clinically or radiographically no further imaging is required [One of the following]

A. X-ray or CT results [One of the following] and suspected (not known) bone tumor
   1. Negative or does not explain the regional symptoms (MRI without contrast)
   2. Suspicious for osteoid osteoma clinically or radiographically (CT)
   3. Indeterminate for malignancy (MRI without and with contrast)
   4. Aggressive appearance on x-ray (MRI without and with contrast)
   5. Pathologic fracture; not definitely benign (MRI without and with contrast)
   6. Incidental finding on prior CT that is not definitely benign (MRI without and with contrast)
   7. Many benign bone tumors have a characteristic appearance on x-ray and advanced imaging is not necessary. MRI without and with contrast. MRI without contrast, or CT without contrast may be indicated if one of the following applies:
      a. Diagnosis uncertain based on x-ray appearance.
      b. Imaging requested for preoperative planning

B. Osteosarcoma of the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 6 weeks following local control surgery
   4. Restaging – every 2 cycles during chemotherapy and at the end of planned chemotherapy
   5. Follow up after treatment:
      a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for the next 1 year, then annually for 2 years
      b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
         i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
         ii. To clarify inconclusive findings on plain x-ray
         iii. To evaluate significant pain symptoms suggestive of primary site recurrence

C. Ewing’s sarcoma of the lower extremity (MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. After preoperative chemotherapy
   3. At 3 months following local control surgery
   4. At the end of planned chemotherapy
   5. Follow-up after treatment:
a. Plain x-rays of the primary tumor site should be completed every 3 months for 1 year, then every 4 months for 1 year, then every 6 months for 1 year then annually for 2 years
b. MRI is not routinely indicated for surveillance imaging of appendicular primary sites but should be approved for the following:
   i. The patient does not have an endoprosthesis that will cause MRI or CT artifact
   ii. To clarify inconclusive findings on plain x-ray
   iii. To evaluate significant pain symptoms suggestive of primary site recurrence

D. Chondrosarcoma of the **lower extremity** (MRI without and with contrast)
   [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Low grade and intracompartmental
      a. Plain x-ray of primary site every 6 months for 2 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms
   5. Surveillance - High grade (grade II, grade III or clear cell or extracompartmental)
      a. Plain x-ray of primary site every 6 months for 5 years, then annually
      b. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

E. Chordoma of the **lower extremity**(MRI without and with contrast)
   1. Initial staging of primary site [One of the following]
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 5 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms

F. Giant cell tumor of the bone in the **lower extremity**(MRI without and with contrast) [One of the following]
   1. Initial staging of primary site
   2. Restaging after completion of radiotherapy
   3. Every 2 cycles during chemotherapy
   4. Surveillance - Plain x-ray of primary site every 6 months for 2 years, then annually until year 10
   5. MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical

G. Osteoid osteoma with negative CT scan [One of the following]
   1. Clinical [One of the following]
      a. Bone pain worse at night which is relieved by aspirin
      b. Pain increases with activity
   2. Known diagnosis and planning for surgery
3. Known diagnosis and planning for radiofrequency ablation
4. Known diagnosis and post intervention evaluation to establish a new baseline

H. Known primary malignancy other than bone (MRI without and with contrast)
   [One of the following]
   1. Bone pain in the ankle or foot with known malignancy and non diagnostic bone scan
   2. Known bone metastases with pathologic fracture in the ankle or foot
   3. Elevated alkaline phosphatase (>140 IU/L) with known malignancy and non diagnostic bone scan
   4. Positive bone scan in the ankle or foot with no pain

V. MR arthrogram [One of the following]
   A. Suspected intra-articular loose body [One of the following]
      1. Pre-operative study
      2. Locking
      3. Clicking
      4. Giving way
   B. Anterior tibiofibular ligament injury with non diagnostic MRI and no response to rest, ice, elevation, compression, pain medications such as acetaminophen and exercise for at least 3 weeks

VI. Anterior Impingement Anterior- Lateral Impingement Posterior Impingement (e.g., Os Trigonum Syndrome) – following x-ray and 6 weeks of conservative treatment - MRI ankle with contrast (arthrogram) (CPT®73722) or CT ankle with contrast (arthrogram) (CPT®73701) or MRI ankle without contrast (CPT®73721)

VII. Soft tissue mass including soft tissue sarcoma\(^{18-21}\) (MRI without and with contrast) [One of the following] Note: Plain x-rays are an important initial imaging study and often serve as a valuable complement to assessment with other imaging procedures.
   A. Nondiagnostic initial x-ray
   B. Suspected ganglion cyst with negative ultrasound, pain and a palpable lump that is solid on transillumination or does not respond to aspiration
   C. Soft tissue sarcoma of the extremity [One of the following]
      1. Initial staging of primary site
      2. Restaging:
         a. After preoperative radiotherapy and preoperative planning prior to resection
         b. After surgical resection
         c. After adjuvant radiotherapy
         d. Suspected local recurrence
         e. Every 2 cycles to assess response to chemotherapy for patients with measurable disease
      3. Surveillance:
a. Stage I and low grade – Every 6 months for 2 years, then annually to year 10
b. Stages II-IV and high grade – Every 3 months for 2 years, then every 6 months for 2 years, then annually
4. Suspicion of local recurrence

VIII. Septic joint and arthrocentesis is contraindicated or not diagnostic\(^22\) (Ultrasound or x-ray guided arthrocentesis) [Both of the following]
A. Symptoms [One of the following]
   1. Decreased range of motion
   2. Acute development of a hot swollen joint (<2 weeks)
B. Laboratory tests [One of the following]
   1. ESR >22 mm/hr
   2. Aural temperature >38.3°C or >100.9°F
   3. Leukocytosis, WBC >11,500/cu.mm
   4. C-reactive protein >10 mg/L

IX. Soft tissue abscess with negative ultrasound and tender or warm or erythematous area [One of the following]
A. Aural temperature >38.3°C or >100.9°F
B. Leukocytosis, WBC >11,500/cu.mm
C. ESR >22 mm/hr
D. C-reactive protein >10 mg/L

X. Foreign Body - CT without contrast or MRI without and with contrast of the area of interest can be approved after x-rays rule out the presence of radiopaque foreign bodies

XI. Gout - CT without contrast, or MRI without contrast, or MRI without and with contrast of the area of interest is indicated for soft tissue tophi, when infection or neoplasm is in the differential diagnosis

XII. Paget’s Disease
A. MRI (contrast as requested) can be considered if the diagnosis (based on x-rays and laboratory studies) is in doubt
B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected

XIII. Chondral/Osteochondral Lesions, Including Osteochondritis Dissecans and Fractures - X-rays are negative and an osteochondral fracture is still suspected, or if x-ray and clinical exam suggest an unstable osteochondral injury, either MRI without contrast, MRI with contrast (arthrogram), or CT with contrast (arthrogram) of the area of interest is indicated
References:

## 73725  MRA Lower Extremity

### I. Peripheral vascular disease with abnormal ankle brachial index as defined in A [AND one additional of the following] after failure of a minimum of 3 months of a physician directed walking exercise program 1-3

A. Note: For evaluation of PVD, if meets criteria for MRA abdomen, MRA lower extremity (one only) should be certified. An MRA of the pelvis or another lower extremity should NOT be certified. ABI (ankle brachial index, ankle systolic BP divided by brachial systolic BP) [One of the following]
1. Rest ABI <0.90 in symptomatic member
2. Exercise ABI <0.90 in symptomatic member with rest ABI >0.90
3. Toe brachial index <0.90 or pulse volume recording evidence of peripheral vascular disease if the ABI >1.30

B. Abnormal pulses
C. Bruit
D. Claudication

### II. Peripheral arterial vascular disease with abnormal ankle brachial index as defined above in A [AND one additional of the following]

A. Arteritis (Takayasu’s arteritis, giant cell arteritis) [One of the following]
1. ESR >22 mm/hr
2. Positive ANA
3. Positive RF or rheumatoid factor

B. Scleroderma
C. Hypercoagulable state [One of the following]
1. Antiphospholipid antibodies
2. Behçet’s syndrome
3. Protein C deficiency
4. Protein S deficiency
5. Factor V Leiden deficiency
6. Lupus anticoagulant
7. Hyperactive platelet syndrome
8. MRHFR
9. Anticardiolipin antibodies
10. Elevated homocysteine level
11. Anti B2 glycoprotein antibodies
12. Elevated fibrinogen
13. PTT abnormal
14. Antithrombin III antibodies
15. Oral contraceptive use
16. Hormone replacement
17. Sickle cell anemia
D. Buerger’s disease (thromboangiitis obliterans) [Both of the following]
   1. History of smoking
   2. Loss of pulses or decreased pulses in the lower extremity
E. Known atherosclerotic occlusive disease when catheter angiography fails to
demonstrate an occult runoff vessel suitable for vascular bypass

III. Known peripheral vascular disease with prior catheter
angiogram not demonstrating a viable runoff vessel for use in
surgical bypass

IV. Femoral or popliteal artery aneurysm
   A. Pulsatile mass
   B. CTA (CPT® 73706) or MRA (CPT® 73725) performed for:
      1. Preoperative study for patients with no plans for invasive angiography
      2. Technically limited or abnormal ultrasound results

V. Trauma (popliteal)
   A. Diminished peripheral pulses
   B. Suspected pseudoaneurysm

VI. Fibular transfer graft\textsuperscript{4,5}

VII. Venous aneurysm

VIII. Deep venous thrombosis (DVT)
   A. Venous Doppler non diagnostic

IX. Knee Joint Dislocation - following x-ray - -MRI knee without
contrast (CPT\textsuperscript{®}73721) and MRA knee without and with contrast
(CPT\textsuperscript{®}73725) following significant trauma to evaluate for
ligament and vascular injury

References:

1. Rooke TW, Hirsch AT, Misra S, et al. 2011 ACC/AHA update of the guideline for the management of
patients with peripheral arterial disease (updating the 2005 guideline).
74150  CT Abdomen without Contrast
74160  CT Abdomen with Contrast
74170  CT Abdomen with and without Contrast

Note: For radiation therapy planning, use 77014.
For CT guided needle placement, biopsy, or drainage, use 77012.
For CT guided tissue ablation, use 77013.

If there is a note next to an indication stating "See CT of the abdomen and pelvis, 74176, 74177, or 74178," please refer to CPT codes 74176, 74177, and 74178.

I. Complaints associated with abdominal or pelvic pain\textsuperscript{1-11} (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

II. Evaluation of symptoms after any abdominopelvic surgery\textsuperscript{1} (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

III. Abdominal Aortic Aneurysm (AAA)\textsuperscript{116-118}
   A. For non-obese patients, ultrasound (CPT\textsuperscript{®} 76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass
   B. For obese patients, CT abdomen and Pelvis with contrast (CPT\textsuperscript{®} 74177) can be substituted for US using the same timeline as non-obese patient
   C. One-time screening recommendations for AAA (Ultrasound CPT\textsuperscript{®} 76775):
      1. Men age 65 to 75 who have smoked
      2. Women and non-smokers – no routine screening
      3. Medicare covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
         a. Family history of AAA
         b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime
   D. Surveillance recommendations for AAA (Ultrasound CPT\textsuperscript{®} 76775):
      1. 2.6-2.9 cm \(\rightarrow\) once at 5 years
      2. 3.0-3.4 cm \(\rightarrow\) once at 3 years
      3. 3.5-4.4 cm \(\rightarrow\) annually
      4. 4.5-5.4 cm \(\rightarrow\) every 6 months
   E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or at least 1 cm in a year may undergo more frequent monitoring and should be evaluated by a Vascular Specialist
   F. Preoperative imaging if endovascular or open repair of AAA is being considered (CPT\textsuperscript{®} 74177, 74178, 74175 or 72191)
   G. New onset of back and/or abdominal pain in a patient with a known AAA (CPT\textsuperscript{®} 74177, 74178, 74175 or 72191)
   H. Post Open Aortic Repair: (CPT\textsuperscript{®} 74160 or 74170)
1. Every 3 years to screen for aneurysms in the remaining aorta

I. Post Endovascular (Stent) Aortic Repair: (CPT® 74160 or 74170)
   1. 1 month
   2. 3 months if there was evidence of endoleak on the 1 month study
   3. 6 months
   4. 12 months
   5. Every year

IV. Obstruction of bowel21-23 (See CT of the abdomen and pelvis, 74176, 74177, or 74178) Known or acute suspected pancreatitis with abdominal pain or pancreatic pseudocyst57-59 [One of the following]
   A. Suspected acute pancreatitis with abdominal pain. [One of the following]
      1. Initial scan [One of the following]
         a. Amylase > 3 times the upper normal laboratory value
         b. Lipase > 3 times the upper normal laboratory value
         c. Red Flag Signs
         d. Mass
         e. No improvement with medical therapy
         f. Suspected complications including peripancreatic effusions, pseudocysts, abscess, and pancreatic necrosis
      2. Initial scan at onset of abdominal pain but serum amylase and lipase are not > 3 times normal but with severe abdominal pain and epigastric pain that increases rapidly in severity and persists without any relief.
      3. Suspected pancreatitis and ultrasound findings do not explain symptoms (gallstones, common duct, etc)
      4. Follow up scan 7 – 21 days after onset of symptoms with a confirmed diagnosis
      5. MRI without and with contrast2 (CPT® 74183) is considered if:
         a. CT is contraindicated and CT indications met or equivocal
      6. MR cholangiopancreatography1,2 can be considered if:
         a. Suspected gallstone pancreatitis to screen for those patients who would benefit from ERCP
         b. Recurrent, acute pancreatitis with no known cause
         c. Evaluation of patients with suspicion of pancreatic ductal anomalies that may predispose patients to pancreatitis
         d. Plain abdominal X-ray (KUB) and ultrasound (CPT® 76700 or CPT® 76705) are not characteristic and diagnostic in known chronic pancreatitis and findings will affect management decisions
   B. Known pancreatitis with any of the following allows for repeat exams if present [One of the following]
      1. Hemodynamic instability
         a. Falling hematocrit
         b. Falling blood pressure
      2. Aural temperature > 38.3°C or > 100.9°F
      3. White blood cell count or leukocytosis of > 12,000 cells/mm³
4. White blood cell count < 4,000 cells/mm³
5. Retroperitoneal air on prior CT
6. Positive blood culture
7. Signs of peritonitis (rebound, or guarding, or tenderness)
8. Poor oxygen saturation, signs of ARDS (adult respiratory distress syndrome)
9. Signs of renal failure rising BUN and creatinine

C. Suspected pancreatic pseudocyst [Both of the following]
   1. History [One of the following]
      a. Acute pancreatitis with onset at least 4 weeks earlier
      b. Pancreatitis secondary to trauma (time irrelevant)
      c. Chronic pancreatitis
   2. Clinical findings [One of the following]
      a. Abdominal/back pain
      b. Abdominal tenderness
      c. Abdominal mass

D. Pancreatic Pseudocysts¹¹⁹-¹²⁰
   1. CT of the abdomen with contrast (CPT® 74160), or without and with contrast (CPT® 74170)¹,² or abdominal MRI without and with contrast (CPT® 74183)
      a. Minimal symptoms - every two weeks, up to six weeks total.
         Thereafter, every 4 weeks.
      b. Anytime symptoms worsen, including development of ascites or pleural effusion, increasing serum amylase, or if drainage of the cyst is planned

V. Chronic pancreatitis with history of recurrent pancreatitis and abdominal pain and no definitive diagnosis with ultrasound or endoscopic ultrasound (not helpful for early diagnosis; only confirmation of diagnosis and surgical planning)⁶⁰,⁶¹

VI. Pancreatic mass³²-³⁵
   Once diagnosis of pancreatic cancer established, See CT of the abdomen and pelvis, 74176, 74177, or 74178, and section XXXIV for imaging recommendations.
   A. Suspected diagnosis of pancreatic cancer based on one of the following:
      1. Symptoms [One of the following]
         a. Weight loss (See XIX below)
         b. Mid-epigastric pain radiating to the back
         c. Painless jaundice (see XV below)
      2. Elevated tumor markers [One of the following]
         a. CA19-9 >35 IU/L
         b. CEA >2.5 in a non-smoker
         c. CEA >5.0 in a smoker
      3. Pancreatic mass on recent prior imaging and request for “pancreatic protocol”
4. Prior imaging with dilatation of the bile duct and/or pancreatic duct (US, ERCP, MRCP)

B. **Screening patients at high risk of pancreatic cancer** (to begin at age 40 or 10 years younger than the youngest affected family member) with any one of the following risk factors:
   1. Family history of familial cancer syndromes (one of the following):
      a. Peutz-Jeghers Syndrome
      b. Hereditary Breast and Ovarian Cancer Syndrome
      c. Familial Atypical Multiple Mole-Melanoma Syndrome (FAMMM)
      d. Familial Adenomatous Polyposis
   2. Hereditary pancreatitis
   3. Familial pancreatic cancer (one of the following)
      a. Two or more first degree relatives
      b. Any combination of 3 or more first/second degree relatives
   4. Hereditary pancreatic neuroendocrine tumors such as:
      a. Multiple Endocrine Neoplasia Type I [MEN-1]
      b. von Hippel-Lindau disease
      c. Neurofibromatosis Type 1
      d. Tuberous sclerosis

VII. **Pancreatic Lesion (Incidental Pancreatic Cyst)**

A. Abdominal CT (CPT® 74170) preferably, thin slice or MRI with and without contrast (CPT® 74183) for any of the following:
   1. Every 12 months after the initial incremental finding if <1cm in size
   2. Every 6 to 12 months after the initial finding if 1-2 cm in size
   3. Every -6 months after the initial finding if greater than 2 cm in size

B. The following lesions should be evaluated by endoscopic ultrasound (EUS) and MRCP
   1. Pancreatic lesions >3 cm; or,
   2. Pancreatic lesions of any size with concerning features (mural nodules, dilated duct, pain, positive cytology, jaundice, worsening diabetes, etc.).

C. Imaging for the evaluation of pancreatic cystic lesions should be MRI Abdomen (CPT® 74183) and/or MRCP due to its ability to better characterize the relationship of the cyst to the pancreatic duct. If a previous US or CT Abdomen has been performed, a request for an MRI can be approved to better characterize the lesion, without reference to the timeframe for follow-up imaging.
VIII. Known or suspected adrenal disease or mass including adrenal carcinoma⁴⁷, ⁶²-⁶⁶ [One of the following]

A. Pheochromocytoma/paraganglioma

CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:

1. Suspected pheochromocytoma or paraganglioma (one of the following)
   a. Fractionated metanephrines in plasma > 3-4 times the upper laboratory limit
   b. 24 hour urinary total metanephrine > 1800µg
   c. Clonidine suppression test positive (plasma norepinephrine is > 500pg/ml or > 2.96nmol/L or < 50% decrease in plasma norepinephrine) if fractionated metanephrines are above normal but less than 4 times the upper limit of normal
   d. Suspicion of pheochromocytoma in individual with MEN2, von Hippel-Lindau syndrome and neurofibromatosis type 1 (NF-1) if the blood and urine tests are not abnormal

2. Initial staging of newly diagnosed pheochromocytoma

3. Monitoring response to treatment for unresectable or metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months

4. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers

5. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

B. Adrenocortical carcinoma

CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:

1. Initial staging

2. Monitoring response to treatment for unresectable or metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months

3. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers

4. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

C. Functional Adrenal Tumors

CT Abdomen with contrast (CPT® 74160) may be obtained for one of the following:

1. Suspected Cushing’s syndrome [One of the following]
   a. 24 hour urine free cortisol > 100 mcg/24 hr
   b. No suppression by dexamethasone
2. Suspected aldosteronoma or primary aldosteronism or Conn's syndrome
[One of the following]
   a. Hypertension that is drug resistant (need for > 3 drugs)
   b. Spontaneous (<3.5 mEq/L) or severe diuretic-induced (< 3 mEq/L) hypokalemia
   c. Plasma aldosterone to renin ratio > 10 when aldosterone is measured in ng/dL
   d. 24 hour urinary aldosterone excretion test > 14µg/day

D. Incidental Adrenal lesion
   To evaluate incidental finding on other imaging such as CT or MRI scan performed for other purposes (CT or MRI of the chest or heart), or US with no history of malignancy [One of the following]
   1. Asymptomatic adrenal mass >1 cm
      a. No further imaging, regardless of size, if imaging is diagnostic for benign findings, including any of the following:
         i. Myelolipoma (macroscopic fat) or
         ii. Calcified mass or
         iii. < 10 HU on CT or decreased signal on Chemical Shift MRI (CS-MRI) consistent with benign adenoma, or
         iv. If imaging was completed with and without contrast and enhancement (defined as < 10 HU change between unenhanced and enhanced/contrasted CT scan e.g. cyst,hemorrhage).
   2. Asymptomatic adrenal mass 1 to < 4 cm with indeterminate imaging on any CT or MRI and no prior imaging for comparison:
      a. 1 to 2 cm:
         i. 12 month CT Abdomen without and with contrast imaging (adrenal protocol) or may consider CS-MRI (chemical shift MRI), especially if CT contraindicated
         ii. If stable ≥ 1 year, no further imaging-likely benign
      b. > 2 cm to < 4 cm:
         i. CT Abdomen without and with contrast (adrenal protocol); may consider CS-MRI (chemical shift MRI), especially if CT Contraindicated
         ii. No further follow up imaging if:
             01. Absolute Percentage Washout/Relative Percentage Washout (APW/RPW) > 60/40% Benign adenoma;
             02. No enhancement (defined as change in pre- and post-contrast imaging of <10 HU Cyst or hemorrhage
         iii. If APR/RPW <60/40%:
             01. Consider 6-12 month follow up imaging, or
             02. Resection for possible primary adrenocortical carcinoma, with biochemical evaluation to determine functional status and to exclude pheochromocytoma prior to resection
03. If not resected, follow-up CT abdomen with and without contrast (or CS-MRI) in 6 – 12 months. May consider CS-MRI (chemical shift MRI), especially if CT contraindicated
   a. If enlarging on follow-up imaging: Consider resection for possible primary adrenocortical carcinoma; biochemical evaluation to determine functional status and to exclude pheochromocytoma prior to resection.

3. No history of cancer or > 10 HU on NCCT and Asymptomatic adrenal mass ≥ 4 cm with indeterminate imaging on any CT or MRI:
   a. Biochemical assays to determine functional status to exclude pheochromocytoma prior to resection
   b. Consider resection for possible primary adrenocortical carcinoma

E. To evaluate incidental finding on other imaging such as CT or MRI scan performed for other purposes (CT or MRI of the chest or heart), or US WITH history of malignancy [One of the following]
   1. 1 cm to < 4 cm with indeterminate imaging on any CT or MRI and no prior imaging for comparison
      a. CT abdomen without and with contrast or May consider CS-MRI (chemical shift MRI), especially if CT contraindicated
      b. No further follow-up imaging if:
         i. APW/RPW > 60/40%; Benign adenoma; OR
         ii. No enhancement (defined as change in pre- and post-contrast imaging of <10 HU e.g. cyst or hemorrhage);
      c. APW/RPW < 60/40%:
         i. PET CT; consider biopsy;
         ii. Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection.
      d. If enlarging or new lesion:
         i. PET CT or biopsy;
         ii. Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection.
   2. ≥ 4 cm and Indeterminate imaging features on any CT or MRI
      a. PET CT or biopsy
      b. Consider biochemical assays to determine functional status and exclude pheochromocytoma prior to biopsy/resection

F. Polycystic Ovary Syndrome
   1. If elevated serum levels of androgens is found and an adrenal etiology is suspected, the initial study is CT Abdomen CT without contrast (CPT®74150). If this initial CT is indeterminate, non-diagnostic, or concerning for malignancy, CT Abdomen with (bolus arterial phase), contrast (CPT®74160) can be considered.

IX. Splenomegaly with LUQ pain

X. Indeterminate liver mass on recent ultrasound, refer to MRI of the abdomen with and without contrast (CPT®74183)

XI. New renal mass suspected or detected on prior imaging (For renal cell cancer, see XL below) [One of the following]
A. Clarification of findings on prior imaging ultrasound or CT and request is for “renal protocol”

B. Cystic or solid mass detected on ultrasound
   1. Simple cyst confirmed on prior CT to be simple cyst or Bosniak class I cyst
      – no further imaging is indicated

C. Bosniak class II cyst on prior CT (or MRI)
   1. CT may be certified every 6 months for 3 years and if stable no further imaging

XII. Jaundice121-122
A. Ultrasound (CPT® 76700 or CPT® 76705) is the preferred initial imaging study to visualize the biliary ductal system when pain is present. Ultrasound often demonstrates the level and cause of any obstruction.
B. Abdomen CT without and with contrast (CPT® 74170) or Abdomen CT with contrast (CPT® 74160) should be considered in the following scenarios:
   1. If non-diagnostic or equivocal ultrasound (e.g., large amounts of intestinal gas)
   2. Patient is obese
   3. Painless jaundice
   4. Acute abdominal pain and one of the following:
      a. Fever
      b. Previous biliary surgery
      c. Known cholelithiasis
   5. If there is high pretest probability of obstruction due to malignancy
C. MR Cholangiopancreatography (MRCP) may be used to assess the extent and cause of intrahepatic bile duct obstruction
   1. Suggested by either ultrasound or CT if further characterization is warranted.
   2. Contraindications to the use of IV contrast for CT imaging

XIII. Fever of unknown origin (FUO)70,71 (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

XIV. Abdominal and pelvic trauma72-74 Ultrasound (CPT® 76700 and/or CPT® 76856) should be used initially for trauma with low probability of intra-abdominal injury (minimal pain, no evidence of peritoneal irritation on physical examination, no hemodynamic instability, no elevated AST/ALT).)
   [One of the following]
A. In patients with BMI > 35, ultrasound imaging may be suboptimal and CT Abdomen and Pelvis with contrast may be performed.
B. To determine whether individuals need hospitalization for observation as a result of blunt renal trauma with hematuria, CT Abdomen and Pelvis without and with contrast (CPT® 74178) should be used initially.
C. CT Abdomen and/or Pelvis with contrast (CPT® 74160, or CPT® 72193, or CPT® 74177):
   1. High probability intra-abdominal injury
   2. Seat belt sign
3. Rebound tenderness or guarding
4. Hypotension
5. Abdominal distension
6. Concomitant femur fracture (may indicate blunt abdominal trauma in patients struck by automobiles)

D. If ultrasound demonstrates any positive finding(s)

XV. Weight loss\textsuperscript{75} (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

XVI. Hematuria\textsuperscript{3} (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

XVII. CT enterography\textsuperscript{9,76-79} (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

XVIII. Evaluation of Chronic Liver Disease, regardless of etiology\textsuperscript{80-84}

[One of the following]
A. Ultrasound demonstrating a liver mass greater than or equal to 1 cm
   1. Multiphase CT (either CPT\textsuperscript{®} 74160 or CPT\textsuperscript{®} 74170)\textsuperscript{9} or MRI (CPT\textsuperscript{®} 74183) should be performed
   2. If not characteristic of HCC, repeat (CT or MRI) or consider biopsy.
   3. If second advanced imaging is not diagnostic – then consider biopsy.
B. Advanced imaging may be appropriate if the US is technically limited by such factors as obesity, intestinal gas, or chest wall deformity.
C. For negative US with AFP > 20 AND a > 2X increase in AFP from the previous low point within the past year:
   1. MRI abdomen (CPT\textsuperscript{®} 74183) or CT abdomen (CPT\textsuperscript{®} 74170) can be approved, and if negative for a hepatic lesion, follow-up imaging resumes with US, unless further increases in AFP are documented
   D. Planned TIPS (transjugular intrahepatic portosystemic shunt – relatively non-invasive procedure for portal hypertension)

XIX. Known or suspected metastatic disease to the liver
Either, CT Abdomen without and with contrast (CPT\textsuperscript{®} 74170) or MRI of the Abdomen (CPT\textsuperscript{®} 74183) may be obtained for one of the following:

1. Inconclusive CT findings
2. New liver lesion(s) and primary site controlled
3. Considering limited resection
4. Monitoring of ablated metastases
   a. Immediately prior to ablation
   b. One month post ablation
   c. Every 3 months for 2 years then annually thereafter

XX. Head and Neck Cancers
A. \textbf{CT scan Abdomen} (CPT\textsuperscript{®} 74160) or CT scan Abdomen and Pelvis (CPT\textsuperscript{®} 74177) is not routinely indicated for evaluation of head and neck cancer, but may be obtained in specific situations.
B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Signs or symptoms of abdominal metastatic disease
   2. Elevated LFTs
C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Squamous cell carcinoma found within lower neck nodes from an unknown primary site
   2. Prior involvement of pelvis with cancer
   3. New/worsening signs or symptoms related to the pelvis

XXI. Salivary Gland Cancers
A. CT scan Abdomen or CT scan Abdomen and Pelvis is not routinely indicated for evaluation of salivary gland cancer, but may be obtained in specific situations.
B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Signs or symptoms of abdominal metastatic disease
   2. Elevated LFTs
C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in B. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

XXII. Thyroid Cancer
A. CT scan Abdomen or CT scan Abdomen and Pelvis is not routinely indicated for evaluation of thyroid cancer, but may be obtained in specific situations.
B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Initial staging of Medullary thyroid cancer for one of the following:
      a. Positive lymph nodes
      b. Serum Calcitonin level >500 pg/mL
   2. Suspected recurrence of Medullary thyroid cancer and one of the following:
      a. Elevated serum Calcitonin
      b. Elevated CEA
      c. Elevated LFTs
      d. Signs or symptoms of abdominal metastatic disease
C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging of Anaplastic thyroid cancer
   2. Suspected recurrence of Anaplastic thyroid cancer
   3. Surveillance of Anaplastic thyroid cancer – every 3 months for 2 years
XXIII. Thymoma and Thymic Carcinoma
A. CT scan Abdomen or CT scan Abdomen and Pelvis is not routinely indicated for evaluation of thymic carcinoma, but may be obtained in specific situations.
B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Initial staging of thymoma and thymic carcinoma when extensive mediastinal involvement is noted on CT chest
   2. Suspected recurrence of thymoma and thymic carcinoma when extensive mediastinal involvement is noted on CT chest
   3. Monitoring response to chemotherapy, for known abdominal metastatic disease – every 2 cycles (6 to 8 weeks)
   4. Surveillance – CT scan is not indicated for routine surveillance in asymptomatic individuals
C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in B. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

XXIV. Non-small cell Lung Cancer
A. CT scan Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment for locally advanced, unresectable or metastatic lung cancer
      a. Receiving chemotherapy – Every 2 cycles (6 to 8 weeks)
      b. Receiving maintenance therapy or immunotherapy – Every 3 months
   3. To establish a post-treatment baseline, after completion of chemotherapy, radiation therapy or surgery
   4. Recurrence suspected or biopsy proven
   5. Surveillance – CT scan abdomen is not indicated for routine surveillance in asymptomatic individuals
B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

XXV. Small Cell Lung Cancer
A. CT scan Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
   1. Monitoring response to chemotherapy for locally advanced, unresectable or metastatic cancer – Every 2 cycles (6 to 8 weeks)
   2. To establish a post-treatment baseline, after completion of chemotherapy, radiation therapy or surgery
   3. Recurrence suspected or biopsy proven
4. Surveillance – CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen without contrast (CPT® 74150) may be obtained every 4 months for the first 2 years, then every 6 months for 3 additional years and then annually

B. **CT Abdomen and Pelvis with contrast** (CPT® 74177) may be obtained for one of the following:
   1. Initial staging of newly diagnosed small cell lung cancer

C. **CT Abdomen and Pelvis with contrast** (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
   a. Prior involvement of pelvis with cancer
   b. New/worsening signs or symptoms related to the pelvis

**XXVI. Malignant Mesothelioma**

Malignant Pleural Mesothelioma:

A. **CT scan Abdomen with contrast** (CPT® 74160) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to chemotherapy for locally advanced, unresectable disease - Every 2 cycles (6 to 8 weeks)
   3. To establish a post-treatment baseline, after completion of induction chemotherapy and prior to surgical resection
   4. Recurrence suspected or biopsy proven
   5. Surveillance – CT scan abdomen is not indicated for routine surveillance in asymptomatic individuals

B. **CT Abdomen and Pelvis with contrast** (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

Primary Peritoneal Mesothelioma:

C. **CT Abdomen and Pelvis with contrast** (CPT® 74177) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to chemotherapy – every 2 cycles (6 to 8 weeks)
   3. Suspected recurrence
   4. Surveillance – every 3 months for 2 years, and annually thereafter

**XXVII. Neuroendocrine tumors (low-grade)**

Neuroendocrine tumors (NET) can arise from gastrointestinal, lung, thymus, pancreatic or adrenal primary sites and may have elevation of various tumor markers such as chromogranin A, 5HIAA, insulin, VIP, glucagon, gastrin, substance P, serotonin, somatostatin.

Depending on the site of origin, either CT scan Abdomen with contrast (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) would be the preferred test to evaluate.
A. Bronchopulmonary carcinoid or thymic NET
CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
1. Suspected diagnosis
   a. Elevated urine 5HIAA >15mg/24hr
   b. Elevated chromogranin A (CgA) >39ng/L
   c. Elevated substance P >270 ng/L or pg/mL
   d. Elevated gastrin >100pg/mL
   e. Elevated serotonin >330mcmol/L
2. Initial staging
3. Monitoring response to treatment for known abdominal metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months
4. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers
5. Surveillance – CT Abdomen and Pelvis is not routinely indicated for surveillance of asymptomatic individuals

B. Gastric/duodenal/jejunal/ileal/appendiceal/pancreatic NET
CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
1. Suspected diagnosis of Carcinoid syndrome (one of the following)
   a. Elevated urine 5HIAA >15mg/24hr
   b. Elevated chromogranin A (CgA) >39ng/L
   c. Elevated substance P >270 ng/L or pg/mL
   d. Elevated gastrin >100pg/mL
   e. Elevated serotonin >330mcmol/L
2. Suspected Gastrinoma or Zollinger-Ellison syndrome (one of the following)
   a. Elevated serum gastrin >100pg/m
   b. Positive secretin test
3. Suspected Insulinoma (one of the following)
   a. Elevated serum C peptide
   b. Fasting blood glucose of <40mg/dL
   c. Elevated serum insulin >2.0ng/ml
4. Suspected Glucagonoma (one of the following)
   a. Elevated serum glucagon >100pg/ml
5. Suspected VIPoma (one of the following)
   a. Elevated vasoactive intestinal polypeptide (VIP) >70pg/ml
6. Suspected Somatostatinoma (one of the following)
   a. Elevated somatostatin
7. Initial staging of newly diagnosed Neuroendocrine tumor
8. Monitoring response to treatment for unresectable or metastatic disease:
a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
b. Patients receiving somatostatin analogues – every 3 months

9. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers

10. Surveillance:
   a. NET of small and large bowel - CT Abdomen and Pelvis with contrast (CPT® 74177) once at 3-12 months post-operatively, and then annually for 10 years
   b. NET of pancreas or stomach - CT Abdomen with contrast (CPT® 74160) once at 3-12 months post-operatively, and then annually for 10 years

C. Pheochromocytoma/paraganglioma
   CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
   1. Suspected pheochromocytoma or paraganglioma (one of the following)
      a. Fractionated metanephrines in plasma > 3-4 times the upper laboratory limit
      b. 24 hour urinary total metanephrine >1800µg
      c. Clonidine suppression test positive (plasma norepinephrine is > 500pg/ml or > 2.96nmol/L or < 50% decrease in plasma norepinephrine) if fractionated metanephrines are above normal but less than 4 times the upper limit of normal
      d. Suspicion of pheochromocytoma in individual with MEN2, von Hippel-Lindau syndrome and neurofibromatosis type 1 (NF-1) if the blood and urine tests are not abnormal
   2. Initial staging of newly diagnosed pheochromocytoma
   3. Monitoring response to treatment for unresectable or metastatic disease:
      a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
      b. Patients receiving somatostatin analogues – every 3 months
   4. Suspected recurrence based on one of the following:
      a. New symptoms
      b. Rising tumor markers
   5. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

D. Adrenocortical carcinoma
   CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment for unresectable or metastatic disease:
      a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
      b. Patients receiving somatostatin analogues – every 3 months
   3. Suspected recurrence based on one of the following:
a. New symptoms
b. Rising tumor markers
4. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

XXVIII. Extrathoracic Small Cell Carcinoma (High grade Neuroendocrine carcinoma) – (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

XXIX. Esophageal cancer
A. CT scan Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to chemotherapy for locally advanced, unresectable disease - Every 2 cycles (6 to 8 weeks)
   3. To establish a post-treatment baseline, after completion of primary chemotherapy and/or radiation therapy and prior to surgical resection
   4. Recurrence suspected or biopsy proven
   5. Surveillance
      a. Stage 0 - I – no routine advanced imaging is indicated
      b. Stage II - III – CT scan Abdomen with contrast (CPT® 74160) every 6 months for 3 years
      c. Stage IV with measurable abdominal metastases – every 3 months for 5 years
B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

XXX. Gastric Cancer
A. CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
   1. Initial staging
   2. To establish a post-treatment baseline, after completion of chemotherapy and/or radiation therapy and prior to surgical resection
   3. Surveillance:
      a. Stage I (treated with resection alone)
         i. No routine imaging unless clinical signs/symptoms of recurrence
      b. Stage I treated with systemic therapy, Stages II-III and Stage IV - Metastatic disease (post definitive treatment of all measurable disease or being observed off therapy)
         i. CT Abdomen/Pelvis with contrast (CPT® 74177) annually for 5 years
B. **CT scan Abdomen with contrast** (CPT® 74160) or CT scan Abdomen without and with contrast (CPT® 74170) may be obtained for one of the following:
   1. Recurrence – suspected or biopsy proven
   2. New liver lesions with primary site controlled
   3. Surveillance – CT Abdomen is not routinely indicated for surveillance of asymptomatic individuals

XXXI. **Hepatoma or Hepatocellular Carcinoma**
   1. Any ONE of the following studies may be obtained for evaluation of hepatocellular carcinoma for any indication listed below:
      a. CT Abdomen and Pelvis with contrast (CPT® 74177)
      b. CT Abdomen and Pelvis without and with contrast (CPT® 74178)
      c. CT scan Abdomen with contrast (CPT® 74160)
      d. CT scan Abdomen without and with contrast (CPT® 74170)
      e. MRI Abdomen without and with contrast (CPT® 74183) and MRI Pelvis without and with contrast (CPT® 72197)
   2. Initial staging
   3. After completion of initial therapy
   4. Monitoring response to treatment
      a. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
      b. Patients receiving immunotherapy – every 3 months
      c. Immediately prior to and 1 month post-ablation
   5. For suspected recurrence
      a. New signs or symptoms
      b. New liver lesions
      c. Rising LFTs or AFP
   6. Surveillance – every 3 months for 2 years, and then annually thereafter

XXXII. **Gall Bladder Cancer and Cholangiocarcinoma**
   A. **CT scan Abdomen with contrast** (CPT® 74160) or CT scan Abdomen without and with contrast (CPT® 74170) may be obtained for one of the following:
      1. Initial staging
         CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may also be approved for this indication.
      2. After completion of initial chemotherapy to establish post-treatment baseline
      3. For suspected recurrence
         a. New signs or symptoms
         b. New liver lesions
         c. Rising LFTs
      4. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks)
   B. Surveillance – every 6 months for 2 years and then annually up to 5 years
CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
1. Prior involvement of pelvis with cancer
2. New/worsening signs or symptoms related to the pelvis

XXXIII. Pancreatic Cancer

A. CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen without and with contrast (CPT® 74170) may be obtained for one of the following:
1. Screening patients at high risk of pancreatic cancer (to begin at age 40 or 10 years younger than the youngest affected family member) with any one of the following risk factors:
   a. Family history of familial cancer syndromes (including Peutz-Jeghers Syndrome, Hereditary Breast and Ovarian Cancer Syndrome, Familial Atypical Multiple Mole-Melanoma Syndrome (FAMMM), Familial Adenomatous Polyposis)
   b. Hereditary pancreatitis
   c. Familial pancreatic cancer ((two or more first degree relatives or any combination of 3 or more first/second degree relatives)
   d. Hereditary pancreatic neuroendocrine tumors (Multiple Endocrine Neoplasia Type I [MEN-1], von Hippel-Lindau disease, neurofibromatosis Type 1, tuberous sclerosis)
2. Suspected diagnosis of pancreatic cancer based on symptoms, abnormal labs or physical exam findings or abnormal US/ERCP

B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
1. Initial staging of newly diagnosed pancreatic cancer
2. After completion of neoadjuvant chemotherapy or definitive chemotherapy and/or radiation therapy to establish a new post-treatment baseline
3. Monitoring response to chemotherapy in locally advanced/unresectable disease – Every 2 cycles (6 to 8 weeks)
4. For suspected recurrence
   a. New signs or symptoms
   b. New liver lesions
   c. Rising LFTs or tumor markers
5. Surveillance – every 3 months for 2 years and then annually thereafter

XXXIV. Colon Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

XXXV. Rectal Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

XXXVI. Anal Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)
XXXVII. Bone Cancer

Osteosarcoma
A. CT Abdomen (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) is not routinely indicated for evaluation of osteosarcoma, but can be approved for one of the following:
   1. Primary site of abdomen or pelvis
   2. Evaluation of inconclusive findings on other imaging studies, such as PET
   3. New signs or symptoms related to the abdomen and/or pelvis

Ewing’s sarcoma
B. CT Abdomen (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) is not routinely indicated for evaluation of osteosarcoma, but can be approved for one of the following:
   1. Primary site of abdomen or pelvis
   2. Evaluation of inconclusive findings on other imaging studies, such as PET
   3. New signs or symptoms related to the abdomen and/or pelvis

Chondrosarcoma
C. CT Abdomen (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) is not routinely indicated for evaluation of osteosarcoma, but can be approved for one of the following:
   1. Primary site of abdomen or pelvis
   2. Evaluation of inconclusive findings on other imaging studies, such as PET
   3. New signs or symptoms related to the abdomen and/or pelvis

Chordoma
D. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to chemotherapy – only if abdomen/pelvis previously involved with disease – every 2 cycles (6 to 8 weeks)
   3. Surveillance - CT scan Abdomen with contrast (CPT® 74160) annually for 10 years

XXXVIII. Soft tissue Sarcoma (See CT abdomen and pelvis, 74176, 74177, or 74178)

XXXIX. Gastrointestinal Stromal Tumor (GIST) (See CT abdomen and pelvis, 74176, 74177, or 74178)

XL. Melanoma (See CT abdomen and pelvis, 74176, 74177, or 74178)

XLI. Ocular melanoma
A. Initial staging (See CT of the abdomen and pelvis, 74176, 74177, or 74178)
B. Surveillance imaging after completion of therapy CT of the abdomen every 6 months for 2 years, then annually for another 3 years
XLII. Merkel Cell Carcinoma (See CT abdomen and pelvis, 74176, 74177, or 74178)

XLIII. Breast Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

XLIV. Renal cell or Kidney carcinoma

A. CT Abdomen and Pelvis with contrast (CPT® 74177) be obtained for one of
the following:
1. Initial staging
2. Monitoring response to treatment only for known metastatic disease:
   a. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
   b. Patients receiving immunotherapy – every 3 months
3. Suspected recurrence
4. Surveillance of metastatic cancer with persistent measurable disease, not
   on treatment – every 3 months

B. CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen
   without contrast (CPT® 74150) may be obtained for Surveillance, for one of
   the following:
1. Active surveillance (no treatment)
   a. Once within 6 months of initiation of surveillance (either CT or MRI can
      be approved for this indication, contrast as requested)
   b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775)
      annually for 5 years, CT abdomen or MRI may be obtained only for:
      i. New or worsening abdominal signs/symptoms
      ii. New or worsening ultrasound abnormalities
2. Stage I/II cancer treated with Ablation therapy
   a. Once within 3-6 months post-ablation (either CT or MRI may be
      obtained for this indication)
   b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775)
      annually for 5 years, CT or MRI abdomen may be obtained only for:
      i. New or worsening abdominal signs/symptoms
      ii. New or worsening ultrasound abnormalities
      iii. Suspicious abnormality on post-ablative CT scan
3. Stage I cancer treated with partial or complete nephrectomy
   a. Once within 3-12 months post-resection
   b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775)
      annually for 3 years, CT or MRI abdomen may be obtained only for:
      i. New or worsening abdominal signs/symptoms
      ii. New or worsening ultrasound abnormalities
      iii. Suspicious abnormality on post-operative CT scan
4. Stage II cancer treated with nephrectomy
   a. Once within 3-6 months post-resection
   b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775) every
      6 months for 3 years, then annually for 2 more years. CT or MRI
      abdomen may be obtained only for:
      i. New or worsening abdominal signs/symptoms
ii. New or worsening ultrasound abnormalities
iii. Suspicious abnormality on post-operative CT scan

5. Stage III cancer treated with nephrectomy
   a. CT Abdomen within 3 to 6 months post-resection, then every 3 months
      for 3 years, then annually up to year 5

6. Stage IV/Metastatic cancer with no measurable disease
   a. CT Abdomen within 3 to 6 months post-resection, then every 3 months
      for 3 years, then annually up to year 5

XLV. Transitional cell cancer [arising from the bladder, ureters, prostate, urethra and renal pelvis] (See CT abdomen and pelvis, 74176, 74177, or 74178)

XLVI. Prostate Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

XLVII. Testicular Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

XLVIII. Ovarian Germ Cell tumors (See CT abdomen and pelvis, 74176, 74177, or 74178)

XLIX. Extragonadal Germ Cell tumors (See CT abdomen and pelvis, 74176, 74177, or 74178)

L. Ovarian Epithelial cancer, fallopian tube cancer and primary peritoneal cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

LI. Cervical Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

LII. Uterine Cancer (See CT abdomen and pelvis, 74176, 74177, or 74178)

LIII. Squamous cell cancer of the external genitalia (vulva, vagina and penis) (See CT abdomen and pelvis, 74176, 74177, or 74178)

LIV. Leukemias (See CT abdomen and pelvis, 74176, 74177, or 74178)

LV. Non-Hodgkin’s lymphoma (See CT abdomen and pelvis, 74176, 74177, or 74178)

LVI. Hodgkin’s lymphoma (See CT abdomen and pelvis, 74176, 74177, or 74178)
LVII. Hematopoietic Stem Cell transplantation (See CT abdomen and pelvis, 74176, 74177, or 74178)
LVIII. Metastatic Cancer from an Unknown Primary site (See CT abdomen and pelvis, 74176, 74177, or 74178)
LIX. Follow up of renal abscess
LX. Pyelonephritis not responding to treatment88 (See CT abdomen and pelvis, 74176, 74177, or 74178)
LXI. Abscess1,5,9 (In some cases, See CT of the abdomen and pelvis, 74176, 74177, or 74178)
LXII. Spigelian, Ventral, Umbilical, or Incisional Hernia105-111 [CPT® 74150 or 74160]
   A. Known or suspected primary or recurrent Spigelian hernia (anterior abdominal wall hernia through the semilunar line), ventral hernia, umbilical, or incisional hernia
LXIII. Suspected or known dissection of the aorta92-93 (CTA of the abdomen and pelvis, 74174)
LXIV. Crohn’s disease and inflammatory bowel disease9,79,80 (See CT of the abdomen and pelvis, 74176, 74177, or 74178)
LXV. Appendicitis6,7 (In children and pregnant women, ultrasound as the initial study except for follow up of known appendicitis with suspected complications. If this is not possible then, see CT of the abdomen and pelvis, 74176, 74177, or 74178. MRI abdomen, 74181, 74182, or 74183 in pregnant women.)
LXVI. Diverticulitis, suspected or known in a patient with lower abdominal pain and/or mass4,5 (See CT of the abdomen and pelvis, 74176, 74177, or 74178)
LXVII. Kidney or renal stones2 (See CT of the abdomen and pelvis, 74176, 74177, or 74178)
LXVIII. Abdominal distention on physical examination (See CT of the abdomen and pelvis, 74176, 74177, or 74178)
LXIX. Evaluation of elevated liver function tests94-95 [One of the following]
   A. Ultrasound not diagnostic [One of the following]
      1. Direct bilirubin > .2
      2. Total bilirubin > 1.9
      3. Alkaline phosphatase > 147IU/L
4. Gamma GT or GET > 30 IU/L
5. AST > 30 IU/L
6. ALT > 30 IU/L

LXX. Soft tissue mass of the abdominal wall\textsuperscript{96,112-115} \textsuperscript{[CPT® 74150 or 74160]}

LXXI. Unilateral leg edema\textsuperscript{97} (See CT of the abdomen and pelvis, 74176, 74177, or 74178)

1.

LXXII. Evaluation of congenital anomalies of the abdomen

LXXIII. Arteriovenous fistula with “high output” heart failure:\textsuperscript{103-104}
A. CT Chest with contrast (CPT® 71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) OR
B. CTA Chest (CPT® 71275) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) OR
C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) OR
D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)

LXXIV. Intra-Abdominal Mass detected by other means\textsuperscript{112-115} \textsuperscript{[CPT 74150 or 74160]} (One of the following)
A. Mass is seen on prior imaging
B. Physical exam suggests a palpable mass

LXXV. Gallbladder polyps
A. Gallbladder polyps of any size associated with primary sclerosing cholangitis CT (CPT® 74170) may be approved for further characterization of the lesion and for surgical planning.
B. CT abdomen (CPT® 74160 or CPT® 74170) if:
1. Age > 60
2. Polyp noted to have a sessile morphology or is suspicious for malignancy in the radiology report.
3. Polyps > 10mm
C. Follow-up imaging with CT can be done at 6 months, and then at another 12 months.

LXXVI. Incidental Splenic Findings
A. Incidental splenic findings on US: CT abdomen (CPT® 74170) or MRI abdomen (CPT® 74183) can be obtained
B. Incidental splenic findings on CT or MRI:
1. Imaging is diagnostic of a benign lesion (simple cyst, hemangioma) or characteristics are benign-appearing (homogenous, low attenuation, no enhancement, smooth margins): No follow-up imaging.
2. Imaging characteristics are not diagnostic:
a. If prior imaging is available and there is one year of stability, no follow up imaging. If not stable, consider MRI if not done, biopsy, or PET.
b. If no prior imaging and no known malignancy, but suspicious imaging features suggest possible malignancy:
   i. MRI if not already done or biopsy.
   ii. If MRI still inconclusive and biopsy is not feasible then PET can be considered
   iii. Indeterminate imaging features: (equivocal but not suspicious for malignancy): Follow up MRI in 6 and 12 months.
c. If no prior imaging and there is a known malignancy:
   i. < 1 cm: follow up MRI in 6 and 12 months
   ii. > 1 cm: consider MRI if not done, biopsy. If MRI still inconclusive and biopsy is not feasible then PET can be considered.

LXXVII. Post Liver Transplant
A. If known hepatocellular carcinoma (i.e. transplant performed for treatment of HCC, or if a de novo HCC is discovered in the explant liver): CT Abdomen (CPT® 74160 or CPT® 74170) every 6 months for 3 years.

LXXVIII. Liver Lesion
A. Focal Nodular Hyperplasia (FNH)\textsuperscript{120}
   1. MRI (CPT® 74183) or Multiphase CT (CPT® 74160 or CPT® 74170) to confirm a diagnosis of FNH.
   2. Follow-up with MRI or CT (CPT® 74160 or CPT® 74170) or MRI (CPT® 74183) can be done if the lesion is not adequately visualized on US.
B. US of the abdomen (CPT® 76700) is the initial study of choice in children\textsuperscript{121-125}

References:


97. Ajani JA, D’Amico TA, Almhanna K et al, National Comprehensive Cancer Network (NCCN) Guidelines Version 1.2017. Gastric cancer, available at: https://www.nccn.org/professionals/physician_gls/pdf/gastric.pdf Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Gastric cancer V 1.2017. ©2017 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.


74150, 74160, 74170 CT Abdomen
Note: For evaluation of PVD, the appropriate CPT code is 75635 (CTA abdominal aorta with runoff) rather than either CTA abdomen or CTA pelvis.

I. Intestinal angina (or chronic mesenteric ischemia)\textsuperscript{1-6}
   A. Recurrent acute episodes of abdominal pain [All of the following]
      1. Postprandial epigastric pain, occasionally radiates to the back
      2. Weight loss
      3. Fear of eating

II. Acute mesenteric ischemia with abdominal pain and bleeding
    [One of the following]\textsuperscript{5,6}
   A. Acute mesenteric ischemia is being considered (life-threatening condition)

III. Evaluation of renal or liver transplant donor\textsuperscript{1,7,8}

IV. Abdominal Aortic Aneurysm (AAA)\textsuperscript{33-35} (One of the following)
   A. For non-obese patients, ultrasound (CPT\textsuperscript{®}76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass
   B. For obese patients, CT abdomen with contrast (CPT\textsuperscript{®}74160) can be substituted for US using the same timeline as non-obese patient
   C. One-time screening recommendations for AAA (Ultrasound (CPT\textsuperscript{®}76775):
      1. Men age 65 to 75 who have smoked
      2. Women and non-smokers – no routine screening
      3. Medicare covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
         a. Family history of AAA
         b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime
   D. Surveillance recommendations for AAA (Ultrasound (CPT\textsuperscript{®}76775):
      1. 2.6-2.9cm \(\rightarrow\) once at 5 years
      2. 3.0-3.4cm \(\rightarrow\) once at 3 years
      3. 3.5-4.4cm \(\rightarrow\) annually
      4. 4.5-5.4 cm \(\rightarrow\) every 6 months
   E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or at least 1 cm in a year may undergo more frequent monitoring and should be evaluated by a Vascular Specialist
   F. Preoperative imaging if endovascular or open repair of AAA is being considered (CPT\textsuperscript{®} 74177, 74178, 74175 or 72191)
G. New onset of back and/or abdominal pain in a patient with a known AAA
(CPT® 74177, 74178, 74175 or 72191)

H. Post Open Aortic Repair:
   1. Every 3 years to screen for aneurysms in the remaining aorta

I. Post Endovascular (Stent) Aortic Repair:
   1. 1 month
   2. 3 months if there was evidence of endoleak on the 1 month study
   3. 6 months
   4. 12 months
   5. Every year

V. Peripheral arterial vascular disease\textsuperscript{1,15, 16}
Note: For evaluation of PVD, unlike with MRA studies, the appropriate CPT code is 75635 (CTA abdominal aorta with runoff) rather than either CTA abdomen or CTA pelvis or CTA of the extremities.

VI. Thoracic Aorta\textsuperscript{126-136}
NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians’ preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

<table>
<thead>
<tr>
<th>Table of Thoracic Aorta Imaging Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT® 71275, CPT® 74175, CPT® 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT® 71555, CPT® 74185, CPT® 72198)</td>
</tr>
</tbody>
</table>

A. Aortic Dissection
   1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
   2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
      a. “Medically” treated
         i. Every 6 months if total aortic diameter is \( \geq 4.5 \) cm
         ii. Annually if total aortic diameter is \(< 4.5 \) cm
      b. Surgery or Stent for any type of dissection
         i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
   1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
      a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:

3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. >/=4.5 TAA can be followed every 6 months
      iii. >/= 3.0 cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Suspicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
      i. First year: 1 month, 3 months, 6 months, 12 months, then annually

4. Screening with abdominal aortic Aneurysm (AAA)
   a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US
   b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes
   1. Screening for Familial Syndromes and Genetic Syndromes
      a. Suspected Familial Thoracic Aortic Aneurysm
         i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection
      b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately
      c. Follow-Up per TAA Follow-Up guidelines
   2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
      a. Suspected, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
      b. Follow-up
         i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve
   1. Screening for Bicuspid Aortic Valve
      a. Suspected, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
         i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
         ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.
      b. Follow-up per TAA Follow-Up guidelines
i. If no dilation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

VII. Evaluation of the hepatic arteries and veins (including portal vein) [One of the following]1,22-24
A. Evaluation of portal and hepatic veins prior to or following TIPS (transjugular intrahepatic portosystemic shunt)
B. Evaluation of portal and hepatic veins prior to or following surgical intervention for portal hypertension
C. Evaluation of hepatic vasculature prior to and following embolization procedure
D. Evaluation of hepatic vasculature prior to planned hepatectomy
E. Evaluation of liver donor
F. Suspected hepatic vein thrombosis or Budd Chiari syndrome [One of the following]
   1. Ascites
   2. Hepatomegaly
   3. Inadequate Doppler ultrasound of hepatic veins
G. Possible portal vein thrombosis with negative or inadequate Doppler study of the portal vein [One of the following]
   1. Hypercoagulable state
   2. Abdominal malignancy
H. Preoperative evaluation for pancreatic cancer

VIII. Evaluation of abdominal veins other than hepatic and portal veins [One of the following]1
A. Nephrotic syndrome
B. Suspicion of iliac vein thrombus
C. Suspicion of inferior vena cava thrombus
D. Renal vein thrombosis
E. Mesenteric vein thrombosis

IX. Vasculitis and collagen vascular disease1,25,26 [One of the following]
A. History of collagen vascular disease
B. Blue toe syndrome
C. Claudication
D. Non healing vascular ulcers of the lower extremity
E. History of suspicion of polyarteritis nodosa
F. Known or suspected Takayasu’s arteritis
G. Henoch-Schönlein purpura

X. Suspected pelvic AVM1,27 [One of the following]
A. Pulsatile pelvic mass
B. Incidental finding on prior imaging including ultrasound
C. Pelvic pain
XI. Planning for transcatheter aortic valve implantation (TAVI) or transcatheter aortic valve replacement (TAVR)\textsuperscript{28,29}

XII. Preoperative planning of breast reconstruction using a tissue flap (CTA of the abdomen and pelvis)\textsuperscript{30}

XIII. Arteriovenous fistula with “high output” heart failure:\textsuperscript{31-32}
   A. CT Chest with contrast (CPT®71260 ) and/or CT Abdomen and/or CT Pelvis with contrast (CPT®74160 or CPT®72193 or CPT®74177) OR
   B. CTA Chest (CPT®71275 ) and/or CTA Abdomen and/or CTA Pelvis (CPT®74175 or CPT®72191 or CPT®74174) OR
   C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT®71552 and/or CPT®74183 and/or CPT®72197) OR
   D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT®71555 and/or CPT®74185 and/or CPT®72198)

XIV. Iliac Artery Aneurysm (IAA)\textsuperscript{33,36}
   A. Evaluation of a suspected IAA should begin with ultrasound
   B. If ultrasound is equivocal, CT pelvis with contrast (CPT®72193) may be performed
   C. Follow-up imaging studies can be performed annually
   D. Preoperative imaging if endovascular or open repair is being considered (CPT® 74177, 74178, or 74174)
   E. Post endovascular iliac repair (stent): (CPT® 72191, 72193, 72194, or 72198)
      1. 1 week
      2. 1 month
      3. 3 months
      4. 6 months
      5. Every 6 months thereafter

XV. GI Bleeding\textsuperscript{37,38}
   A. Endoscopy should be first step in evaluation for GI bleeding
   B. (CPT® 74174, 74175, or 74177) can be considered if any of the following is accompanied with GI bleeding:
      1. Severe abdominal pain
      2. Hemodynamic instability (shock)
      3. Endoscopy is contraindicated or negative
References:


2. Shih MP, Hagspiel. CTA and MRA in mesenteric ischemia: part 1, role in diagnosis and differential diagnosis, AJR, 2007; 188:452-461.


74175 CTA of the Abdomen

Note: For evaluation of PVD, the appropriate CPT code is 75635 (CTA abdominal aorta with runoff) rather than either CTA abdomen or CTA pelvis.

I. Renovascular hypertension, suspected renal artery stenosis\textsuperscript{1-7}
   [One of the following] (MRA is preferred if there is decreased renal function)
   A. Severe hypertension (>90 diastolic) with [One of the following]
      1. Progressive renal insufficiency (MRA is preferred)
      2. Resistant to three blood pressure medications and two serial blood pressure measurements (>140/90 without history of diabetes or renal disease or >130/80 with diabetes or renal disease)
   B. Sudden onset of significant hypertension (generally >160/100) or flash pulmonary edema
   C. Previously stable hypertension, with worsening hypertension or worsening renal function/increasing creatinine (especially after the administration of an ACE inhibitor or with angiotensin receptor blocking agent).
   D. Hypertension (> 100) in adult < 40 years old
   E. New onset significant hypertension (>90 diastolic) after age 50
   F. Hypertension in a patient with:
      1. Diffuse atherosclerosis or
      2. Incidentally detected asymmetry of kidney size > 1.5 cm
   G. Abdominal bruit
   H. Recurring acute pulmonary edema with significant hypertension)
   I. Hypokalemia (<3.5 mmol/L) with normal or elevated plasma renin (>1 ng/ml/Hr) levels in the absence of diuretic therapy
   J. Children with hypertension (MRA is preferred)
   K. Hypertension and documented neurofibromatosis

II. Intestinal angina (mesenteric ischemia) (CTA of the abdomen and pelvis, 74174)\textsuperscript{1,8-12}

III. Acute mesenteric ischemia with abdominal pain and bleeding (CTA of the abdomen and pelvis, 74174)\textsuperscript{8-12}

IV. Evaluation of renal or liver transplant donor\textsuperscript{1,13,14}

V. Abdominal Aortic aneurysm (AAA)\textsuperscript{37-39} (One of the following)
   A. For non-obese patients, ultrasound (CPT\textsuperscript{®}76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass
   B. For obese patients, CT abdomen with contrast (CPT\textsuperscript{®}74160) can be substituted for US using the same timeline as non-obese patient
   C. One-time screening recommendations for AAA (Ultrasound (CPT\textsuperscript{®}76775):
1. Men age 65 to 75 who have smoked
2. Women and non-smokers – no routine screening
3. **Medicare** covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
   a. Family history of AAA
   b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime

D. Surveillance recommendations for AAA (Ultrasound (CPT®76775)):
   1. 2.6-2.9 cm → once at 5 years
   2. 3.0-3.4 cm → once at 3 years
   3. 3.5-4.4 cm → annually
   4. 4.5-5.4 cm → every 6 months

E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or at least 1 cm in a year may undergo more frequent monitoring and should be evaluated by a Vascular Specialist

F. Preoperative imaging if endovascular or open repair of AAA is being considered (CPT® 74177, 74178, 74175 or 72191)

G. New onset of back and/or abdominal pain in a patient with a known AAA (CPT® 74177, 74178, 74175 or 72191)

H. Post Open Aortic Repair:
   1. Every 3 years to screen for aneurysms in the remaining aorta

I. Post Endovascular (Stent) Aortic Repair:
   1. 1 month
   2. 3 months if there was evidence of endoleak on the 1 month study
   3. 6 months
   4. 12 months
   5. Every year

**VI. Iliac Artery Aneurysm**

A. Evaluation of a suspected IAA should begin with ultrasound
   1. If ultrasound is equivocal, CT pelvis with contrast (CPT®72193) may be performed.
   2. Follow-up imaging studies can be performed annually

B. Additional Imaging
   1. CT of the abdomen and pelvis with contrast (CPT®74177), CT of the abdomen and pelvis without and with contrast (CPT®74178), or CTA abdomen and pelvis(CPT®74174).
      a. Preoperative imaging if endovascular or open repair is being considered

C. Additional Information
   1. Iliac artery aneurysms are most commonly associated with aortic aneurysms
   2. Isolated IAA aneurysms are
   3. Approximately one third to one half of isolated IAA with aortic aneurysms has a presentation.
   4. The majority of patients are male and between 50 and 70 years old.
   5. The normal size of the iliac artery is <1cm.
6. Aneurysm rupture usually occurs at a diameter of 5 cm or larger, whereas common
   a. Iliac aneurysms that are less than 3 cm in diameter almost never rupture.

VII. Suspected/Screening for Visceral Artery Aneurysm (spleen, kidney, liver or intestines) imaging can include47:
A. Ultrasound (CPT®76700 or CPT®76705) or
B. CTA abdomen (CPT®74175) or
C. CT abdomen with contrast (CPT®74160)
D. Further monitoring can be with Ultrasound (CPT®76700 or CPT®76705) or CTA abdomen (CPT®74175) or CT abdomen with contrast (CPT®74160) based on the intervals below or as determined by a vascular specialist:
   1. Post-stent placement are without guidelines and therefore reasonable to follow the same table as for endovascular aortic repair: CTA of abdomen (CPT®74175), MRA of abdomen (CPT®74185), or CTA abdomen (CPT®74160) at 1 month, 6 months, and 12 months following stent placement, then every year. An additional study can be done at 3 months if there was evidence of endoleak on the 1 month study.

E. Visceral Artery Aneurysms
   1. The original arterial diameter.
   2. Vascular specialist consultation is beneficial in order to determine the timeframe to intervention.
   3. Thurner Syndrome (Iliac Vein Compression Syndrome), imaging can include:
      a. MRI Pelvis without contrast (CPT®72195) or MRI Pelvis without and with contrast (CPT®72195) or
      b. MRA/MRV Pelvis (CPT®72198) or
      c. CTA/CTV Pelvis (CPT®72191) or
      d. Duplex ultrasound (CPT®93975 or CPT®93976) or
      e. Traditional venography

F. May-Thurner Syndrome
   1. This is a rare condition caused by compression of the left common iliac vein by the overlying right common iliac artery.
   2. It may cause discomfort and edema of the lower extremity, DVT in the iliofemoral vein or lower extremity DVT which may be recurrent.

VIII. Peripheral arterial vascular disease1,22-24
Note: For evaluation of PVD, unlike with MRA studies, the appropriate CPT code is 75635 (CTA abdominal aorta with runoff) rather than either CTA abdomen or CTA pelvis or CTA of the extremities.
IX. Thoracic Aorta

NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians' preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

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<th>Table of Thoracic Aorta Imaging Options</th>
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<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT® 71275, CPT® 74175, CPT® 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT® 71555, CPT® 74185, CPT® 72198)</td>
</tr>
</tbody>
</table>

A. Aortic Dissection
1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
   a. “Medically” treated
      i. Every 6 months if total aortic diameter is ≥4.5 cm
      ii. Annually if total aortic diameter is <4.5 cm
   b. Surgery or Stent for any type of dissection
      i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. ≥4.5 cm TAA can be followed every 6 months
      iii. ≥3.0 cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Suspicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
      i. First year: 1 month, 3 months, 6 months, 12 months, then annually
4. Screening with abdominal aortic aneurysm (AAA)
a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)

b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes

1. Screening for Familial Syndromes and Genetic Syndromes
   a. Suspected Familial Thoracic Aortic Aneurysm
      i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection

   b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately

   c. Follow-Up per TAA Follow-Up guidelines

2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
   a. Suspected, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.

   b. Follow-up
      i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve

1. Screening for Bicuspid Aortic Valve
   a. Suspected, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
      i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
      ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.

   b. Follow-up per TAA Follow-Up guidelines
      i. If no dilation of the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

X. Evaluation of the hepatic arteries and veins (including portal vein) [One of the following]¹,¹³,³⁰-³²

A. Evaluation of portal and hepatic veins prior to or following TIPS (transjugular intrahepatic portosystemic shunt)

B. Evaluation of portal and hepatic veins prior to or following surgical intervention for portal hypertension

C. Evaluation of hepatic vasculature prior to and following embolization procedure

D. Evaluation of hepatic vasculature prior to planned hepatectomy

E. Evaluation of liver donor

F. Suspected hepatic vein thrombosis or Budd-Chiari syndrome [One of the following]
   1. Ascites
   2. Hepatomegaly
3. Inadequate Doppler ultrasound of hepatic veins
G. Possible portal vein thrombosis with negative or inadequate Doppler study of the portal vein
  1. Hypercoagulable state
H. Preoperative evaluation for pancreatic cancer

XI. Evaluation of abdominal veins other than hepatic and portal veins [One of the following]
   A. Nephrotic syndrome
   B. Suspicion of iliac vein thrombus
   C. Suspicion of inferior vena cava thrombus
   D. Renal vein thrombosis – See XII
   E. Mesenteric vein thrombosis

XII. Vasculitis and collagen vascular disease (CTA of abdomen and pelvis, 74174)

XIII. Pancreatic cancer – preoperative evaluation of abdominal vessels
   A. Documentation of pancreatic mass on prior CT or MRI

XIV. Suspected renal vein thrombosis (Ultrasound) [One of the following]
   A. Nephrotic syndrome
   B. Proteinuria- 3 grams or more in 24 hours
   C. Lupus nephritis
   D. Hypercoagulable state [One of the following]
      1. Antiphospholipid antibodies
      2. Behçet’s syndrome
      3. Protein C deficiency
      4. Protein S deficiency
      5. Factor V Leiden deficiency
      6. Lupus anticoagulant
      7. Hyperactive platelet syndrome
      8. MRHFR
      9. Anti-cardiolipin antibodies
     10. Elevated homocysteine level
    11. Anti B2 glycoprotein antibodies
    12. Elevated fibrinogen
    13. PTT abnormal
    14. Antithrombin III antibodies
    15. Oral contraceptive use
    16. Hormone replacement
    17. Sickle cell anemia

XV. Preoperative planning of breast reconstruction using a tissue flap (CTA of the abdomen and pelvis)

XVI. Arteriovenous fistula with “high output” heart failure:

A. CT Chest with contrast (CPT®71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT®74160 or CPT®72193 or CPT®74177) OR
B. CTA Chest (CPT®71275) and/or CTA Abdomen and/or CTA Pelvis (CPT®74175 or CPT®72191 or CPT®74174) OR
C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT®71552 and/or CPT®74183 and/or CPT®72197) OR
D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT®71555 and/or CPT®74185 and/or CPT®72198)

XVII. Trauma – Spleen

A. Ultrasound of the abdomen (CPT®76700 or CPT®76705) and pelvis (CPT®76856 or CPT®76857) or CT3,4,5 of the abdomen and pelvis without and with contrast (CPT®74178) or with contrast are indicated in patients with blunt abdominal trauma with suspected splenic rupture or in patients with penetrating trauma to the left upper quadrant

XVIII. GI Bleeding

A. Endoscopy should be first step in evaluation for GI bleeding
B. (CPT® 74174, 74175, or 74177) can be considered if any of the following is accompanied with GI bleeding:
1. Severe abdominal pain
2. Hemodynamic instability (shock)
3. Endoscopy is contraindicated or negative

References:

1. American College of Radiology (ACR), North American Society for Cardiovascular Imaging (NASCI), Society for Pediatric Radiology (SPR), ACR-NASCI-SPR practice guideline for the performance of pediatric and adult body magnetic resonance angiography (MRA), [online publication].
8. Shih MP, Hagspiel KD. CTA and MRA in mesenteric ischemia: part 1, role in diagnosis and differential diagnosis, AJR, 2007; 188:452-461.


74175 CTA of the Abdomen

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74176  CT Abdomen and Pelvis without Contrast
74177  CT Abdomen and Pelvis with Contrast
74178  CT Abdomen One or Both Body Regions without and with Contrast

Note: For radiation therapy planning use 77014. For CT guided needle placement, biopsy or drainage use 77012. For CT guided tissue ablation use 77013.

I. Complaints associated with abdominal or pelvic pain\textsuperscript{1-11} [One of the following]

A. Generalized Abdominal pain\textsuperscript{112-118} (CT of the abdomen and pelvis with contrast) one of the following:
   1. If equivocal ultrasound or
   2. Pain is accompanied with any one of the following:
      a. Failure of conservative treatment for 4 weeks
      b. Cancer history
      c. Any one Red Flag Sign:
         i. Fever (101 degrees or greater)
         ii. Mass
         iii. GI bleeding
         iv. Moderate to severe abdominal tenderness
         v. Guarding, rebound tenderness, or other peritoneal signs
         vi. Elevated WBC as per the testing laboratory’s range

B. Obstructive uropathy or hydronephrosis with negative ultrasound [One of the following]
   1. Pain in flank, radiating toward the groin
   2. Hematuria

C. Diverticulitis with left lower quadrant pain [One of the following]
   1. Failed 7 days antibiotic treatment
   2. History of diverticulitis
   3. Any red flag sign
   4. Prior to colonoscopy (if requested by the physician who will be performing the endoscopy.
   5. Lower abdomen mass

D. Abscess [One of the following]
   1. Acute non localized abdominal pain
      a. Any red flag sign
   2. Follow up during or after treatment [One of the following]
      a. Condition unimproved or worsening while on treatment
      b. Routine follow-up study after treatment, including evaluation for removal of drain
E. Appendicitis (In children and pregnant women, ultrasound is the initial study except for follow up of known appendicitis with suspected complications. If this is not possible then CT of the abdomen and pelvis. MRI abdomen [74181, 74182, or 74183] in pregnant women)
1. Right lower quadrant pain [One of the following]
   a. Any red flag

F. Crohn’s disease and inflammatory bowel disease (For children and women of childbearing age, consider MRI enterography) [One of the following]
1. Suspected Crohn’s disease [One of the following]
   a. Abdominal pain and diarrhea for more than 6 weeks
   b. Aural temperature >38.3°C or >100.9°F
   c. Perianal fistula or fissure
   d. Enterovesical fistula
   e. Enterovaginal fistula
   f. Enterocutaneous fistula
   g. Children with unexplained anemia, growth failure, and abdominal pain
2. Complications of known Crohn’s disease [One of the following]
   a. Mass on abdominal, pelvic or rectal exam
   b. Any one Red Flag Sign
   c. Follow-up during or after treatment [One of the following]
      i. Condition unimproved or worsening after drainage and IV antibiotics for at least two days
      ii. Condition unimproved or worsening after IV Abx Rx >1 wk
      iii. Routine follow-up study after treatment, including evaluation for removal of drain
   d. Fistula
   e. Small bowel obstruction
   f. Perianal fistula
   g. Stricture or stenosis
   h. Diarrhea
3. Any evidence of clinical deterioration while on steroids or immunosuppressives
4. Follow-up during or after treatment [One of the following]
   a. Condition unimproved or worsening under treatment
   b. Routine follow-up study after treatment, including evaluation for removal of drain

G. Ulcerative colitis with bloody mucoid stools [One of the following]
1. Diarrhea
2. Pain
3. Tenesmus

H. CT of the abdomen and pelvic either with or without contrast (CPT® 74177 or CPT® 74176) can be performed prior to endoscopy if requested by the physician who will be performing the endoscopy, especially if there is suspected inflammatory bowel disease162-165
II. Evaluation of symptoms after any abdominopelvic surgery\(^1\) [One of the following]
   A. Any intra-abdominal surgery
      1. Acute non localized abdominal pain
      2. Any Red Flag Sign
   B. Follow up after percutaneous drainage of intra-abdominal, retroperitoneal or pelvic abscess

III. Abdominal Aortic Aneurysm (AAA)\(^{156-158}\) (One of the following)
   A. For non-obese patients, ultrasound (CPT\(^{\circledR}\) 76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass
   B. For obese patients, CT abdomen and Pelvis with contrast (CPT\(^{\circledR}\)74177) can be substituted for US using the same timeline as non-obese patient
   C. One-time screening recommendations for AAA (Ultrasound CPT\(^{\circledR}\) 76775):
      1. Men age 65 to 75 who have smoked
      2. Women and non-smokers – no routine screening
      3. Medicare covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
         a. Family history of AAA
         b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime
   D. Surveillance recommendations for AAA (Ultrasound CPT\(^{\circledR}\) 76775):
      1. 2.6-2.9cm → once at 5 years
      2. 3.0-3.4cm → once at 3 years
      3. 3.5-4.4cm → annually
      4. 4.5-5.4 cm → every 6 months
   E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or at least 1 cm in a year may undergo more frequent monitoring and should be evaluated by a Vascular Specialist
   F. Preoperative imaging if endovascular or open repair of AAA is being considered (CPT\(^{\circledR}\) 74177, 74178, 74175 or 72191)
   G. New onset of back and/or abdominal pain in a patient with a known AAA (CPT\(^{\circledR}\) 74177, 74178, 74175 or 72191)
   H. Post Open Aortic Repair: (CPT\(^{\circledR}\) 74177 or 74178)
      1. Every 3 years to screen for aneurysms in the remaining aorta
   I. Post Endovascular (Stent) Aortic Repair: (CPT\(^{\circledR}\) 74177 or 74178)
      1. 1 month
      2. 3 months if there was evidence of endoleak on the 1 month study
      3. 6 months
      4. 12 months
      5. Every year
IV. Thoracic Aorta

NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians' preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

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</tbody>
</table>

A. Aortic Dissection
1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
   a. “Medically” treated
      i. Every 6 months if total aortic diameter is ≥4.5 cm
      ii. Annually if total aortic diameter is <4.5 cm
   b. Surgery or Stent for any type of dissection
      i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. ≥4.5 TAA can be followed every 6 months
      iii. ≥3.0 cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Suspicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
i. First year: 1 month, 3 months, 6 months, 12 months, then annually

4. Screening with abdominal aortic Aneurysm (AAA)
   a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)
   b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes
   1. Screening for Familial Syndromes and Genetic Syndromes
      a. **Suspected** Familial Thoracic Aortic Aneurysm
         i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection
         b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately
         c. [Follow-Up] per TAA Follow-Up guidelines
   2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
      a. **Suspected**, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
      b. Follow-up
         i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve
   1. Screening for Bicuspid Aortic Valve
      a. **Suspected**, any requested imaging from the “Table of Thoracic Aorta Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
         i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
         ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.
      b. Follow-up
         i. If no dilation for the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

V. **Small bowel obstruction**^[21-23][One of the following]
   A. Abdominal distention on exam
   B. Constipation or obstipation (no stool or gas for 24-48 hours)
   C. Borborygmus, loud bowel sounds, high pitched tinkling sounds
   D. Colicky abdominal pain
   E. Tympani
   F. High pitched bowel sounds
   G. Abdominal mass
   H. Nausea and vomiting
   I. X-ray demonstrating or suggesting small bowel obstruction
   J. Incomplete or intermittent small bowel obstruction
VI. Pancreatitis with abdominal pain or pancreatic pseudocyst\textsuperscript{57-59}  

[One of the following]

A. Suspected acute pancreatitis with abdominal pain [One of the following]
   1. [One of the following]
      a. Amylase >3 times the upper normal laboratory value
      b. Lipase >3 times the upper normal laboratory value
      c. Red Flag Signs
      d. Mass
      e. No improvement with medical therapy
      f. Suspected complications including peripancreatic effusions, pseudocysts, abscess, and pancreatic necrosis
   2. Initial scan at onset of abdominal pain but serum amylase and lipase are not >3 times normal but with severe abdominal pain and epigastric pain that increases rapidly in severity and persists without any relief
   3. Suspected pancreatitis and ultrasound findings do not explain symptoms (gallstones, common duct, etc)
   4. Follow up scan 7-21 days after onset of symptoms with a confirmed diagnosis
   5. MRI without and with contrast\textsuperscript{2} (CPT\textsuperscript{®}74183) is considered if:
      a. CT is contraindicated and CT indications met or equivocal
   6. MR cholangiopancreatography\textsuperscript{1,2} can be considered if:
      a. Suspected gallstone pancreatitis to screen for those patients who would benefit from ERCP
      b. Recurrent, acute pancreatitis with no known cause
      c. Evaluation of patients with suspicion of pancreatic ductal anomalies that may predispose patients to pancreatitis
   7. Plain abdominal X-ray (KUB) and ultrasound (CPT\textsuperscript{®}76700 or CPT\textsuperscript{®}76705) are not characteristic and diagnostic in known chronic pancreatitis and findings will affect management decisions

B. Known pancreatitis with any of the following allows for repeat exams if present [One of the following]
   1. Hemodynamic instability
      a. Falling hematocrit
      b. Falling blood pressure
   2. Aural temperature > 38.3°C or > 100.9°F
   3. White blood cell count or leukocytosis of >12,000 cells/mm\textsuperscript{3}
   4. White blood cell count < 4000 cells/mm\textsuperscript{3}
   5. Retroperitoneal air on prior CT
   6. Positive blood culture
   7. Signs of peritonitis (rebound, or guarding or tenderness)
   8. Poor oxygen saturation, signs of ARDS (adult respiratory distress syndrome)
   9. Signs of renal failure rising BUN and creatinine

C. Suspected pancreatic pseudocyst [Both of the following]
   1. History [One of the following]
      a. Acute pancreatitis with onset at least 4 wks earlier
b. Pancreatitis secondary to trauma (time irrelevant)
c. Chronic pancreatitis

2. Clinical findings [One of the following]
a. Abdominal/back pain
b. Abdominal tenderness
c. Abdominal mass

D. Pancreatic Pseudocysts\textsuperscript{119-120}
   1. CT of the abdomen with contrast (CPT\textsuperscript{®} 74160), or without and with contrast (CPT\textsuperscript{®}74170)\textsuperscript{1,2} or abdominal MRI without and with contrast (CPT\textsuperscript{®} 74183)
      a. Minimal symptoms - every two weeks, up to six weeks total. Thereafter, every 4 weeks.
      b. Anytime symptoms worsen, including development of ascites or pleural effusion, increasing serum amylase, or if drainage of the cyst is planned

VII. Chronic pancreatitis with history of recurrent pancreatitis and abdominal pain and no definitive diagnosis with ultrasound or endoscopic ultrasound\textsuperscript{60, 61} (not helpful for early diagnosis; only confirmation of diagnosis and surgical planning)

VIII. Pancreatic Lesion (Incidental Pancreatic Cyst)\textsuperscript{119-120}
   A. Abdominal CT (CPT\textsuperscript{®} 74170) preferably, thin slice or MRI with and without contrast (CPT\textsuperscript{®} 74183) for any of the following:
      1. Every 12 months after the initial incremental finding if <1cm in size
      2. Every 6 to 12 months after the initial finding if 1-2 cm in size
      3. Every 6-12 months after the initial finding if greater than 2 cm in size
   B. The following lesions should be evaluated by endoscopic ultrasound (EUS) and MRCP
      1. Pancreatic lesions >3 cm; or,
      2. Pancreatic lesions of any size with concerning features (mural nodules, dilated duct, pain, positive cytology, jaundice, worsening diabetes, etc.).

IX. Adrenal disease or mass including adrenal carcinoma\textsuperscript{45, 62-66} [One of the following]
   A. Pheochromocytoma/paraganglioma
      CT Abdomen and Pelvis with contrast (CPT\textsuperscript{®} 74177) or CT Abdomen and Pelvis without and with contrast (CPT\textsuperscript{®} 74178) may be obtained for one of the following:
      1. Suspected pheochromocytoma or paraganglioma (one of the following)
         a. Fractionated metanephrines in plasma > 3-4 times the upper laboratory limit
         b. 24 hour urinary total metanephrine >1800µg
         c. Clonidine suppression test positive (plasma norepinephrine is > 500pg/ml or > 2.96nmol/L or < 50% decrease in plasma norepinephrine) if fractionated metanephrines are above normal but less than 4 times the upper limit of normal
d. Suspicion of pheochromocytoma in individual with MEN2, von Hippel-Lindau syndrome and neurofibromatosis type 1 (NF-1) if the blood and urine tests are not abnormal

2. Initial staging of newly diagnosed pheochromocytoma

3. Monitoring response to treatment for unresectable or metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months

4. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers

5. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

B. **Adrenocortical carcinoma**

   CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment for unresectable or metastatic disease:
      a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
      b. Patients receiving somatostatin analogues – every 3 months
   3. Suspected recurrence based on one of the following:
      a. New symptoms
      b. Rising tumor markers
   4. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

C. **Functional Adrenal Tumors**

   CT Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
   1. Suspected Cushing’s syndrome [One of the following]
      a. 24 hour urine free cortisol > 100 mcg/24 hr
      b. No suppression by dexamethasone
   2. Suspected aldosteronoma or primary aldosteronism or Conn’s syndrome [One of the following]
      a. Hypertension that is drug resistant (need for > 3 drugs)
      b. Spontaneous (<3.5 mEq/L) or severe diuretic-induced (< 3 mEq/L) hypokalemia
      c. Plasma aldosterone to renin ratio > 10 when aldosterone is measured in ng/dL
      d. 24 hour urinary aldosterone excretion test > 14µg/day

D. **Incidental Adrenal lesion**

   To evaluate incidental finding on other imaging such as CT or MRI scan performed for other purposes (CT or MRI of the chest or heart), or US with no history of malignancy [One of the following]
1. Asymptomatic adrenal mass >1 cm
   a. No further imaging, regardless of size, if imaging is diagnostic for benign findings, including any of the following:
      i. Myelolipoma (macroscopic fat) or
      ii. Calcified mass or
      iii. < 10 HU on CT or decreased signal on Chemical Shift MRI (CS-MRI) consistent with benign adenoma, or
      iv. If imaging was completed with and without contrast and enhancement (defined as < 10 HU change between unenhanced and enhanced/contrasted CT scan e.g. cyst, hemorrhage).

2. Asymptomatic adrenal mass 1 to < 4 cm with indeterminate imaging on any CT or MRI and no prior imaging for comparison:
   a. 1 to 2 cm:
      i. 12 month CT Abdomen without and with contrast imaging (adrenal protocol) or may consider CS-MRI (chemical shift MRI), especially if CT contraindicated
      ii. If stable ≥ 1 year, no further imaging—likely benign
   b. > 2 cm to < 4 cm:
      i. CT Abdomen without and with contrast (adrenal protocol); may consider CS-MRI (chemical shift MRI), especially if CT Contraindicated
      ii. No further follow up imaging if:
         01. Absolute Percentage Washout/Relative Percentage Washout (APW/RPW) > 60/40% Benign adenoma;
         02. No enhancement (defined as change in pre- and post-contrast imaging of <10 HU Cyst or hemorrhage
      iii. If APR/RPW <60/40%:
         01. Consider 6-12 month follow up imaging, or
         02. Resection for possible primary adrenocortical carcinoma, with biochemical evaluation to determine functional status and to exclude pheochromocytoma prior to resection
         03. If not resected, follow-up CT abdomen with and without contrast (or CS-MRI) in 6 – 12 months. May consider CS-MRI (chemical shift MRI), especially if CT contraindicated
            a. If enlarging on follow up imaging: Consider resection for possible primary adrenocortical carcinoma; biochemical evaluation to determine functional status and to exclude pheochromocytoma prior to resection.)

3. No history of cancer or > 10 HU on NCCT and Asymptomatic adrenal mass ≥ 4 cm with indeterminate imaging on any CT or MRI:
   a. Biochemical assays to determine functional status to exclude pheochromocytoma prior to resection
   b. Consider resection for possible primary adrenocortical carcinoma

E. To evaluate incidental finding on other imaging such as CT or MRI scan performed for other purposes (CT or MRI of the chest or heart), or US WITH history of malignancy [One of the following]
1. **1 cm to < 4 cm** with indeterminate imaging on any CT or MRI and no prior imaging for comparison
   a. CT abdomen without and with contrast or May consider CS-MRI (chemical shift MRI), especially if CT contraindicated
   b. No further follow up imaging if;
      i. APW/PPW > 60/40%: Benign adenoma; OR
      ii. No enhancement (defined as change in pre- and postcontrast imaging of <10 HU e.g. cyst or hemorrhage);
   c. APW/PPW < 60/40%:
      i. PET CT; consider biopsy;
      ii. Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection.
   d. If enlarging or new lesion:
      i. PET CT or biopsy;
      ii. Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection

2. **> 4 cm** and Indeterminate imaging features on any CT or MRI
   a. PET CT or biopsy
   b. Consider biochemical assays to determine functional status and exclude pheochromocytoma prior to biopsy/resection

**X. Splenomegaly with LUQ pain**

**XI. Complex or solid abdominal or liver mass on recent ultrasound**

**XII. Intra-Abdominal Mass detected by other means** (One of the following)
   A. Mass is seen on prior imaging
   B. Physical exam suggests a palpable mass

**XIII. New renal mass suspected or detected on prior imaging** (For renal cell cancer, see XXXIII below) (One of the following)
   A. Clarification of findings on prior ultrasound or CT and request is for “renal protocol” (CT of the abdomen, CPT code 74150 or 74160 or 74170)
   B. Cystic or solid mass detected on ultrasound
      1. Simple cyst confirmed on prior CT to be simple cyst or Bosniak class I cyst – no further imaging is indicated
   C. Bosniak class II cyst on prior CT (or MRI) (CT of the abdomen, CPT code 74150 or 74160 or 74170)
      1. CT may be certified every 6 months for 3 years and if stable no further imaging

**XIV. Jaundice**
   A. Ultrasound (CPT® 76700 or CPT® 76705) is the preferred initial imaging study to visualize the biliary ductal system when pain is present. Ultrasound often demonstrates the level and cause of any obstruction.
B. Abdomen CT without and with contrast (CPT® 74170) or Abdomen CT with contrast (CPT® 74160) should be considered in the following scenarios:
1. If non-diagnostic or equivocal ultrasound (e.g., large amounts of intestinal gas)
2. Patient is obese
3. Painless jaundice
4. Acute abdominal pain and one of the following:
   a. Fever
   b. Previous biliary surgery
   c. Known cholelithiasis
5. If there is high pretest probability of obstruction due to malignancy

C. MR Cholangiopancreatography (MRCP) may be used to assess the extent and cause of intrahepatic bile duct obstruction
   1. Suggested by either ultrasound or CT if further characterization is warranted.
   2. Contraindications to the use of IV contrast for CT imaging

XV. Fever of unknown origin (FUO)\textsuperscript{70, 71} with aural temperature $>38.3°C$ or $>100.9°F$ on several occasions over at least three weeks [One of the following]
   A. Uncertain diagnosis after lab studies [All of the following]
      1. Three blood cultures
      2. Urine culture
      3. Tuberculin skin test
      4. HIV antibody assay and HIV viral load for patients at high risk
      5. Chest x-ray
   B. Associated night sweats

XVI. Abdominal and pelvic trauma\textsuperscript{72}-Ultrasound (CPT® 76700 and/or CPT® 76856) should be used initially for trauma with low probability of intra-abdominal injury (minimal pain, no evidence of peritoneal irritation on physical examination, no hemodynamic instability, no elevated AST/ALT). [One of the following]
   E. In patients with BMI > 35, ultrasound imaging may be suboptimal and CT Abdomen and Pelvis with contrast may be performed.
   F. To determine whether individuals need hospitalization for observation as a result of blunt renal trauma with hematuria, CT Abdomen and Pelvis without and with contrast (CPT® 74178) should be used initially.
   G. CT Abdomen and/or Pelvis with contrast (CPT® 74160, or CPT® 72193, or CPT® 74177):
      7. High probability intra-abdominal injury
      8. Seat belt sign
      9. Rebound tenderness or guarding
      10. Hypotension
11. Abdominal distension
12. Concomitant femur fracture (may indicate blunt abdominal trauma in patients struck by automobiles)
13. If ultrasound demonstrates any positive finding(s)

**XVII. Weight loss**\(^75\) of 10 pounds more than 5% body weight in a year or less

**XVIII. Hematuria**\(^3\)

**XIX. CT enterography**\(^9,76,77\) [One of the following]
- A. Bowel obstruction
- B. Celiac disease
- C. Polyposis syndromes
- D. Small bowel tumor
- E. Suspected Crohn's disease [One of the following]
  1. Abdominal pain and diarrhea for more than 6 weeks
  2. Aural temperature >38.3°C or >100.9°F
  3. Perianal fistula or fissure
  4. Enterovesical fistula
  5. Enterovaginal fistula
  6. Enterocutaneous fistula
  7. Children with unexplained anemia, growth failure, and abdominal pain
- F. Known Crohn's disease [One of the following]
  1. Mass on abdominal, pelvic or rectal exam
  2. Aural temperature >38.3°C or >100.9°F
  3. Leukocytosis, WBC >11,500/cu.mm
  4. Guarding
  5. Rebound
  6. Follow-up during or after treatment [One of the following]
  7. Condition unimproved or worsening after drainage and IV antibiotics for at least two days
  8. Condition unimproved or worsening after IV Abx Rx >1 wk
  9. Routine follow-up study after treatment, including evaluation for removal of drain
- G. Fistula
- H. Small bowel obstruction
- I. Perianal fistula
- J. Stricture or stenosis
- K. Any evidence of clinical deterioration while on steroids or immunosuppressives

**G. Gastrointestinal Bleeding**
CT Abdomen and Pelvis w/contrast, CT Enterography, or MR Enterography (if CT enterography is contraindicated). CT Enterography should be considered the test of choice given the lack of motion artifact and its superior spatial resolution.
- 1. if small bowel video capsule endoscopy is negative, or
- 2. for further evaluation of abnormal video capsule findings
XX. Evaluation of cirrhosis and portal hypertension82, 83 [One of the following]
   A. Hepatitis B or C
      1. Ultrasound demonstrating a liver mass >1cm
   B. Cirrhosis
      1. Planned TIPS (transjugular intrahepatic portosystemic shunt – relatively noninvasive procedure for portal hypertension)

XXI. Screening for or hepatocellular carcinoma and either known carrier of hepatitis B or C or documented cirrhosis48,84-89 (See CT of the abdomen, CPT codes 74150, 74160 or 74170)

XXII. Follow-up of known renal abscess or complicated pyelonephritis90

XXIII. Abscess1,5,9 [One of the following]
   A. Suspected [Both of the following]
      1. Abdominal pain
      2. Other clinical findings [One of the following]
         a. Mass on abdominal, pelvic or rectal exam
         b. Aural temperature >38.3°C or >100.9°F
         c. Leukocytosis, WBC >11,500/cu.mm
         d. Rebound or guarding
   B. Follow up during or after treatment [One of the following]
      1. Condition unimproved or worsening under treatment
      2. Routine follow-up study after treatment including evaluation for removal of drain

XXIV. Spigelian, Ventral, Umbilical, or Incisional Hernia123-129 [CPT® 74176 or 74177]
   A. Known or suspected primary or recurrent Spigelian hernia (anterior abdominal wall hernia through the semilunar line), ventral hernia, umbilical, or incisional hernia
      1. See A-J above

XXV. Kidney or renal stones2 [One of the following]
   A. Flank pain
   B. Hematuria or blood in the urine
   C. Aural temperature >38.3°C or >100.9°F, chills
   D. Known renal stone for follow up
   E. Hydronephrosis or obstruction on other imaging (such as prior ultrasound or nuclear medicine study)

XXVI. Evaluation of elevated liver function tests and non-diagnostic ultrasound99,100
   A. Laboratory findings [One of the following]
      1. Direct bilirubin >0.2
      2. Total bilirubin >1.9
3. Alkaline phosphatase >147 IU/L
4. Gamma GT or GGT >51 IU/L
5. AST >40 IU/L
6. ALT >56 IU/L

XXVII. Soft tissue mass of the abdominal wall not a hernia \cite{101, 131-134} 
[CPT® 74176 or 74177]

XXVIII. Unilateral leg edema \cite{102} with venous Doppler excluding venous insufficiency or varicose veins [One of the following]
A. Acute unilateral edema [One of the following]
   1. D-dimer <500 ng/ml and low suspicion of deep venous thrombosis
   2. No evidence of ruptured Baker’s cyst or injury to the gastrocnemius muscle
B. Chronic unilateral edema
   1. No evidence of reflex sympathetic dystrophy

XXIX. Head and Neck Cancers
A. CT scan Abdomen (CPT® 74160) or CT scan Abdomen and Pelvis (CPT® 74177) is not routinely indicated for evaluation of head and neck cancer, but may be obtained in specific situations.
B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Signs or symptoms of abdominal metastatic disease
   2. Elevated LFTs
C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Squamous cell carcinoma found within lower neck nodes from an unknown primary site
   2. Prior involvement of pelvis with cancer
   3. New/worsening signs or symptoms related to the pelvis

XXX. Salivary Gland Cancers
A. CT scan Abdomen (CPT® 74160) or CT scan Abdomen and Pelvis (CPT® 74177) is not routinely indicated for evaluation of salivary gland cancer, but may be obtained in specific situations.
B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Signs or symptoms of abdominal metastatic disease
   2. Elevated LFTs
C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in B. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis
XXXI. Thyroid Cancer

A. CT scan Abdomen (CPT® 74160) or CT scan Abdomen and Pelvis (CPT® 74177) is not routinely indicated for evaluation of thyroid cancer, but may be obtained in specific situations.

B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Initial staging of Medullary thyroid cancer for one of the following:
      a. Positive lymph nodes
      b. Serum Calcitonin level >500 pg/mL
   2. Suspected recurrence of Medullary thyroid cancer and one of the following:
      a. Elevated serum Calcitonin
      b. Elevated CEA
      c. Elevated LFTs
      d. Signs or symptoms of abdominal metastatic disease

C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging of Anaplastic thyroid cancer
   2. Suspected recurrence of Anaplastic thyroid cancer
   3. Surveillance of Anaplastic thyroid cancer – every 3 months for 2 years

XXXII. Thymoma and Thymic Carcinoma

A. CT scan Abdomen (CPT® 74160) or CT scan Abdomen and Pelvis (CPT® 74177) is not routinely indicated for evaluation of thymic carcinoma, but may be obtained in specific situations.

B. CT scan Abdomen with contrast (CPT® 74160) may be obtained only for one of the following:
   1. Initial staging of thymoma and thymic carcinoma when extensive mediastinal involvement is noted on CT chest
   2. Suspected recurrence of thymoma and thymic carcinoma when extensive mediastinal involvement is noted on CT chest
   3. Monitoring response to chemotherapy, for known abdominal metastatic disease – every 2 cycles (6 to 8 weeks)
   4. Surveillance – CT scan is not indicated for routine surveillance in asymptomatic individuals

C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in B. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

XXXIII. Non-small cell Lung Cancer

A. CT scan Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment for locally advanced, unresectable or metastatic lung cancer
3. Receiving chemotherapy – Every 2 cycles (6 to 8 weeks)
4. Receiving maintenance therapy or immunotherapy – Every 3 months
5. To establish a post-treatment baseline, after completion of chemotherapy, radiation therapy or surgery
6. Recurrence suspected or biopsy proven
7. Surveillance – CT scan abdomen is not indicated for routine surveillance in asymptomatic individuals

B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

XXXIV. Small Cell Lung Cancer
A. CT scan Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
   1. Monitoring response to chemotherapy for locally advanced, unresectable or metastatic cancer – Every 2 cycles (6 to 8 weeks)
   2. To establish a post-treatment baseline, after completion of chemotherapy, radiation therapy or surgery
   3. Recurrence suspected or biopsy proven
   4. Surveillance – CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen without contrast (CPT® 74150) may be obtained every 4 months for the first 2 years, then every 6 months for 3 additional years and then annually
B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging of newly diagnosed small cell lung cancer
   2. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
      a. Prior involvement of pelvis with cancer
      b. New/worsening signs or symptoms related to the pelvis

XXXV. Malignant Mesothelioma
Malignant Pleural Mesothelioma:
A. CT scan Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to chemotherapy for locally advanced, unresectable disease - Every 2 cycles (6 to 8 weeks)
   3. To establish a post-treatment baseline, after completion of induction chemotherapy and prior to surgical resection
   4. Recurrence suspected or biopsy proven
   5. Surveillance – CT scan abdomen is not indicated for routine surveillance in asymptomatic individuals
B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
1. Prior involvement of pelvis with cancer
2. New/worsening signs or symptoms related to the pelvis

Primary Peritoneal Mesothelioma:
C. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
1. Initial staging
2. Monitoring response to chemotherapy – every 2 cycles (6 to 8 weeks)
3. Suspected recurrence
4. Surveillance – every 3 months for 2 years, and annually thereafter

XXXVI. Neuroendocrine tumors (low-grade)

Neuroendocrine tumors (NET) can arise from gastrointestinal, lung, thymus, pancreatic or adrenal primary sites and may have elevation of various tumor markers such as chromogranin A, 5HIAA, insulin, VIP, glucagon, gastrin, substance P, serotonin, somatostatin.

Depending on the site of origin, either CT scan Abdomen with contrast (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) would be the preferred test to evaluate.

A. Bronchopulmonary carcinoid or thymic NET
CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
1. Suspected diagnosis
   a. Elevated urine 5HIAA >15mg/24hr
   b. Elevated chromogranin A (CgA) >39ng/L
   c. Elevated substance P >270 ng/L or pg/mL
   d. Elevated gastrin >100pg/mL
   e. Elevated serotonin >330mcmol/L
2. Initial staging
3. Monitoring response to treatment for known abdominal metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months
4. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers
5. Surveillance – CT Abdomen and Pelvis is not routinely indicated for surveillance of asymptomatic individuals

B. Gastric/duodenal/jejunal/ileal/appendiceal/pancreatic NET
CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:

1. Suspected diagnosis of Carcinoid syndrome (one of the following)
   a. Elevated urine 5HIAA >15mg/24hr
   b. Elevated chromogranin A (CgA) >39ng/L
   c. Elevated substance P >270 ng/L or pg/mL
   d. Elevated gastrin >100pg/mL
   e. Elevated serotonin >330mcmol/L

2. Suspected Gastrinoma or Zollinger-Ellison syndrome (one of the following)
   a. Elevated serum gastrin >100pg/m
   b. Positive secretin test

3. Suspected Insulinoma (one of the following)
   a. Elevated serum C peptide
   b. Fasting blood glucose of <40mg/dL
   c. Elevated serum insulin >2.0ng/ml

4. Suspected Glucagonoma (one of the following)
   a. Elevated serum glucagon >100pg/ml

5. Suspected VIPoma (one of the following)
   a. Elevated vasoactive intestinal polypeptide (VIP) >70pg/ml

6. Suspected Somatostatinoma (one of the following)
   a. Elevated somatostatin

7. Initial staging of newly diagnosed Neuroendocrine tumor

8. Monitoring response to treatment for unresectable or metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months

9. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers

10. Surveillance:
   a. NET of small and large bowel - CT Abdomen and Pelvis with contrast (CPT® 74177) once at 3-12 months post-operatively, and then annually for 10 years
   b. NET of pancreas or stomach - CT Abdomen with contrast (CPT® 74160) once at 3-12 months post-operatively, and then annually for 10 years

C. Pheochromocytoma/paraganglioma
   CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:

1. Suspected pheochromocytoma or paraganglioma (one of the following)
   a. Fractionated metanephrines in plasma > 3-4 times the upper laboratory limit
   b. 24 hour urinary total metanephrine >1800µg
c. Clonidine suppression test positive (plasma norepinephrine is > 500pg/ml or > 2.96nmol/L or < 50% decrease in plasma norepinephrine) if fractionated metanephrines are above normal but less than 4 times the upper limit of normal

d. Suspicion of pheochromocytoma in individual with MEN2, von Hippel-Lindau syndrome and neurofibromatosis type 1 (NF-1) if the blood and urine tests are not abnormal

2. Initial staging of newly diagnosed pheochromocytoma

3. Monitoring response to treatment for unresectable or metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months

4. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers

5. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

D. Adrenocortical carcinoma
   CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment for unresectable or metastatic disease:
      a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
      b. Patients receiving somatostatin analogues – every 3 months
   3. Suspected recurrence based on one of the following:
      a. New symptoms
      b. Rising tumor markers
   4. Surveillance - CT Abdomen with contrast (CPT® 74160) once within the first year post-resection and then annually for 10 years

XXXVII. Extrathoracic Small Cell Carcinoma (High grade Neuroendocrine carcinoma)
   CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   A. Initial staging
   B. Monitoring response to chemotherapy for unresectable or metastatic disease every 2 cycles (6 to 8 weeks)
   C. Recurrence – suspected or biopsy proven
   D. Surveillance – CT Abdomen and Pelvis with contrast (CPT® 74177) every 3 months for 1 year, then every 6 months for 4 additional years and then annually thereafter

XXXVIII. Esophageal cancer
   A. CT scan Abdomen with contrast (CPT® 74160) may be obtained for one of the following:
      1. Initial staging
2. Monitoring response to chemotherapy for locally advanced, unresectable disease - Every 2 cycles (6 to 8 weeks)
3. To establish a post-treatment baseline, after completion of primary chemotherapy and/or radiation therapy and prior to surgical resection
4. Recurrence suspected or biopsy proven
5. Surveillance
   a. Stage 0 - I – no routine advanced imaging is indicated
   b. Stage II - III – CT scan Abdomen with contrast (CPT® 74160) every 6 months for 3 years
   c. Stage IV with measurable abdominal metastases – every 3 months for 5 years

B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

XXXIX. Gastric Cancer
A. CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
   1. Initial staging
   2. To establish a post-treatment baseline, after completion of chemotherapy and/or radiation therapy and prior to surgical resection
3. Surveillance:
   a. Stage I (treated with resection alone)
      i. No routine imaging unless clinical signs/symptoms of recurrence
   b. Stage I treated with systemic therapy, Stages II-III and Stage IV - Metastatic disease (post definitive treatment of all measurable disease or being observed off therapy)
      i. CT Abdomen/Pelvis with contrast (CPT® 74177) annually for 5 years

B. CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen without and with contrast (CPT® 74170) may be obtained for one of the following:
   1. Recurrence – suspected or biopsy proven

XL. New liver lesions with primary site controlledHepatoma or Hepatocellular Carcinoma
Any ONE of the following studies may be obtained for evaluation of hepatocellular carcinoma for any indication listed below:
   1. CT Abdomen and Pelvis with contrast (CPT® 74177)
   2. CT Abdomen and Pelvis without and with contrast (CPT® 74178)
   3. CT scan Abdomen with contrast (CPT® 74160)
   4. CT scan Abdomen without and with contrast (CPT® 74170)
   5. MRI Abdomen without and with contrast (CPT® 74183) and MRI Pelvis without and with contrast (CPT® 72197)
B. Initial staging
C. After completion of initial therapy
D. Monitoring response to treatment
   1. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
   2. Patients receiving immunotherapy – every 3 months
   3. Immediately prior to and 1 month post-ablation
E. For suspected recurrence
   1. New signs or symptoms
   2. New liver lesions
   3. Rising LFTs or AFP
F. Surveillance – every 3 months for 2 years, and then annually thereafter

**XLI. Gall Bladder Cancer and Cholangiocarcinoma**

A. CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen without and with contrast (CPT® 74170) may be obtained for one of the following:
   1. Initial staging
   2. CT Abdomen and Pelvis with contrast (CPT® 74177) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) may also be approved for this indication.
   3. After completion of initial chemotherapy to establish post-treatment baseline
   4. For suspected recurrence
      a. New signs or symptoms
      b. New liver lesions
      c. Rising LFTs
   5. Monitoring response to chemotherapy every 2 cycles (6 to 8 weeks)
   6. Surveillance – every 6 months for 2 years and then annually thereafter

B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained (instead of CT abdomen alone) if criteria listed above in A. are met and the patient has one of the following:
   1. Prior involvement of pelvis with cancer
   2. New/worsening signs or symptoms related to the pelvis

**XLII. Pancreatic Cancer**

A. CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen without and with contrast (CPT® 74170) may be obtained for one of the following:
   1. Screening patients at high risk of pancreatic cancer (to begin at age 40 or 10 years younger than the youngest affected family member) with any one of the following risk factors:
      a. Family history of familial cancer syndromes (including Peutz-Jeghers Syndrome, Hereditary Breast and Ovarian Cancer Syndrome, Familial Atypical Multiple Mole-Melanoma Syndrome (FAMMM), Familial Adenomatous Polyposis)
      b. Hereditary pancreatitis
      c. Familial pancreatic cancer ((two or more first degree relatives or any combination of 3 or more first/second degree relatives)
d. Hereditary pancreatic neuroendocrine tumors (Multiple Endocrine Neoplasia Type I [MEN-1], von Hippel-Lindau disease, neurofibromatosis Type 1, tuberous sclerosis)

2. Suspected diagnosis of pancreatic cancer based on symptoms, abnormal labs or physical exam findings or abnormal US/ERCP

B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging of newly diagnosed pancreatic cancer
   2. After completion of neoadjuvant chemotherapy or definitive chemotherapy and/or radiation therapy to establish a new post-treatment baseline
   3. Monitoring response to chemotherapy in locally advanced/unresectable disease – Every 2 cycles (6 to 8 weeks)
   4. For suspected recurrence
      a. New signs or symptoms
      b. New liver lesions
      c. Rising LFTs or tumor markers
   5. Surveillance – every 3 months for 2 years and then annually thereafter

XLIII. Colon Cancer
A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment for locally advanced, unresectable or metastatic cancer
      a. Receiving chemotherapy – Every 2 cycles (6 to 8 weeks)
      b. Receiving maintenance therapy or immunotherapy – Every 3 months
   3. Recurrence suspected
      a. New signs or symptoms
      b. New liver lesions
      c. Rising LFTs or tumor markers
   4. Surveillance
      a. Stage I – no routine advanced imaging is indicated
      b. Stage II-III – Annually for 5 years
      c. Stage IV – Every 6 months for 2 years and then annually for 3 more years

XLIV. Rectal Cancer
A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment for locally advanced, unresectable or metastatic cancer
      a. Receiving chemotherapy – Every 2 cycles (6 to 8 weeks)
      b. Receiving maintenance therapy or immunotherapy – Every 3 months
   3. Recurrence suspected
      a. New signs or symptoms
      b. New liver lesions
c. Rising LFTs or tumor markers

4. Surveillance
a. Stage I – no routine advanced imaging is indicated
b. Stage II-III – Annually for 5 years
c. Stage IV – Every 6 months for 2 years and then annually for 3 more years

XLV. Anal Cancer
A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging
      a. Alternatively, CT scan Abdomen with contrast (CPT® 74160) and MRI Pelvis without and with contrast (CPT® 72197) could be approved for this indication
   2. Monitoring response to chemotherapy
      a. Stage I and II – no routine advanced imaging during chemoradiation
      b. Stage III and IV – every 2 cycles (6 to 8 weeks)
   3. After completion of chemotherapy and/or radiation therapy to establish a new post-treatment baseline
   4. Surveillance
      a. Stage I and II – no routine advanced imaging is indicated
      b. Stage III and IV – annually for 3 years

XLVI. Bone Cancers
Osteosarcoma
A. CT Abdomen and Pelvis with contrast (CPT® 74177) is not routinely indicated for evaluation of osteosarcoma, but can be approved for one of the following:
   1. Primary site of abdomen or pelvis
   2. Evaluation of inconclusive findings on other imaging studies, such as PET
   3. New signs or symptoms related to the abdomen and/or pelvis

Ewing’s sarcoma
B. CT Abdomen and Pelvis with contrast (CPT® 74177) is not routinely indicated for evaluation of osteosarcoma, but can be approved for one of the following:
   1. Primary site of abdomen or pelvis
   2. Evaluation of inconclusive findings on other imaging studies, such as PET
   3. New signs or symptoms related to the abdomen and/or pelvis

Chondrosarcoma
C. CT Abdomen and Pelvis with contrast (CPT® 74177) is not routinely indicated for evaluation of osteosarcoma, but can be approved for one of the following:
   1. Primary site of abdomen or pelvis
   2. Evaluation of inconclusive findings on other imaging studies, such as PET
   3. New signs or symptoms related to the abdomen and/or pelvis

Chordoma
D. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
1. Initial staging
2. Monitoring response to chemotherapy – only if abdomen/pelvis previously involved with disease – every 2 cycles (6 to 8 weeks)
3. Surveillance - CT scan Abdomen with contrast (CPT® 74160) annually for 10 years

XLVII. Soft tissue Sarcoma
A. Sarcoma may present with any of the following histologies: Myxoid/round cell liposarcoma, epithelioid sarcoma, angiosarcoma, leiomyosarcoma, endometrial stromal sarcoma, rhabdomyosarcoma, clear cell sarcoma, hemangiopericytoma and undifferentiated sarcoma.

B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
1. Initial staging for one of the following:
   a. Retroperitoneal or intra-abdominal primary site
   b. Angiosarcoma
   c. Alveolar soft part sarcoma
   d. Clear cell sarcoma
   e. Epithelioid sarcoma
   f. Hemangiopericytoma
   g. Leiomyosarcoma
   h. Uterine soft tissue sarcoma
   i. Myxoid round cell sarcoma
   j. Rhabdomyosarcoma with one of the following:
      i. Primary site of abdomen or pelvis
      ii. Lower extremity primary site
      iii. Evaluation of inconclusive findings on other imaging studies, such as PET
      iv. New signs or symptoms related to the abdomen and/or pelvis
   k. Kaposi’s Sarcoma
      i. Initial staging if extra-cutaneous visceral disease is suspected
      ii. Further imaging indicated to follow up on previously seen abnormalities or new signs/symptoms related to the abdomen/pelvis
2. Restaging after completion of primary treatment – chemotherapy, surgery or radiation therapy, if abdomen/pelvis were previously involved
3. Monitoring response to chemotherapy – if abdomen/pelvis previously involved with disease – every 2 cycles (6 to 8 weeks)
4. Surveillance for one of the following:
   a. Retroperitoneal or intra-abdominal primary site
   b. Stage II or higher sarcoma with prior involvement of abdomen/pelvis
      i. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained every 3 months for 2 years, every 6 months for 2 more years and then annually thereafter
XLVIII. **Gastrointestinal Stromal Tumor (GIST)**
   A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
      1. Suspected diagnosis
      2. Initial staging
      3. Monitoring response to treatment for locally advanced, unresectable or metastatic GIST
         a. Receiving chemotherapy – Every 2 cycles (6 to 8 weeks)
         b. Receiving maintenance therapy or immunotherapy – Every 3 months
      4. Recurrence suspected
         a. New signs or symptoms
         b. New liver lesions or rising LFTs
      5. Surveillance – every 6 months for 5 years and then annually thereafter

XLIX. **Melanoma**
   A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
      1. Initial staging (either CT or PET may be obtained for this indication, NOT both)
         a. Stage III (palpable regional nodes or sentinel node positive)
         b. Stage IV (metastatic)
         c. Melanoma in transit
         d. Mucosal melanoma (including lip)
         e. Ocular or orbital melanoma
         f. Stage I or II melanoma, if there are signs or symptoms concerning for lung metastases or chest x-ray abnormalities
      2. Monitoring response to treatment for known unresectable or metastatic disease
         a. Receiving chemotherapy – Every 2 cycles (6 to 8 weeks)
         b. Receiving maintenance therapy or immunotherapy – Every 3 months
      3. Suspected recurrence – biopsy proven or clinically suspected
      4. Surveillance
         a. Stage IA, IB and IIA – no routine advanced imaging is indicated
         b. Stage IIB, IIA and IIIB – Every 6 months for 5 years
         c. Stage IIIC and IV – Every 3 months for 3 years, then every 6 months for 2 years
         d. Ocular/Orbital Melanoma - Every 6 months for 2 years, then annually for 3 years

L. **Merkel Cell Carcinoma**
   A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
      1. Initial staging
      2. Monitoring response to chemotherapy – every 2 cycles (6 to 8 weeks)
      3. Suspected or biopsy proven recurrence
      4. Surveillance – only for node positive – every 6 months for 5 years
LI. Breast Cancer
A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
B. Initial staging
   1. Clinical stages III and IV
   2. Clinical stages I and II, if there are signs or symptoms concerning for distant metastases
C. Monitoring response to treatment only for known metastatic disease:
   1. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
   2. Patients receiving hormonal therapy – every 3 months
D. Suspected recurrence [One of the following]
   1. Biopsy proven recurrence
   2. New signs or symptoms concerning for metastatic disease
   3. Rising tumor markers such as CEA, CA 15-3, CA27.29
   4. Rising laboratory studies - hypercalcemia, elevated LFTs
E. Surveillance
   1. For known measurable metastatic disease, CT scan may be obtained every 3 months while on treatment break or on maintenance therapy for up to 5 years.
   2. Routine advanced imaging is NOT indicated for:
      a. Initial staging of non-invasive or in-situ breast cancer
      b. Prior to lymph node sampling in Clinical stage I, II or III breast cancer
      c. After complete resection of primary tumor
      d. Before, during or after completion of adjuvant chemotherapy, adjuvant radiation therapy and/or adjuvant hormonal therapy for non-metastatic breast cancer

LI. Renal cell or Kidney carcinoma
A. CT Abdomen and Pelvis with contrast (CPT® 74177) be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to treatment only for known metastatic disease:
      a. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
      b. Patients receiving immunotherapy – every 3 months
   3. Suspected recurrence
   4. Surveillance of metastatic cancer with persistent measurable disease, not on treatment – every 3 months
B. CT scan Abdomen with contrast (CPT® 74160) or CT scan Abdomen without contrast (CPT® 74150) may be obtained for Surveillance, for one of the following:
   1. Active surveillance (no treatment)
      a. Once within 6 months of initiation of surveillance (either CT or MRI can be approved for this indication, contrast as requested)
      b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775) annually for 5 years, CT abdomen or MRI may be obtained only for:
         i. New or worsening abdominal signs/symptoms
         ii. New or worsening ultrasound abnormalities
2. Stage I/II cancer treated with Ablation therapy
   a. Once within 3-6 months post-ablation (either CT or MRI may be obtained for this indication)
   b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775) annually for 5 years, CT or MRI abdomen may be obtained only for:
      i. New or worsening abdominal signs/symptoms
      ii. New or worsening ultrasound abnormalities
      iii. Suspicious abnormality on post-ablative CT scan
3. Stage I cancer treated with partial or complete nephrectomy
   a. Once within 3-12 months post-resection
   b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775) annually for 3 years, CT or MRI abdomen may be obtained only for:
      i. New or worsening abdominal signs/symptoms
      ii. New or worsening ultrasound abnormalities
      iii. Suspicious abnormality on post-operative CT scan
4. Stage II cancer treated with nephrectomy
   a. Once within 3-6 months post-resection
   b. Thereafter, Abdominal ultrasound (CPT® 76770 or CPT® 76775) every 6 months for 3 years, then annually for 2 more years. CT or MRI abdomen may be obtained only for:
      i. New or worsening abdominal signs/symptoms
      ii. New or worsening ultrasound abnormalities
      iii. Suspicious abnormality on post-operative CT scan
5. Stage III cancer treated with nephrectomy
   a. CT Abdomen within 3 to 6 months post-resection, then every 3 months for 3 years, then annually up to year 5
6. Stage IV/Metastatic cancer with no measurable disease
   a. CT Abdomen within 3 to 6 months post-resection, then every 3 months for 3 years, then annually up to year 5

LIII. Transitional cell cancer [arising from the bladder, ureters, prostate, urethra and renal pelvis]
   A. CT Abdomen and Pelvis with contrast (CPT® 74177) or CT scan Abdomen and Pelvis without and with contrast (CPT® 74178) may be obtained for one of the following:
      1. Initial staging
      2. After completion of neoadjuvant chemotherapy and/or radiation therapy and prior to surgical resection
      3. After definitive surgical resection of any muscle invasive bladder cancer
      4. Suspected recurrence of muscle invasive bladder cancer
      5. Monitoring response to chemotherapy for locally advanced, unresectable or metastatic cancer – every 2 cycles (6 to 8 weeks)
      6. Surveillance
         a. Superficial and minimally invasive (Tis and T1) transitional cell cancer of the bladder and upper urinary tract – CT urogram (CPT® 74178) every 2 years for 10 years

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b. Minimally invasive transitional carcinoma of the bladder treated with cystectomy - CT urogram (CPT® 74178) at 3 months post cystectomy, and then annually for 5 years

c. Muscle invasive transitional cell cancer of the bladder and upper urinary tracts – every 3 months for 2 years, then annually for 3 additional years

d. Urethral cancers and urothelial carcinoma of the prostate – every 3 months for 2 years and then annually

LIV. Prostate Cancer

A. CT Pelvis with contrast (CPT® 72193) or MRI Pelvis without and with contrast (CPT® 72197) be obtained for one of the following:

1. Initial staging of newly diagnosed Prostate cancer only for one of the following:
   a. Gleason score ≥ 7
   b. PSA >20
   c. Gleason score of 6 with one of the following:
      i. Tumor involving >50% of one lobe (T2b)
      ii. Tumor involving both lobes (T2c)
      iii. PSA >10

B. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:

1. Initial staging of newly diagnosed prostate cancer (in addition to either CT or MRI of the pelvis) for one of the following:
   a. PSA >20
   b. Elevated creatinine for age
   c. Hematuria not related to prostate biopsy
   d. Lymphadenopathy or extraprostatic disease noted on pelvic imaging

2. Restaging for suspected recurrence/progression
   a. Patient on hormonal therapy and having 2 consecutive rise in PSA levels
   b. Patients treated with radical prostatectomy and one of the following:
      i. Palpable anastomotic recurrence
      ii. PSA remains >0.2 after at least 2 PSA checks
      iii. Initially undetectable PSA rises on 2 consecutive measurements
   c. Patients treated with radiation therapy and one of the following:
      i. Clinical concern for progression based on exam findings
      ii. PSA rises on 2 consecutive measurements above the post-radiation therapy baseline
   d. Clinical suspicion for relapse based on physical exam findings or PSA
   e. Hormone-refractory prostate cancer on treatment
      i. Treatment with chemotherapy – every 2 cycles (6 to 8 weeks)
      ii. Treatment with anti-androgen therapy – every 3 months
   f. Prior to starting Xofigo (Radium-223) therapy

3. Surveillance – CT or MRI scan is not used routinely to monitor patients who are being followed on Active Surveillance protocol or those that have received treatment and are being monitored off therapy.
LV. Testicular Cancer – Pure Seminoma
A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
1. Initial staging (after orchiectomy is completed)
2. At the completion of chemotherapy, radiation therapy or surgery to establish a new post-treatment baseline
3. Monitoring response to chemotherapy for stages II-IV receiving treatment – every 2 cycles (6 to 8 weeks)
4. Recurrence suspected based on one of the following:
   a. Rising tumor markers
   b. Signs or symptoms concerning for progression
5. Surveillance
   a. Stage I seminoma treated with orchiectomy alone (Active Surveillance, no chemotherapy or radiotherapy given) – at 3, 6 and 12 months post-orchiectomy, and then annually till year 5
   b. Stage I seminoma treated with radiotherapy and/or chemotherapy – once at 3 months after completion of treatment, then at 6-12 months, and then annually till year 3
   c. Stage IIB, IIC, III and IV seminoma with one of the following:
      i. Residual mass ≤3cm – once at 3-6 months after completion of all therapy, no further imaging indicated.
      ii. Residual mass >3 cm – at 6 and 12 months post completion of therapy and then annually till year 5

LVI. Testicular Cancer – Non-seminoma
A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
1. Initial staging (after orchiectomy is completed)
2. At the completion of chemotherapy, radiation therapy or surgery to establish a new post-treatment baseline
3. Monitoring response to chemotherapy for stages II-IV receiving treatment – every 2 cycles (6 to 8 weeks)
4. Recurrence suspected based on one of the following:
   a. Rising tumor markers
   b. Signs or symptoms concerning for progression
5. Surveillance
   a. Stage IA non-seminoma treated with orchiectomy alone (Active Surveillance, no chemotherapy or radiotherapy given) – at 6 and 12 months post-orchiectomy, and then annually till year 3
   b. Stage IB non-seminoma treated with orchiectomy alone (Active Surveillance, no chemotherapy or radiotherapy given) – every 4 months for 1 year, then every 6 months for 2 years and then annually until year 4
   c. Stage IB non-seminoma treated with chemotherapy – annually for 2 years
   d. Stage II-III non-seminoma with:
i. Complete response after chemotherapy, with/without post-chemo retroperitoneal lymph node dissection – at 6, 12 and 24 months after completion of all treatment

ii. Treated with primary retroperitoneal lymph node dissection with/without post-operative adjuvant chemotherapy – once at 3 to 4 months after completion of therapy

LVII. Ovarian Germ Cell tumors

A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging (after oophorectomy is completed)
   2. Monitoring response to chemotherapy only for known metastatic disease - every 2 cycles (6 to 8 weeks)
   3. Recurrence suspected based on one of the following:
      a. Rising tumor markers or LFTs
      b. Signs or symptoms concerning for metastases
   4. Surveillance – advanced imaging is not indicated for routine asymptomatic surveillance
   5. Advanced imaging is not indicated for sex cord stromal tumors (granulosa cell tumors)

LVIII. Extragonadal Germ Cell tumors

A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging
   2. Monitoring response to chemotherapy only for known metastatic disease - every 2 cycles (6 to 8 weeks)
   3. Recurrence suspected based on one of the following:
      a. Rising tumor markers or LFTs
      b. Signs or symptoms concerning for metastases
   4. Surveillance - advanced imaging is not indicated for routine asymptomatic surveillance

LIX. Ovarian Epithelial cancer

A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging – for clinical stage II and higher disease
   2. Monitoring response to treatment for known metastatic or unresectable disease:
      a. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
      b. Patients receiving immunotherapy or maintenance therapy– every 3 months
   3. Recurrence suspected based on one of the following:
      a. Difficult or abnormal examination
      b. Signs or symptoms concerning for metastases
      c. Rising LFTs
      d. Rising tumor markers (CA-125, inhibin)
4. Surveillance – advanced imaging is not indicated for routine asymptomatic surveillance

LX. Cervical Cancer

A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging
   2. Restaging after completion of primary (upfront) radiation therapy and/or chemotherapy
   3. Monitoring response to chemotherapy for known metastatic or unresectable disease – every 2 cycles (6 to 8 weeks)
   4. Recurrence suspected based on one of the following:
      a. Difficult or abnormal examination
      b. Signs or symptoms concerning for metastases
      c. Rising LFTs
   5. Surveillance – advanced imaging is not indicated for routine asymptomatic surveillance

LXI. Uterine Cancer

A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
   1. Initial staging [or CT scan Abdomen alone with contrast (CPT® 74160) if MRI pelvis is being obtained] for one of the following:
      a. High risk histologies such as:
         i. Papillary serous carcinoma
         ii. Clear cell carcinoma
         iii. Carcinosarcoma
         iv. Soft tissue sarcoma of the uterus
         v. Leiomyosarcoma
         vi. Undifferentiated sarcoma
         vii. Endometrial stromal sarcoma
   2. Clinical concern for abdominal metastases
      a. Signs or symptoms pertaining to abdomen
      b. Elevated LFTs
   3. Tumor detected incidentally or incompletely treated surgically and one of the following high risk features:
      a. Myoinvasion >50%
      b. Cervical stromal involvement
      c. Lymphovascular invasion
      d. Tumor >2 cm
   4. Monitoring response to treatment for known metastatic or unresectable disease:
      a. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
      b. Patients receiving immunotherapy or maintenance therapy – every 3 months
   5. Recurrence suspected based on one of the following:
      a. Difficult or abnormal examination
b. Signs or symptoms concerning for metastases
c. Rising LFTs

6. Surveillance - advanced imaging is not indicated for routine asymptomatic surveillance

**LXII. Squamous cell cancer of the external genitalia (vulva, vagina and penis)**

A. **CT Abdomen and Pelvis with contrast (CPT® 74177)** may be obtained for one of the following:
   1. Initial staging [or CT scan Abdomen alone with contrast (CPT® 74160) if MRI pelvis is being obtained]
   2. Monitoring response to chemotherapy for known metastatic or unresectable disease (Stage III and IV) – every 2 cycles (6 to 8 weeks)
   3. At the completion of all treatment to establish a new post-treatment baseline
   4. Recurrence suspected based on one of the following:
      a. Difficult or abnormal examination
      b. Signs or symptoms concerning for metastases
      c. Rising LFTs
      d. Biopsy proven recurrence

5. Surveillance:
   a. Stage III or higher Anal cancer – annually for 3 years
   b. Stage III or higher Penile cancer – every 3 months for 1 year, and then every 6 months for one additional year
   c. All others - advanced imaging is not indicated for routine asymptomatic surveillance

**LXIII. Leukemias**

CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:

A. Acute Leukemias:
   1. Initial staging – CT not routinely indicated, except for one of the following:
      a. Known or strongly suspected T-cell histology
      b. New abdominal signs or symptoms

B. For evaluation of extramedullary leukemia (granulocytic sarcoma)

C. Surveillance - advanced imaging is not indicated for routine asymptomatic surveillance

D. Chronic Myelogeneous Leukemia and Myeloproliferative Disorders:
   1. Routine advanced imaging is not indicated in the evaluation and management of chronic myeloid leukemias, myelodysplastic syndromes or myeloproliferative disorders in the absence of specific localizing clinical symptoms or clearance for hematopoietic stem cell transplantation.

E. Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma:
   1. Initial staging
   2. Monitoring response to chemotherapy only for patients with known bulky (> 5 cm) nodal disease at initial diagnosis- every 2 cycles (6 to 8 weeks)
3. End of therapy evaluation for patients with known bulky (> 5 cm) nodal
disease at initial diagnosis
4. Suspected recurrence or relapse
5. Surveillance - for patients with known bulky (> 5 cm) nodal disease at
initial diagnosis – every 6 months for 2 years, and then annually thereafter

**LXIV. Non-Hodgkin’s Lymphoma**

CT Abdomen and Pelvis with contrast (CPT® 74177) obtained for one of the
following:

A. Diffuse Large B cell and Grade III Follicular lymphoma:
   1. Suspected lymphoma
   2. Initial staging (either CT or PET or both may be approved for this
      indication)
   3. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
   4. End of therapy evaluation after completion of entire course of
      chemotherapy and/or radiation therapy (either CT or PET or both may be
      approved for this indication)
   5. Suspected or biopsy-proven recurrence
   6. Surveillance:
      a. Stage I and II – no routine advanced imaging indicated
      b. Stage III and IV – Every 6 months for 2 years

B. Grade I and II Follicular lymphoma:
   1. Suspected lymphoma
   2. Initial staging
   3. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
   4. End of therapy evaluation after completion of entire course of
      chemotherapy and/or radiation therapy (either CT or PET may be
      approved for this indication, not both)
   5. Suspected or biopsy-proven recurrence
   6. Surveillance: Every 6 months for 2 years and then annually

C. Marginal Zone and MALT lymphoma:
   1. Initial staging
   2. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
   3. End of therapy evaluation after completion of entire course of
      chemotherapy and/or radiation therapy (either CT or PET may be
      approved for this indication, not both)
   4. Suspected or biopsy-proven recurrence
   5. Surveillance
      a. Stage I and II – no routine advanced imaging indicated
      b. Stage III and IV – Every 6 months for 2 years and then annually

D. Mantle Cell lymphoma:
   1. Initial staging
   2. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
   3. End of therapy evaluation after completion of entire course of
      chemotherapy and/or radiation therapy (either CT or PET may be
      approved for this indication, not both)
   4. Suspected or biopsy-proven recurrence
5. Surveillance – Advanced imaging is not indicated for routine asymptomatic surveillance.

E. Burkitt’s lymphoma:
1. Initial staging
2. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
3. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET or both may be approved for this indication)
4. Suspected or biopsy-proven recurrence
5. Surveillance – Advanced imaging is not indicated for routine asymptomatic surveillance.

F. Cutaneous and T-cell lymphoma:
1. Suspected lymphoma
2. Initial staging (either CT or PET or both may be approved for this indication)
3. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
4. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET or both may be approved for this indication)
5. Suspected or biopsy-proven recurrence
6. Surveillance:
   a. Stage I and II – no routine advanced imaging indicated
   b. Stage III and IV – Every 6 months for 2 years

G. Primary CNS lymphoma:
1. Initial staging of newly diagnosed primary CNS lymphoma
2. CT abdomen and pelvis is not routinely indicated for monitoring treatment response or surveillance.

H. Castleman’s Disease:
1. Initial staging of unicentric and multicentric disease
2. Monitoring response to chemotherapy every 2 cycles (6-8 weeks) for:
   a. Multicentric disease
   b. Surgically unresected unicentric disease
3. Recurrence suspected based on one of the following:
   a. Rising LDH, IL-6 or VEGF levels
   b. Recurrent B symptoms
   c. New signs or symptoms concerning for recurrence
4. Surveillance – CT of previously involved areas every 6 months for up to 5 years

LXV. Hodgkin’s lymphoma
A. CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
1. Suspected lymphoma
2. Initial staging (either CT or PET or both may be approved)
3. Monitoring response to chemotherapy every 2 cycles (6-8 weeks) (either CT or PET may be approved)
4. End of therapy evaluation after completion of entire course of chemotherapy and/or radiation therapy (either CT or PET or both may be approved)
5. Suspected or biopsy-proven recurrence
6. Surveillance – At 6, 12 and 24 months after completion of all therapy

LXVI. Hematopoietic Stem Cell transplantation
CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
A. Immediately prior to transplant (within 30 days)
B. Routine advanced imaging is not indicated for asymptomatic post-transplant surveillance

LXVII. Metastatic Cancer from an Unknown Primary site
CT Abdomen and Pelvis with contrast (CPT® 74177) may be obtained for one of the following:
A. Evaluation of primary site when one of the following apply:
   1. Carcinoma found within a lymph node or organ known not to be the primary
   2. Sebaceous carcinoma of the skin
   3. Adenocarcinoma within axillary lymph node
   4. Metastases to the brain
   5. Pathological fracture of the bone
B. Monitoring response to chemotherapy every 2 cycles (6-8 weeks)
C. Surveillance imaging as per primary site

LXVIII. TAVR (transcatheter aortic valve replacement) planning

LXIX. Evaluation of congenital anomalies of the abdomen and pelvis
A. Evaluation of Congenital Anomalies of the Pelvis: Pelvic ultrasound (CPT® 76856 or CPT® 76857) and/or TV ultrasound (CPT® 76830) 3-D Rendering (CPT® 76376/CPT® 76377) may be approved as an add-on. Retroperitoneal ultrasound (CPT® 76770 or CPT® 76775) is indicated to evaluate for coexisting renal anomalies.
B. Pelvis MRI without and with contrast (CPT® 72197):
   1. Ultrasound defines a complex anomaly or is not definitive, or
   2. Requested for surgical planning

LXX. Gastroenteritis (CT abdomen and pelvis with contrast [CPT® 74177]) if:
A. Acute abdomen suggesting bowel obstruction, toxic megacolon (abdominal swelling, fever, tachycardia, elevated white blood cell count), or perforation
B. Persistent abdominal pain with failure of conservative treatment for 2 weeks

LXXI. Arteriovenous fistula with “high output” heart failure:
A. CT Chest with contrast (CPT® 71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) OR
B. CTA Chest (CPT® 71275) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) OR
C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) OR
D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)

LXXII. Lumbar and Lumbosacral Plexus
A. MRI Pelvis without and with contrast with fat suppression imaging (CPT® 72197) OR MRI Abdomen and Pelvis without and with contrast with fat suppression imaging (CPT® 74183 and CPT® 72197) OR if MRI is not available, CT Pelvis with contrast (CPT® 72193) OR CT Abdomen and Pelvis with contrast (CPT® 74177) can be considered after EMG/NCV based on whether the upper lumbar plexus (abdominal retroperitoneal space) or the lumbosacral plexus (pelvis), respectively, is involved based on:
   1. Malignant infiltration (EMG not required)
   2. Radiation plexopathy to r/o malignant infiltration
   3. Traumatic injury

LXXIII. Complex Adnexal Masses--Pre-Menopausal
A. If an ultrasound is indeterminate and malignancy is suspected, CT pelvis or MRI pelvis (CPT® 72197 or CPT® 72195 if pregnant) may be considered for preoperative planning if requested by the operating surgeon. Send to MD review
B. An ovarian mass suspicious for metastatic disease (e.g. from breast, uterine, colorectal or gastric cancer) should be evaluated based on the appropriate Oncology Imaging guideline.
   1. CT abdomen and pelvis with contrast (CPT® 74177) as a pre-operative study to evaluate for metastatic disease when cancer is known or suspected
   2. It can detect omental metastases, peritoneal implants, pelvic and periaortic lymph node enlargement, hepatic metastases and obstructive uropathy
   3. CT abdomen and pelvis without and with contrast (CPT® 74178) can be considered for suspected hepatic metastases and obstructive uropathy

LXXIV. Suspected pelvic abscess, pelvic inflammatory disease (PID)
A. Pelvic (CPT® 76856 or CPT® 76857) and/or TV (CPT® 76830) US is the initial study for imaging of pelvic inflammatory disease (PID)
B. CT abdomen and pelvis with contrast (CPT® 74177) or CT pelvis with contrast (CPT® 72193) when:
   1. US is indeterminate, or
   2. Extensive abscess formation as determined by ultrasound

LXXV. Molar Pregnancy and GTN
A. Individuals should undergo brain imaging (preferably MRI brain without and with contrast - CPT® 70553), CT abdomen and pelvis with contrast (CPT® 74177), and chest x-ray as a metastatic work up.
   1. Treatment is usually methotrexate.
2. Weekly HCG tests are performed until they fall to zero.

LXXVI. Kidney Transplant, Pre-transplant Imaging Studies

A. Individuals on the kidney transplant waiting list can undergo advanced imaging per that institution's protocol as long as the studies do not exceed the following:
   1. If stress test is positive for reversible ischemia, or if duration of diabetes is >25 years and patient has additional cardiac risk factors, then diagnostic left heart catheterization can be performed
   2. Carotid duplex study (CPT® 93880 bilateral study or CPT® 93882 unilateral study) if there is history of stroke, TIA, or if carotid bruit is present on exam
   3. Abdomen and pelvis CT (CPT® 74176 or CPT® 74177) or CTA of the Abdomen (CPT® 74175) one time

B. Kidney Transplant, Post-transplant
   1. Ultrasound of the transplanted kidney:
      a. Current ultrasound imaging protocols for the transplanted kidney commonly include a Doppler study and are coded as CPT® 76776
      i. Do not report non-invasive vascular codes CPT® 93975 and CPT® 93976 in conjunction with CPT® 76776
      b. Ultrasound of the transplanted kidney performed without duplex Doppler should be reported as a limited retroperitoneal ultrasound (CPT® 76775)

LXXVII. Trauma - Spleen

A. Ultrasound of the abdomen (CPT® 76700 or CPT® 76705) and pelvis (CPT® 76856 or CPT® 76857) or CT of the abdomen and pelvis without and with contrast (CPT® 74178) or with contrast are indicated in patients with blunt abdominal trauma with suspected splenic rupture or in patients with penetrating trauma to the left upper quadrant.

LXXVIII. Iliac Artery Aneurysm (IAA)

A. Evaluation of a suspected IAA should begin with ultrasound
   B. If ultrasound is equivocal, CT pelvis with contrast (CPT® 72193) may be performed
   C. Follow-up imaging studies can be performed annually
   D. Preoperative imaging if endovascular or open repair is being considered (CPT® 74177, 74178, or 74174)
   E. Post endovascular iliac repair (stent): (CPT® 72191, 72193, 72194, or 72198)
      1. 1 week
      2. 1 month
      3. 3 months
      4. 6 months
      5. Every 6 months thereafter

LXXIX. GI Bleeding

A. Endoscopy should be first step in evaluation for GI bleeding
   B. (CPT® 74174, 74175, or 74177) can be considered if any of the following is accompanied with GI bleeding:
1. Severe abdominal pain
2. Hemodynamic instability (shock)
3. Endoscopy is contraindicated or negative

**LXXX. Abdominal Lymphadenopathy** with clinical or laboratory findings suggesting benign etiology, and no history of malignancy:

A. 3-month follow-up CT Abdomen/Pelvis (CPT® 74177).
B. If no changes at 3 months, 2 additional follow-up scans (at 6 months and one year) can be approved.
C. If no changes by one year, the finding can be considered benign. No further imaging.
D. If a follow-up CT demonstrates a concerning change, biopsy should be performed. If biopsy is inconclusive, PET/CT (CPT® 78815) can be approved

**LXXXI. Right-Sided Varicocele** when there is suspicion for intra-abdominal pathology, may require advanced imaging with CT Abdomen and Pelvis with contrast (CPT® 74177)

**LXXI. Suspected Ovarian Cancer** with elevated CA-125 and Obstructive uropathy - CT Abdomen/Pelvis without and with contrast (CPT® 74178)

**LXXXIII. Pediatric Congenital Mesoblastic Nephroma**

A. Initial Staging - CT Abdomen and Pelvis with contrast (CPT®74177)
B. Treatment Response
   1. CT Abdomen and Pelvis with contrast (CPT®74177) following resection
   2. For preoperative chemotherapy, CT Abdomen and Pelvis with contrast (CPT®74177) approved every 2 cycles of therapy until surgery
C. Surveillance
   1. CT Abdomen and Pelvis with contrast (CPT®74177) or MRI Abdomen and Pelvis without and with contrast (CPT®74183 and CPT®72197) can be approved every 3 months for 1 year after completion of all therapy for patients with residual abnormalities present on post-operative imaging or inconclusive findings on ultrasound

**LXXXIV. Molar Pregnancy and Gestational Trophoblastic Neoplasia (GTN)**

A. CT abdomen and pelvis with contrast is indicated for initial staging to evaluate for metastatic disease

References:


81. Daniels CJ, Scali F. Clinical brief: recognition and treatment of the elusive sports hernia. Topics in Integrative Health Care, 2012; 3(3).


137. Ajani JA, D'Amico TA, Almhanna K et al, National Comprehensive Cancer Network (NCCN) Guidelines Version 1.2017. Gastric cancer, available at: https://www.nccn.org/professionals/physician_gls/pdf/gastric.pdf Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Gastric cancer V 1.2017. ©2017 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.


147. The Expert Panel on Urologic Imaging’s American College of Radiology (ACR) Appropriateness Criteria - Prostate Cancer Pretreatment Detection, Staging, and Surveillance, Variant 3, can be accessed at https://acsearch.acr.org/docs/69371/Narrative/


74181 MRI of the Abdomen without Gadolinium
74182 MRI of the Abdomen with Gadolinium
74183 MRI of the Abdomen without and with Gadolinium

I. Intra-Abdominal Mass detected by other means\textsuperscript{113-116} [CPT\textsuperscript{®} 74181 or 74183] (One of the following)
A. Mass is seen on prior imaging
B. Physical exam suggests a palpable mass

II. Evaluation of Chronic Liver Disease, regardless of etiology [One of the following]
A. Ultrasound demonstrating a liver mass greater than or equal to 1 cm
   1. Multiphase CT (either CPT\textsuperscript{®} 74160 or CPT\textsuperscript{®} 74170) or MRI (CPT\textsuperscript{®} 74183) should be performed
   2. If not characteristic of HCC, repeat (CT or MRI) or consider biopsy.
   3. If second advanced imaging is not diagnostic – then consider biopsy.
B. Advanced imaging may be appropriate if the US is technically limited by such factors as obesity, intestinal gas, or chest wall deformity.
C. For negative US with AFP > 20 AND a > 2X increase in AFP from the previous low point within the past year:
   1. MRI abdomen (CPT\textsuperscript{®} 74183) or CT abdomen (CPT\textsuperscript{®} 74170) can be approved, and if negative for a hepatic lesion, follow-up imaging resumes with US, unless further increases in AFP are documented
D. Planned TIPS (transjugular intrahepatic portosystemic shunt – relatively non-invasive procedure for portal hypertension)

III. Known or suspected pancreatitis with abdominal pain or pancreatic pseudocyst\textsuperscript{58-60} (CT) [One of the following]
A. Suspected acute pancreatitis with abdominal pain, (This should not be done sooner than 48-72 hours if the diagnosis is clear based on amylase and lipase levels. A scan performed less than 72 hours after presentation may underestimate the extent of the disease) [One of the following]
   1. Initial scan [One of the following] 48-72 hours after onset of symptoms
      a. Amylase >3 times the upper normal laboratory value
      b. Lipase >3 times the upper normal laboratory value
   2. Initial scan at onset of abdominal pain but serum amylase and lipase are not >3 times normal but with severe abdominal pain and epigastric pain that increases rapidly in severity and persists without any relief.
   3. Follow up scan 7-21 days after onset of symptoms with a confirmed diagnosis
B. Known pancreatitis with any of the following allows for repeat exams if present [One of the following]
   1. Hemodynamic instability
a. Falling hematocrit
b. Falling blood pressure
2. Aural temperature > 38.3°C or > 100.9°F
3. White blood cell count or leukocytosis of >12,000 cells/mm³
4. White blood cell count < 4000 cells/mm³
5. Retroperitoneal air on prior CT
6. Positive blood culture
7. Signs of peritonitis (rebound, or guarding or tenderness)
8. Poor oxygen saturation, signs of ARDS (adult respiratory distress syndrome)
9. Signs of renal failure rising BUN and creatinine

C. Suspected pancreatic pseudocyst [Both of the following]
   1. History [One of the following]
      a. Acute pancreatitis with onset at least 4 wks earlier
      b. Pancreatitis secondary to trauma (time irrelevant)
      c. Chronic pancreatitis
   2. Clinical findings [One of the following]
      a. Abdominal/back pain
      b. Abdominal tenderness
      c. Abdominal mass

D. Pancreatic Pseudocysts¹¹⁹-¹²⁰
   1. CT of the abdomen with contrast (CPT® 74160), or without and with contrast (CPT® 74170),¹² or abdominal MRI without and with contrast (CPT® 74183)
      a. Minial symptoms - every two weeks, up to six weeks total. Thereafter, every 4 weeks.
      b. Anytime symptoms worsen, including development of ascites or pleural effusion, increasing serum amylase, or if drainage of the cyst is planned

IV. Chronic pancreatitis with history of recurrent pancreatitis and abdominal pain and no definitive diagnosis with ultrasound or endoscopic ultrasound (not helpful for early diagnosis; only confirmation of diagnosis and surgical planning)⁶¹, ⁶²

V. Pancreatic Lesion (Incidental Pancreatic Cyst)¹¹⁹-¹²⁰
   A. Abdominal CT (CPT® 74170) preferably, thin slice or MRI with and without contrast (CPT® 74183) for any of the following:
      1. Every 12 months after the initial incremental finding if <1cm in size
      2. Every 6 to 12 months after the initial finding if 1-2 cm in size
      3. Every -6 months after the initial finding if greater than 2 cm in size
   B. The following lesions should be evaluated by endoscopic ultrasound (EUS) and MRCP
      1. Pancreatic lesions >3 cm; or,
      2. Pancreatic lesions of any size with concerning features (mural nodules, dilated duct, pain, positive cytology, jaundice, worsening diabetes, etc.).
C. Imaging for the evaluation of pancreatic cystic lesions should be MRI Abdomen (CPT® 74183) and/or MRCP due to its ability to better characterize the relationship of the cyst to the pancreatic duct. If a previous US or CT Abdomen has been performed, a request for an MRI can be approved to better characterize the lesion, without reference to the timeframe for follow-up imaging.

VI. MR Cholangiopancreatography (MRCP) [One of the following]
A. Suspected obstruction to flow of bile [One of the following]
   1. Biliary duct dilatation on US or other imaging
   2. Jaundice direct bilirubin >0.4 mg/dL
   3. Acute cholecystitis
B. Pancreatitis with abdominal pain which may radiate to the back [One of the following]
   1. Amylase >3 times the upper normal laboratory value
   2. Lipase >3 times the upper normal laboratory value
   3. Recurrent or chronic without obvious cause
   4. Occurring after trauma, surgery or instrumentation (including prior cholecystectomy or ERCP)
   5. Acute biliary pancreatitis
C. Evaluation of pseudocyst detected on prior imaging (The status of the pancreatic duct is a key determinant of how a pseudocyst is treated. If the pancreatic duct is intact, percutaneous drainage is likely to be effective. If the duct is disrupted percutaneous drainage will not provide definitive therapy and will convert the pseudocyst to a fistula.)
D. Tumor
   1. Evaluation of pancreatic or biliary ducts with known tumors of the pancreas, liver or suspected tumors of the biliary or pancreatic ducts on prior imaging
   2. Biliary cystadenoma or cystadenocarcinoma
E. Chronic pancreatitis with history of recurrent pancreatitis and abdominal pain which may radiate to the back [One of the following]
   1. Pathological secretin test
   2. Abnormal glucose tolerance test
   3. Steatorrhea
   4. Pancreatic calcifications on other imaging study
   5. Recurrent or persistent pseudocysts
F. Unsuccessful ERCP
G. Suspected congenital anomaly of the pancreaticobiliary tract such as but not limited to pancreas divisum, choledochal cyst, aberrant ducts
H. Altered biliary tract anatomy that precludes ERCP such as biliary enteric anastomosis, or gastrectomy
VII. Abdominal Aortic Aneurysm (AAA)\textsuperscript{156-158} (One of the following)

A. For non-obese patients, ultrasound (CPT\textsuperscript{®} 76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass

B. For obese patients, CT abdomen with contrast (CPT\textsuperscript{®} 74160) can be substituted for US using the same timeline as non-obese patient

C. One-time screening recommendations for AAA (Ultrasound (CPT\textsuperscript{®} 76775)
   1. Men age 65 to 75 who have smoked
   2. Women and non-smokers – no routine screening
   3. Medicare covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
      a. Family history of AAA
      b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime

D. Surveillance recommendations for AAA (Ultrasound (CPT\textsuperscript{®} 76775) :
   1. 2.6-2.9 cm → once at 5 years
   2. 3.0-3.4 cm → once at 3 years
   3. 3.5-4.4 cm → annually
   4. 4.5-5.4 cm → every 6 months

E. >5.4 cm. or aortic diameter has increased in size by 0.7 cm in six months or at least 1 cm in a year may undergo more frequent monitoring and should be evaluated by a Vascular Specialist

F. Preoperative imaging if endovascular or open repair of AAA is being considered (CPT\textsuperscript{®} 74177, 74178, 74175 or 72191)

G. New onset of back and/or abdominal pain in a patient with a known AAA (CPT\textsuperscript{®} 74177, 74178, 74175 or 72191)

H. Post Open Aortic Repair: (CPT\textsuperscript{®} 74177 or 74178)
   1. Every 3 years to screen for aneurysms in the remaining aorta

I. Post Endovascular (Stent) Aortic Repair: (CPT\textsuperscript{®} 74177 or 74178)
   1. 1 month
   2. 3 months if there was evidence of endoleak on the 1 month study
   3. 6 months
   4. 12 months
   5. Every year

VIII. Thoracic Aorta\textsuperscript{126-136}

NOTE: Thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians’ preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

<table>
<thead>
<tr>
<th>Table of Thoracic Aorta Imaging Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT\textsuperscript{®} 71275, CPT\textsuperscript{®} 74175, CPT\textsuperscript{®} 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT\textsuperscript{®} 71555, CPT\textsuperscript{®} 74185, CPT\textsuperscript{®} 72198)</td>
</tr>
</tbody>
</table>
A. Aortic Dissection
1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
   a. “Medically” treated
      i. Every 6 months if total aortic diameter is \( \geq 4.5 \) cm
      ii. Annually if total aortic diameter is \( < 4.5 \) cm
   b. Surgery or Stent for any type of dissection
      i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc.) abnormality.
2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
   a. “Medically” treated/observation
      i. 3.5 to 4.4 cm TAA can be followed annually
      ii. \( \geq 4.5 \) TAA can be followed every 6 months
      iii. \( \geq 3.0 \) cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
   b. Surgery or Stent
      i. Preoperative open or endovascular (stent) repair imaging is appropriate
      ii. Suspicion of endoleak
      iii. Open repair imaging every 3-5 years
   c. Endovascular graft/stent
      i. First year: 1 month, 3 months, 6 months, 12 months, then annually
4. Screening with abdominal aortic Aneurysm (AAA)
   a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)
   b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes
1. Screening for Familial Syndromes and Genetic Syndromes
   a. Suspected Familial Thoracic Aortic Aneurysm
      i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all First-degree relatives (parents, siblings, children) of patients with TAA and/or dissection
      b. Any imaging listed can be performed if these studies identify a TAA or are equivocal or do not visualize the ascending aorta adequately
   c. Follow-Up per TAA Follow-Up guidelines
2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
   a. **Suspected**, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the time of diagnosis.
   b. **Follow-up**
      i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve
   1. Screening for Bicuspid Aortic Valve
      a. **Suspected**, any requested imaging from the “**Table of Thoracic Aorta Imaging Options**” and/or ECHO (CPT® 93306, CPT® 93307, or CPT® 93308)
         i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is NOT generally indicated.
         ii. There is no evidence-based data to support screening relatives of patients with bicuspid aortic valve.
      b. **Follow-up** per TAA Follow-Up guidelines
         i. If no dilation for the aortic root or ascending thoracic aorta is found, there is no evidence-based data to support continued surveillance imaging

IX. **Soft tissue mass of the abdominal wall**[^79,113] [CPT® 74181 or 74183] (One of the following)
   A. If ultrasound and/or CT are equivocal
   B. For preoperative planning

X. **MR Enterography**[^80-82] (CT) [One of the following]
   A. Bowel obstruction
   B. Celiac disease
   C. Polyposis syndromes
   D. Small bowel tumor
   E. Suspected Crohn’s disease [One of the following]
      1. Abdominal pain and diarrhea for more than 6 weeks
      2. Aural temperature >38.3°C or >100.9°F
      3. Perianal fistula or fissure
      4. Enterovesical fistula
      5. Enterovaginal fistula
      6. Enterocutaneous fistula
      7. Children with unexplained anemia, growth failure, and abdominal pain
   F. Known Crohn’s disease [One of the following]
      1. Mass on abdominal, pelvic or rectal exam
      2. Aural temperature >38.3°C or >100.9°F
      3. Leukocytosis, WBC >11,500/cu.mm
      4. Guarding
      5. Rebound
      6. Follow-up during or after treatment [One of the following]
7. Condition unimproved or worsening after drainage and IV antibiotics for at least two days
8. Condition unimproved or worsening after IV Abx Rx >1 wk
9. Routine follow-up study after treatment, including evaluation for removal of drain
10. Fistula
11. Small bowel obstruction
12. Perianal fistula
13. Stricture or stenosis
14. Any evidence of clinical deterioration while on steroids or immunosuppressives

G. Gastrointestinal Bleeding
   CT Abdomen and Pelvis w/contrast, CT Enterography, or MR Enterography (if CT enterography is contraindicated). CT Enterography should be considered the test of choice given the lack of motion artifact and its superior spatial resolution.
   1. if small bowel video capsule endoscopy is negative, or
   2. for further evaluation of abnormal video capsule findings

XI. Jaundice
   A. Ultrasound (CPT® 76700 or CPT® 76705) is the preferred initial imaging study to visualize the biliary ductal system when pain is present. Ultrasound often demonstrates the level and cause of any obstruction.
   B. Abdomen CT without and with contrast (CPT® 74170) or Abdomen CT with contrast (CPT® 74160) should be considered in the following scenarios:
      1. If non-diagnostic or equivocal ultrasound (e.g., large amounts of intestinal gas)
      2. Patient is obese
      3. Painless jaundice
      4. Acute abdominal pain and one of the following:
         a. Fever
         b. Previous biliary surgery
         c. Known cholelithiasis
      5. If there is high pretest probability of obstruction due to malignancy
   C. MR Cholangiopancreatography (MRCP) may be used to assess the extent and cause of intrahepatic bile duct obstruction
      1. Suggested by either ultrasound or CT if further characterization is warranted.
      2. Contraindications to the use of IV contrast for CT imaging

XII. Unilateral leg edema with venous Doppler excluding venous insufficiency or varicose veins [One of the following]
   A. Acute unilateral edema [One of the following]
      1. D-dimer <500 ng/ml and low suspicion of deep venous thrombosis
      2. No evidence of ruptured Baker’s cyst or injury to the gastrocnemius muscle
   B. Chronic unilateral edema
1. No evidence of reflex sympathetic dystrophy

XIII. New renal mass suspected or detected prior imaging\(^3\) (For renal cell cancer see below) (CT) [One of the following]
A. Initial evaluation of mass seen on prior imaging ultrasound or CT and request is for “renal protocol” (CT of the abdomen, CPT code 74150 or 74160 or 74170)
B. Cystic or solid mass detected on ultrasound
   1. Simple cyst confirmed on prior CT to be simple cyst or Bosniak class I cyst – no further imaging is indicated
C. Bosniak Class II cyst on prior CT (or MRI) (CT of the abdomen, CPT code 74150)
   1. Every 6 months for 3 years and if stable no further imaging

XIV. Suspected adrenal disease or mass
   See CT of the abdomen and pelvis, CPT codes 74176, 74177 and 74178) MRI may be indicated for one of the following:
A. Carcinoid [One of the following]
   1. New diagnosis [One of the following]
      a. Elevated urine 5HIAA >15mg/24hr
      b. Elevated chromogranin A (CgA) >39ng/L
      c. Elevated substance P >270 ng/L or pg/mL
      d. Elevated gastrin >100pg/mL
      e. Elevated serotonin >330mcmol/L

B. Islet cell tumor of the pancreas
   1. Gastrinoma or Zollinger-Ellison syndrome [One of the following]
      a. Elevated serum gastrin >100pg/m
      b. Positive secretin test
   2. Insulinoma [One of the following]
      a. Elevated serum C peptide
      b. Fasting blood glucose of <40mg/dL
      c. Elevated serum insulin >2.0ng/ml
   3. Glucagonoma [One of the following]
      a. Elevated serum glucagon >100pg/ml
   4. VIPoma
      a. Elevated vasoactive intestinal polypeptide (VIP) >70pg/ml
   5. Somatostatinoma
      a. Elevated somatostatin

C. Pheochromocytoma/paraganglioma
   a. Fractionated metanephrines in plasma >3-4 times the upper laboratory limit
   b. 24 hour urinary total metanephrine >1800µg
   c. Clonidine suppression test positive (plasma norepinephrine is >500pg/ml or >2.96nmol/L or <50% decrease in plasma norepinephrine) if fractionated metanephrines are above normal but less than 4 times the upper limit of normal
d. Suspicion of pheochromocytoma in individual with MEN2, von Hippel-Lindau syndrome and neurofibromatosis type 1 (NF-1) if the blood and urine tests are not abnormal

D. Functional Adrenal Tumors

CT Abdomen with contrast (CPT® 74160) may be obtained for one of the following:

1. Suspected Cushing's syndrome [One of the following]
   a. 24 hour urine free cortisol > 100 mcg/24 hr
   b. No suppression by dexamethasone

2. Suspected aldosteronoma or primary aldosteronism or Conn's syndrome [One of the following]
   a. Hypertension that is drug resistant (need for > 3 drugs)
   b. Spontaneous (<3.5 mEq/L) or severe diuretic-induced (< 3 mEq/L) hypokalemia
   c. Plasma aldosterone to renin ratio > 10 when aldosterone is measured in ng/dL
   d. 24 hour urinary aldosterone excretion test > 14µg/day

E. Incidental Adrenal lesion

To evaluate incidental finding on other imaging such as CT or MRI scan performed for other purposes (CT or MRI of the chest or heart), or US with no history of malignancy [One of the following]

1. Asymptomatic adrenal mass >1 cm
   a. No further imaging, regardless of size, if imaging is diagnostic for benign findings, including any of the following:
      i. Myelolipoma (macroscopic fat) or
      ii. Calcified mass or
      iii. < 10 HU on CT or decreased signal on Chemical Shift MRI (CS-MRI) consistent with benign adenoma, or
      iv. If imaging was completed with and without contrast and enhancement (defined as < 10 HU change between unenhanced and enhanced/contrasted CT scan e.g. cyst,hemorrhage).

2. Asymptomatic adrenal mass 1 to < 4 cm with indeterminate imaging on any CT or MRI and no prior imaging for comparison:
   a. 1 to 2 cm:
      i. 12 month CT Abdomen without and with contrast imaging (adrenal protocol) or may consider CS-MRI (chemical shift MRI), especially if CT contraindicated
      ii. If stable ≥ 1 year, no further imaging-likely benign
   b. > 2 cm to < 4 cm:
      i. CT Abdomen without and with contrast (adrenal protocol); may consider CS-MRI (chemical shift MRI), especially if CT Contraindicated
      ii. No further follow up imaging if:
          01. Absolute Percentage Washout/Relative Percentage Washout (APW/RPW) > 60/40% Benign adenoma;
02. No enhancement (defined as change in pre- and post-contrast imaging of <10 HU Cyst or hemorrhage

iii. If APR/RPW <60/40%:
  01. Consider 6-12 month follow up imaging, or
  02. Resection for possible primary adrenocortical carcinoma, with biochemical evaluation to determine functional status and to exclude pheochromocytoma prior to resection

03. If not resected, follow-up CT abdomen with and without contrast (or CS-MRI) in 6 – 12 months. May consider CS-MRI (chemical shift MRI), especially if CT contraindicated
  a. If enlarging on follow up imaging: Consider resection for possible primary adrenocortical carcinoma; biochemical evaluation to determine functional status and to exclude pheochromocytoma prior to resection.

3. No history of cancer or > 10 HU on NCCT and Asymptomatic adrenal mass ≥ 4 cm with indeterminate imaging on any CT or MRI:
   a. Biochemical assays to determine functional status to exclude pheochromocytoma prior to resection
   b. Consider resection for possible primary adrenocortical carcinoma

F. To evaluate incidental finding on other imaging such as CT or MRI scan performed for other purposes (CT or MRI of the chest or heart), or US WITH history of malignancy [One of the following]
   1. 1 cm to < 4 cm with indeterminate imaging on any CT or MRI and no prior imaging for comparison
      a. CT abdomen without and with contrast or May consider CS-MRI (chemical shift MRI
      b. No further follow up imaging if;
         i. APW/RPW > 60/40%; Benign adenoma; OR
         ii. No enhancement (defined as change in pre- and post-contrast imaging of <10 HU e.g. cyst or hemorrhage);
      c. APW/RPW < 60/40%:
         i. PET CT; consider biopsy;
         ii. Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection.
      d. If enlarging or new lesion:
         i. PET CT or biopsy;
         ii. Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection
   2. > 4 cm and Indeterminate imaging features on any CT or MRI
      a. PET CT or biopsy
      b. Consider biochemical assays to determine functional status and exclude pheochromocytoma prior to biopsy/resection

XV. Known low-grade neuroendocrine tumor/carcinoid tumor
    CT should be performed for evaluation of NET/carcinoid, MRI may be obtained if CT scan is inconclusive for one of the following:
     i. Adrenocortical NET or carcinoma
     ii. Gastrointestinal NET
iii. Pancreatic NET
iv. Pheochromocytoma/paraganglioma

A. Initial staging
B. Monitoring response to treatment for unresectable or metastatic disease:
   a. Patients receiving chemotherapy - every 2 cycles (6 to 8 weeks)
   b. Patients receiving somatostatin analogues – every 3 months
C. Suspected recurrence based on one of the following:
   a. New symptoms
   b. Rising tumor markers

XVI. Melanoma
CT should be performed for evaluation of melanoma, MRI of the Abdomen (CPT® 74183) may be obtained for one of the following:
1. Primary site is unknown and CT Chest and Abdomen/Pelvis are negative
2. Suspected or known liver metastases with one of the following:
   a. Inconclusive CT findings
   b. Considering limited resection or liver-directed therapy
   c. Monitoring of ablated liver metastases

XVII. Soft Tissue Sarcomas
CT should be performed for evaluation of Sarcoma, MRI of the Abdomen (CPT® 74183) may be obtained for one of the following:
1. Initial Staging - Any of the following:
   a. Retroperitoneal or intraabdominal primary sites
   b. Myxoid round cell liposarcoma
   c. Desmoid Tumors
   d. Angiosarcoma
   e. Alveolar soft part sarcoma
      i. Clear cell sarcoma
      ii. Epithelioid sarcoma
      iii. Hemangiopericytoma
      iv. Leiomyosarcoma
2. Suspected or known liver metastases with one of the following:
   a. Inconclusive CT findings
   b. Considering limited resection or liver-directed therapy
   c. Monitoring of ablated liver metastases

XVIII. Gastrointestinal Stromal Tumor (GIST) - CT should be performed for the evaluation of GIST, MRI Abdomen without and with contrast (CPT®74183) may be obtained for one of the following:
A. Initial Staging
B. Inconclusive CT findings

XIX. Pancreatic Cancer
A. CT should be performed for the evaluation of Pancreatic Cancer, MRI Abdomen without and with contrast (CPT®74183) may be obtained for one of the following:
1. Annual screening patients at high risk of pancreatic cancer (to begin at age 40 or 10 years younger than the youngest affected family member) with any one of the following risk factors:
   a. Family history of familial cancer syndromes (including Peutz-Jeghers Syndrome, Hereditary Breast and Ovarian Cancer Syndrome, Familial Atypical Multiple Mole-Melanoma Syndrome (FAMMM), Familial Adenomatous Polyposis)
   b. Hereditary pancreatitis
   c. Familial pancreatic cancer ((two or more first degree relatives or any combination of 3 or more first/second degree relatives)
   d. Hereditary pancreatic neuroendocrine tumors (Multiple Endocrine Neoplasia Type I [MEN-1], von Hippel-Lindau disease, neurofibromatosis Type 1, tuberous sclerosis)
2. Suspected diagnosis of pancreatic cancer based on symptoms, abnormal labs or physical exam findings or abnormal US/ERCP
3. Initial Staging - Preoperative planning or CT insufficient to determine resectability
4. Recurrence - Unexplained elevated liver enzymes or inconclusive recent CT abnormality

XX. Hepatoma or Hepatocellular Carcinoma
   1. Any ONE of the following studies may be obtained for evaluation of hepatocellular carcinoma for any indication listed below:
      a. CT Abdomen and Pelvis with contrast (CPT® 74177)
      b. CT Abdomen and Pelvis without and with contrast (CPT® 74178)
      c. CT scan Abdomen with contrast (CPT® 74160)
      d. CT scan Abdomen without and with contrast (CPT® 74170)
      e. MRI Abdomen without and with contrast (CPT® 74183) and MRI Pelvis without and with contrast (CPT® 72197)
   2. Initial staging
   3. After completion of initial therapy
   4. Monitoring response to treatment
      a. Patients receiving chemotherapy – every 2 cycles (6 to 8 weeks)
      b. Patients receiving immunotherapy – every 3 months
      c. Immediately prior to and 1 month post-ablation
   5. For suspected recurrence
      a. New signs or symptoms
      b. New liver lesions
      c. Rising LFTs or AFP
   6. Surveillance – every 3 months for 2 years, and then annually thereafter

XXI. Cholangiocarcinoma
   A. CT should be performed for the evaluation of cholangiocarcinoma, MRI Abdomen without and with contrast (CPT®74183) may be obtained for one of the following:
      1. Initial staging
      2. Suspected recurrence
3. New liver lesions identified on imaging
4. After completion of initial therapy
5. Monitoring response to systemic chemotherapy (every 2 cycles)

XXII. Known or suspected metastatic disease to the liver
A. Either, CT Abdomen without and with contrast (CPT® 74170) or MRI of the Abdomen (CPT® 74183) may be obtained for one of the following:
   1. Inconclusive CT findings
   2. New liver lesion (s) and primary site controlled
   3. Considering limited resection
   4. Monitoring of ablated metastases
      a. Immediately prior to ablation
      b. One month post ablation
      c. Every 3 months for 2 years then annually thereafter

XXIII. Colon cancer
A. CT should be performed for the evaluation of colon cancer. MRI of the Abdomen (CPT® 74183) may be obtained for one of the following:
   1. Inconclusive CT findings
   2. Postoperative elevated or rising CEA or LFT with negative recent conventional imaging
   3. Pseudomyxoma peritonei – surveillance with either CT or MRI every 3 months for the first year, then every 6 months for 4 additional years

XXIV. Rectal cancer
A. CT should be performed for the evaluation of rectal cancer. MRI of the Abdomen (CPT® 74183) may be obtained for one of the following:
   1. Inconclusive CT findings
   2. Postoperative elevated or rising CEA or LFT with negative recent conventional imaging

XXV. Cervical cancer
CT should be performed for the evaluation of cervical cancer. MRI of the Abdomen (CPT® 74183) may be obtained for one of the following:
A. Initial staging for clinical stage IB2 or higher and one of the following;
   1. Inconclusive CT findings
   2. Unable to receive CT contrast
B. Symptoms or examination findings suspicious for recurrence
C. After completion of primary radiation therapy +/- chemotherapy, for one of the following:
   1. Inconclusive CT findings
   2. Unable to receive CT contrast

XXVI. Endometrial cancer
CT should be performed for the evaluation of endometrial cancer. MRI of the Abdomen (CPT® 74183) may be obtained for evaluation of unresectable, medically inoperable, or incompletely surgically staged patients
XXVII. Anal cancer
CT should be performed for the evaluation of anal cancer. MRI of the Abdomen (CPT® 74183) may be performed for one of the following:
A. Suspected recurrence based on one of the following:
   1. Difficult or abnormal examination
   2. Elevated LFT
   3. Signs and symptoms of recurrence
   4. Biopsy proven recurrence
B. Surveillance – Only for stage III or greater – annually for 3 years

XXVIII. Renal cell or kidney cancer
CT should be performed for evaluation of renal cell cancer, MRI of the Abdomen (CPT® 74183) may be obtained for one of the following:
A. Initial staging for:
   1. Extension of tumor of vena cava by other imaging
   2. Inconclusive findings on CT
B. Active surveillance for stage I disease – once within 6 months of surveillance initiation
C. Follow up post ablation for stages I and II – once within 3-6 months post ablation
D. Surveillance of surgically treated kidney cancer – all stages – for one of the following:
   1. New or worsening abdominal symptoms
   2. New or worsening US findings
   3. Suspicious abnormality on post-operative CT

XXIX. Bladder cancer
CT should be performed for the evaluation of bladder cancer. MRI of the Abdomen (CPT® 74183) may be performed for one of the following:
A. Initial staging if muscle invasion on biopsy
B. Surveillance of urethral and urothelial carcinoma of the prostate every 3 months for 2 years, then annually

XXX. Evaluation of elevated liver function tests and non-diagnostic ultrasound
A. Laboratory findings [One of the following]
   1. Direct bilirubin >0.2
   2. Total bilirubin >1.9
   3. Alkaline phosphatase >147IU/L
   4. Gamma GT or GGT >51 IU/L
   5. AST >40 IU/L
   6. ALT >56 IU/L
XXXI. Appendicitis (In children and pregnant women, ultrasound as the initial study except for follow up of known appendicitis with suspected complications. If this is not possible then CT of the abdomen and pelvis is the appropriate study [CPT code 74176, 74177, or 74178]. MRI abdomen [74181, 74182, or 74183] in pregnant women)

XXXII. Planning for stereotactic or gamma knife surgery

XXXIII. Indeterminate liver mass on ultrasound or CT

XXXIV. Arteriovenous fistula with “high output” heart failure.

   A. CT Chest with contrast (CPT® 71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT® 74160 or CPT® 72193 or CPT® 74177) OR
   B. CTA Chest (CPT® 71275) and/or CTA Abdomen and/or CTA Pelvis (CPT® 74175 or CPT® 72191 or CPT® 74174) OR
   C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT® 71552 and/or CPT® 74183 and/or CPT® 72197) OR
   D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT® 71555 and/or CPT® 74185 and/or CPT® 72198)

XXXV. Generalized abdominal pain in men and also women not of childbearing age (CT of the abdomen and pelvis with contrast) [One of the following]

   A. If equivocal ultrasound or
   B. Pain is accompanied with any one of the following:
      1. Failure of conservative treatment for 4 weeks
      2. Cancer history
      3. Fever (101 degrees or greater)
      4. Mass
      5. GI bleeding
      6. Moderate to severe abdominal tenderness
      7. Guarding, rebound tenderness, or other peritoneal signs
      8. WBC 10,000 or greater

XXXVI. Gaucher's Disease (MRI abdomen without contrast [CPT® 74181] and MRI lower extremity without contrast [CPT® 73718] as follows:

   A. Patients not on enzyme therapy -every 12 to 24 months
   B. Patients on enzyme therapy every 12 months:
      1. For change in dose of medication
      2. Complication from medication specific for treatment of Gaucher's disease or clinical complication
      3. Individuals with active bone disease may require more frequent monitoring than once a year
XXXVII. Lumbar and Lumbosacral Plexus

A. MRI Pelvis without and with contrast with fat suppression imaging (CPT® 72197) OR MRI Abdomen and Pelvis without and with contrast with fat suppression imaging (CPT® 74183 and CPT® 72197) OR if MRI is not available, CT Pelvis with contrast (CPT® 72193) OR CT Abdomen and Pelvis with contrast (CPT® 74177) can be considered after EMG/NCV based on whether the upper lumbar plexus (abdominal retroperitoneal space) or the lumbosacral plexus (pelvis), respectively, is involved based on:
1. Malignant infiltration (EMG not required)
2. Radiation plexopathy to r/o malignant infiltration
3. Traumatic injury

XXXVIII. Evaluation of suspected hepatic iron overload

A. Elevated serum ferritin and
   1. If serum transferrin saturation > 45%, and
      a. Hemochromatosis genetic testing results other than homozygous C282Y/H63Asp compound heterozygosity for C282Y/H63Asp (i.e., negative or inconclusive genetic testing for hemochromatosis)
   2. If serum transferrin saturation < 45% and
      a. No history of metabolic syndrome or NAFLD

B. For the evaluation of suspected hepatic iron overload in chronic transfusional states (e.g., sickle cell disease, thalassemia, oncology patients, bone marrow failure, and stem cell transplant patients)

XXXIX. Incidental Splenic Findings

A. Incidental splenic findings on US: CT abdomen (CPT® 74170) or MRI abdomen (CPT® 74183) can be obtained

B. Incidental splenic findings on CT or MRI:
   1. Imaging is diagnostic of a benign lesion (simple cyst, hemangioma) or characteristics are benign-appearing (homogenous, low attenuation, no enhancement, smooth margins): No follow-up imaging.
   2. Imaging characteristics are not diagnostic:
      a. If prior imaging is available and there is one year of stability, no follow up imaging. If not stable, consider MRI if not done, biopsy, or PET.
      b. If no prior imaging and no known malignancy, but suspicious imaging features suggest possible malignancy:
         i. MRI if not already done or biopsy.
         ii. If MRI still inconclusive and biopsy is not feasible then PET can be considered
         iii. Indeterminate imaging features: (equivocal but not suspicious for malignancy): Follow up MRI in 6 and 12 months.
      c. If no prior imaging and there is a known malignancy:
         i. < 1 cm: follow up MRI in 6 and 12 months
         ii. > 1 cm: consider MRI if not done, biopsy. If MRI still inconclusive and biopsy is not feasible then PET can be considered.
XL. Liver Lesion
A. Focal Nodular Hyperplasia (FNH)\(^{117}\)
   1. MRI (CPT® 74183) or Multiphase CT (CPT® 74160 or CPT® 74170) to confirm a diagnosis of FNH.
   2. Follow-up with MRI or CT (CPT® 74160 or CPT® 74170) or MRI (CPT® 74183) can be done if the lesion is not adequately visualized on US.
B. US of the abdomen (CPT® 76700) is the initial study of choice in children\(^{118-122}\)

XLI. Amenorrhea in Children by the age of 16\(^{123-126}\)
A. MRI Pelvis without contrast or without and with contrast (CPT® 72195) or CPT® 72197) +/- Abdomen (CPT® 74181 or CPT® 74183) without and with contrast are indicated for the following:
   1. Evaluation of congenital anomalies of the uterus and/or urinary system identified on abdominal and pelvic ultrasound in order to better define complex anatomy.
   2. Preoperative planning in girls with distention of the vagina by fluid (hydrocolpos) or blood (hematocolpos) due to congenital vaginal obstruction.

XLII. Congenital Mesoblastic Nephroma Surveillance\(^{127-142}\)
A. CT Abdomen and Pelvis with contrast (CPT® 74177) or MRI Abdomen and Pelvis without and with contrast (CPT® 74183 and CPT® 72197) can be approved every 3 months for 1 year after completion of all therapy for patients with residual abnormalities present on post-operative imaging or inconclusive findings on ultrasound

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https://www.ncbi.nlm.nih.gov/pubmed/28124468#
74185  MRA of the Abdomen without or with Gadolinium

I. Renovascular hypertension, suspected renal artery stenosis\textsuperscript{1-7}  
[One of the following]  
A. Severe hypertension (>90 diastolic) with [One of the following]  
   1. Progressive renal insufficiency or  
   2. Refractoriness to aggressive medical therapy  
B. Malignant or accelerated hypertension  
C. Acute worsening of previously stable hypertension  
D. Significant hypertension (>90 diastolic) in adult <35 years old  
E. New onset significant hypertension (>90 diastolic) after age 50  
F. Hypertension in a patient with:  
   1. Diffuse atherosclerosis or  
   2. Incidentally detected asymmetry of kidney size  
G. Hypertension with an acute elevation in plasma creatinine concentration  
   unexplained or after therapy with an ACE inhibitor  
H. Abdominal bruit  
I. Recurring acute pulmonary edema with significant hypertension  
J. Hypokalemia (<3.5 mmol/L) with normal or elevated plasma renin (>1 ng/ml/Hr) levels in the absence of diuretic therapy  
K. Children with hypertension [MRA is preferred]  
L. Hypertension and documented neurofibromatosis

II. Intestinal angina or chronic mesenteric ischemia\textsuperscript{1,2,8-12}  
A. Recurrent acute episodes of abdominal pain [All of the following]  
   1. Postprandial epigastric pain, occasionally radiates to the back  
   2. Weight loss  
   3. Pain after eating

III. Acute mesenteric ischemia\textsuperscript{11,12}  
[One of the following]  
A. Acute mesenteric ischemia is being considered (life-threatening condition)  
B. Isolated right-sided colon involvement suggesting superior mesenteric artery occlusion

IV. Evaluation of renal or liver transplant donor\textsuperscript{1,13-14}

V. Abdominal Aortic Aneurysm (AAA)\textsuperscript{40-42}  
A. For non-obese patients, ultrasound (CPT\textsuperscript{\textregistered}76775) is the preferred initial imaging study to screen or surveil for AAA or to evaluate a pulsatile abdominal mass  
B. For obese patients, CT abdomen with contrast (CPT\textsuperscript{\textregistered}74160) can be substituted for US using the same timeline as non-obese patient  
C. One-time screening recommendations for AAA (Ultrasound (CPT\textsuperscript{\textregistered}76775)):  
   1. Men age 65 to 75 who have smoked  
   2. Women and non-smokers – no routine screening
3. **Medicare** covers a one-time AAA screening ultrasound (procedure code G0389) if there is at least one of the following risk factors:
   a. Family history of AAA
   b. Patient is a male age 65 to 75 who has smoked at least 100 cigarettes in his lifetime

D. Surveillance recommendations for AAA (Ultrasound (CPT® 76775)):
   1. 2.6-2.9 cm → once at 5 years
   2. 3.0-3.4 cm → once at 3 years
   3. 3.5-4.4 cm → annually
   4. 4.5-5.4 cm → every 6 months

E. >5.4 cm or aortic diameter has increased in size by 0.7 cm in six months or at least 1 cm in a year may undergo more frequent monitoring and should be evaluated by a Vascular Specialist

F. Preoperative imaging if endovascular or open repair of AAA is being considered (CPT® 74177, 74178, 74175 or 72191)

G. New onset of back and/or abdominal pain in a patient with a known AAA (CPT® 74177, 74178, 74175 or 72191)

H. Post Open Aortic Repair:
   1. Every 3 years to screen for aneurysms in the remaining aorta

I. Post Endovascular (Stent) Aortic Repair:
   1. 1 month
   2. 3 months if there was evidence of endoleak on the 1 month study
   3. 6 months
   4. 12 months
   5. Every year

VI. **Peripheral arterial vascular disease with abnormal ankle brachial index as defined in A and one additional of the following**¹,²,24-27

A. Note: For evaluation of PVD, if meets criteria for MRA abdomen, MRA lower extremity (one only) should be certified. An MRA of the pelvis or another lower extremity should NOT be certified. ABI (ankle brachial index, ankle systolic BP divided by brachial systolic BP)
   1. Rest ABI <0.90 in symptomatic member
   2. Exercise ABI <0.90 in symptomatic member with rest ABI >0.90
   3. Toe brachial index <0.90 or pulse volume recording evidence of peripheral vascular disease if the ABI >1.30

B. Abnormal pulses
C. Bruit
D. Claudication
E. Diabetic with: [One of the following]
   1. Skin changes
   2. Loss of hair
   3. Poor capillary refill
   4. Thickened nails
   5. Thin skin
F. Arteritis (Takayasu’s arteritis, giant cell arteritis) [One of the following]
   1. ESR >22 mm/hr
2. Positive ANA
3. Positive RF or rheumatoid factor

G. Scleroderma

H. Hypercoagulable state [One of the following]
   1. Antiphospholipid antibodies
   2. Behçet’s syndrome
   3. Protein C deficiency
   4. Protein S deficiency
   5. Factor V Leiden deficiency
   6. Lupus anticoagulant
   7. Hyperactive platelet syndrome
   8. MRHFR
   9. Anticardiolipin antibodies
   10. Elevated homocysteine level
   11. Anti B2 glycoprotein antibodies
   12. Elevated fibrinogen
   13. PTT abnormal
   14. Antithrombin III antibodies
   15. Oral contraceptive use
   16. Hormone replacement
   17. Sickle cell anemia

I. Buerger’s disease (thromboangiitis obliterans) [Both of the following]
   1. History of smoking
   2. Loss of pulses or decreased pulses in the lower extremity

J. Known atherosclerotic occlusive disease when catheter angiography fails to demonstrate an occult runoff vessel suitable for vascular bypass

VII. Evaluation of the hepatic arteries and veins (including portal vein)\(^1,13,33-35\) [One of the following]

A. Evaluation of portal and hepatic veins prior to or following TIPS (transjugular intrahepatic portosystemic shunt)
B. Evaluation of portal and hepatic veins prior to or following surgical intervention for portal hypertension
C. Evaluation of hepatic vasculature prior to and following embolization procedure
D. Evaluation of hepatic vasculature prior to planned hepatectomy
E. Evaluation of liver donor
F. Suspected hepatic vein thrombosis or Budd-Chiari syndrome [One of the following]
   1. Ascites
   2. Hepatomegaly
   3. Inadequate Doppler ultrasound of hepatic veins
G. Possible portal vein thrombosis with negative or inadequate Doppler study of the portal vein [One of the following]
   1. Hypercoagulable state
   2. Abdominal malignancy
H. Preoperative evaluation for pancreatic cancer
VIII. Evaluation of abdominal veins other than hepatic and portal veins\textsuperscript{1,25-27}
   A. Nephrotic syndrome
   B. Suspicion of iliac vein thrombus
   C. Suspicion of inferior vena cava thrombus
   D. Renal vein thrombosis (See X)
   E. Mesenteric vein thrombosis

IX. Thoracic Aorta\textsuperscript{126-136}

   NOTE: thoracic aortic diseases are variable and critical; selected imaging procedures are dependent upon the physicians' preference and expertise. As a result, all thoracic imaging in this section can be one of the following studies listed in the table below:

<table>
<thead>
<tr>
<th>Table of Thoracic Aorta Imaging Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT of chest, and/or abdomen, and/or pelvis (contrast as requested);</td>
</tr>
<tr>
<td>MRI of the chest, and/or abdomen, and/or pelvis without contrast OR without and with contrast</td>
</tr>
<tr>
<td>CTA of chest, and/or abdomen, and/or pelvis (CPT\textsuperscript{®} 71275, CPT\textsuperscript{®} 74175, CPT\textsuperscript{®} 72191);</td>
</tr>
<tr>
<td>MRA of chest, and/or abdomen, and/or pelvis (CPT\textsuperscript{®} 71555, CPT\textsuperscript{®} 74185, CPT\textsuperscript{®} 72198)</td>
</tr>
</tbody>
</table>

A. Aortic Dissection
   1. For suspected aortic dissection, conduct CTA or MRA of the entire aorta (including arch branches) and extending through the femoral arteries
   2. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” can be performed
      a. “Medically” treated
         i. Every 6 months if total aortic diameter is $\geq 4.5$ cm
         ii. Annually if total aortic diameter is $<4.5$ cm
      b. Surgery or Stent for any type of dissection
         i. First Year: 1 month, 3 months, 6 months, 12 months, then annually

B. Thoracic Aortic Aneurysm
   1. For suspected TAA, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
      a. Abnormalities identified on Chest x-ray (abnormality including widened mediastinal) or other imaging studies (fluoroscopy, spine MRI, etc) abnormality.
   2. For known TAA and chest pain or back pain, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above:
   3. For follow-up, any requested imaging from the “Table of Thoracic Aorta Imaging Options” above for the following:
      a. “Medically” treated/observation
         i. 3.5 to 4.4 cm TAA can be followed annually
         ii. $\geq 4.5$ TAA can be followed every 6 months
         iii. $\geq 3.0$ cm TAA when there is concern for growth can have a one time 3 month interval advanced imaging
      b. Surgery or Stent
i. Preoperative open or endovascular (stent) repair imaging is appropriate
ii. Suspicion of endoleak
iii. Open repair imaging every 3-5 years
c. Endovascular graft/stent
   i. First year: 1 month, 3 months, 6 months, 12 months, then annually

4. Screening with abdominal aortic Aneurysm (AAA)
a. Known TAA can be screened for AAA using Abdominal Imaging Guidelines (usually US)
b. Known AAA screening for TAA is not supported by sufficient evidence

C. Screening Guidelines for Familial Syndromes

1. Screening for Familial Syndromes and Genetic Syndromes
   a. **Suspected** Familial Thoracic Aortic Aneurysm
      i. ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) and CXR for all
         First-degree relatives (parents, siblings, children) of patients with
         TAA and/or dissection
      b. Any imaging listed can be performed if these studies identify a TAA or
         are equivocal or do not visualize the ascending aorta adequately
   c. **Follow-Up** per TAA Follow-Up guidelines

2. Screening for Marfan Syndrome or Ehlers-Danlos Syndrome, Vascular form or Type IV
   a. **Suspected**, ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) at the
      time of diagnosis.
   b. Follow-up
      i. Annual ECHO (CPT® 93306, CPT® 93307, or CPT® 93308) or per
         TAA Follow-Up guidelines

D. Thoracic aorta in Individuals with Bicuspid Aortic Valve

1. Screening for Bicuspid Aortic Valve
   a. **Suspected**, any requested imaging from the “Table of Thoracic Aorta
      Imaging Options” and/or ECHO (CPT® 93306, CPT® 93307, or CPT®
      93308)
      i. Additional imaging such as cardiac MRI, cardiac CT, or CCTA is
         NOT generally indicated.
      ii. There is no evidence-based data to support screening relatives of
         patients with bicuspid aortic valve.
   b. **Follow-up** per TAA Follow-Up guidelines
      i. If no dilation of the aortic root or ascending thoracic aorta is found,
         there is no evidence-based data to support continued surveillance
         imaging

X. **Suspected renal vein thrombosis**¹ [One of the following]
   A. Nephrotic syndrome
   B. Proteinuria – 3 grams or more in 24 hours
   C. Lupus nephritis
   D. Hypercoagulable state [One of the following]
      1. Antiphospholipid antibodies
      2. Behçet’s syndrome
3. Protein C deficiency
4. Protein S deficiency
5. Factor V Leiden deficiency
6. Lupus anticoagulant
7. Hyperactive platelet syndrome
8. MRHFR
9. Anticardiolipin antibodies
10. Elevated homocysteine level
11. Anti B2 glycoprotein antibodies
12. Elevated fibrinogen
13. PTT abnormal
14. Antithrombin III antibodies
15. Oral contraceptive use
16. Hormone replacement
17. Sickle cell anemia

XI. Vasculitis and collagen vascular disease¹
   A. History of collagen vascular disease
   B. Blue toe syndrome
   C. Claudication
   D. Non healing vascular ulcers of the lower extremity
   E. History of suspicion of polyarteritis nodosa
   F. Known or suspected Takayasu’s arteritis
   G. Henoch-Schönlein purpura

XII. Vasculitis and collagen vascular disease¹,³⁶

XIII. Preoperative planning of breast reconstruction using a tissue flap³⁷ (CTA of the abdomen and pelvis)

XIV. Arteriovenous fistula with “high output” heart failure:³⁸-³⁹
   A. CT Chest with contrast (CPT®71260) and/or CT Abdomen and/or CT Pelvis with contrast (CPT®74160 or CPT®72193 or CPT®74177) OR
   B. CTA Chest (CPT®71275) and/or CTA Abdomen and/or CTA Pelvis (CPT®74175 or CPT®72191 or CPT®74174) OR
   C. MRI Chest and/or MRI Abdomen and/or MRI Pelvis without and with contrast (CPT®71552 and/or CPT®74183 and/or CPT®72197) OR
   D. MRA Chest and/or MRI Abdomen and/or MRI Pelvis (CPT®71555 and/or CPT®4185 and/or CPT®72198)

References:

74261 Virtual Colonoscopy Diagnostic without Contrast
74262 Virtual Colonoscopy Diagnostic with Contrast

I. Evaluation of patients who have had an incomplete fiber optic colonoscopy or if an optical colonoscopy is contraindicated [One of the following]1-5

A. Failed colonoscopy [One of the following]
   1. If the virtual colonoscopy is to be performed immediately following the failed colonoscopy, then a copy of the colonoscopy note must be provided
   2. If the virtual colonoscopy is to be performed at another time, a copy of the failed colonoscopy report must be provided

B. Fiber optic colonoscopy contraindicated [One of the following]
   1. Recent myocardial infarction within the last 60 days7-9
   2. Bleeding disorder
   3. Intolerance or allergy to sedation
   4. Severe lung disease
   5. Anticoagulation therapy that cannot be stopped

The following conditions are considered to be contraindications to virtual colonoscopy:
   1. Active Crohn’s disease
   2. Active ulcerative colitis
   3. Active diverticulitis
   4. Active inflammatory bowel disease
   5. Total hip replacement (Metal may result in significant CT scan artifacts)
   6. Recent surgery
   7. Pregnancy
   8. Severe pain or cramps on the day of the examination

References:

1. Veerappan GR, Cash BD. Should Computed Tomographic Colonography Replace Optical Colonoscopy Screening For Colorectal Cancer? Pol Arch Med Wewn 209 Apr; 119 (4):236-41 Review Article Gastroenterology Service Walter Reed Army Medical Center, Washington, DC, USA.


I. **Asymptomatic individual 50 years of age or older**
   A. Not more frequently than every 5 years [One of the following]
      1. Initial examination
      2. Prior colonoscopy or virtual colonoscopy was normal or documented polyp(s) less than 6mm in size

II. **Surveillance [One of the following]**
   A. Individual with polyp(s) 6mm or larger in size who refuse optical colonoscopy
   B. Individual with polyp(s) 6 mm or larger in whom colonoscopy is contraindicated
      1. Bleeding disorder
      2. Severe lung disease
      3. Intolerance or allergy to sedation
      4. Anticoagulation therapy that cannot be stopped
      5. Recent myocardial infarction

III. **Limitations for screening studies**
   A. Not medically necessary if there has been a normal optical colonoscopy performed less than 10 years ago
   B. Not medically necessary if there has been a normal double contrast barium enema less than 5 years ago
   C. Not medically necessary if there has been a normal sigmoidoscopy within the last 5 years

The following conditions are considered to be contraindications to virtual colonoscopy:
8. Active Crohn’s disease
9. Active ulcerative colitis
10. Active diverticulitis
11. Active inflammatory bowel disease
12. Total hip replacement (Metal may result in significant CT scan artifacts)
13. Recent surgery
14. Pregnancy
   1. Severe pain or cramps on the day of the examination

IV. **Evaluation of patients who have had an incomplete fiber optic colonoscopy or if an optical colonoscopy is contraindicated**
[One of the following]
A. Failed colonoscopy [One of the following]
   1. If the virtual colonoscopy is to be performed immediately following the failed colonoscopy, then a copy of the colonoscopy note must be provided
   2. If the virtual colonoscopy is to be performed at another time, a copy of the failed colonoscopy report must be provided

B. Fiber optic colonoscopy contraindicated [One of the following]
   1. Recent myocardial infarction
   2. Bleeding disorder
   3. Intolerance or allergy to sedation
   4. Severe lung disease
   5. Anticoagulation therapy that cannot be stopped

References:

5. Veerappan GR, Cash BD. Should Computed Tomographic Colonography Replace Optical Colonoscopy Screening For Colorectal Cancer? Pol Arch Med Wewn 2009 Apr; 119 (4):236-41 Review Article Gastroenterology Service Walter Reed Army Medical Center, Washington, DC, USA.
Screening CTC (CPT® 74263) for colorectal cancer can be performed as follows, unless one of the following has been completed: FIT-DNA (multi-targeted stool DNA test) within the last 3 years OR Colonoscopy within the last 10 years.\textsuperscript{1,2,3}

A. This coverage may vary according to health plan/payer policies.
   1. Every 5 years in average-risk non-African American individuals ages 50 to 75. (Average risk is defined as no previously diagnosed colorectal cancer, colonic adenomas, or inflammatory bowel disease involving the colon.
   2. Screening CTC can be performed in individuals between 76 to 85 if there is no history of a previously negative colonoscopy or CTC.
   3. Screening CTC can be performed in African-Americans beginning at age 45.
   4. Individuals with a SINGLE first-degree relative diagnosed at age > 60 years with colorectal cancer or an advanced adenoma can be screened with CTC beginning at age 40. (If there are 2 or more first degree relatives at any age with CRC or an advanced adenoma, or a first degree relative < 60, the patient should be screened via colonoscopy, not CTC).

References:

### I. Fetal MRI (CPT® 74712; CPT® 74713 for each additional gestation)

A. Do not report CPT® 74712 and CPT® 74713 in conjunction with CPT® 72195, CPT® 72196, CPT® 72197

B. If only placenta or maternal pelvis is imaged without fetal imaging, use MRI pelvis (CPT® 72195)

### II. Indications for fetal MRI

<table>
<thead>
<tr>
<th>Fetal organs</th>
<th>Indication main category</th>
<th>Indication sub category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain</td>
<td>Congenital anomalies</td>
<td>Ventriculomegaly; corpus callosal dysgenesis; holoprosencephaly; posterior fossa anomalies; malformations of cerebral cortical development</td>
</tr>
<tr>
<td></td>
<td>Screening fetuses with a family risk for brain anomalies</td>
<td>E.g. tuberous sclerosis; corpus callosal dysgenesis; malformations of cerebral cortical development</td>
</tr>
<tr>
<td>Spine</td>
<td>Congenital anomalies</td>
<td>Neural tube defects; sacrococcygeal teratomas; caudal regression/sacral agenesis; sirenomelia; vertebral anomalies</td>
</tr>
<tr>
<td>Skull, face and neck</td>
<td>Masses of the face and neck</td>
<td>Venolymphatic malformations; hemangiomas; goiter; teratomas; facial clefts</td>
</tr>
<tr>
<td></td>
<td>Airway obstruction</td>
<td>Conditions that may impact parental counseling, prenatal management, delivery planning, and postnatal therapy</td>
</tr>
<tr>
<td>Thorax</td>
<td>Masses</td>
<td>Congenital pulmonary airway malformations (congenital cystic adenomatoid malformation; sequestration, and congenital lobar emphysema); congenital diaphragmatic hernia; effusion</td>
</tr>
<tr>
<td>Abdomen, retroperitoneal and pelvis</td>
<td>Volumetric assessment of lung</td>
<td>Cases at risk for pulmonary hypoplasia secondary to oligohydramnios, chest mass, or skeletal dysplasias</td>
</tr>
<tr>
<td>Complications of monochorionic twins</td>
<td>Mass</td>
<td>Delineation of vascular anatomy prior to laser treatment of twins; assessment of morbidity after death of a monochorionic co-twin, and improved delineation of anatomy in conjoined twins</td>
</tr>
<tr>
<td>Fetal surgery assessment</td>
<td></td>
<td>Meningomyelocele; sacrococcygeal teratomas; processes obstructing the airway (e.g. neck mass or congenital high airway obstruction); complications of monochorionic twins needing surgery; and chest masses.</td>
</tr>
</tbody>
</table>
References


74712, 74713 Fetal MRI
I. Cardiac MRI – Coding

<table>
<thead>
<tr>
<th>Cardiac Imaging Procedure Codes</th>
<th>CPT®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac magnetic resonance imaging for morphology and function without contrast</td>
<td>75557</td>
</tr>
<tr>
<td>Cardiac magnetic resonance imaging for morphology and function without contrast; with stress imaging</td>
<td>75559</td>
</tr>
<tr>
<td>Cardiac magnetic resonance imaging for morphology and function without and with contrast and further sequences</td>
<td>75561</td>
</tr>
<tr>
<td>Cardiac magnetic resonance imaging for morphology and function without and with contrast and further sequences; with stress imaging</td>
<td>75563</td>
</tr>
<tr>
<td>Cardiac magnetic resonance imaging for velocity flow mapping (List separately in addition to code for primary procedure)</td>
<td>+75565</td>
</tr>
</tbody>
</table>

A. Only one procedure code from the set (CPT® 75557- CPT® 75563) should be reported per session.
B. Only one flow velocity measurement (CPT® +75565) should be reported per session when indicated.
C. Requests for cardiac MRI that contain more than one cardiac/chest MRI CPT® Code must be forwarded for Medical Director review.

II. Cardiac MRI – Indications (excluding Stress MRI)

A. Assess myocardial viability (to differentiate hibernating myocardium from scar) when necessary to determine if revascularization should be performed (CPT® 75561)

Assessment of global ventricular function and mass if a specific clinical question is left unanswered by a recent echocardiogram and results will affect patient management (CPT® 75557 or CPT® 75561). Particularly useful in evaluating:

1. Cardiomyopathy (ischemic, diabetic, hypertrophic, or muscular dystrophy)
2. Noncompaction
3. Amyloid heart disease
4. Post cardiac transplant
5. Hemochromatosis
6. Post transfusion hemosiderosis
7. Hypertrophic heart disease
8. Myocarditis, cardiac aneurysm, trauma and contusions
9. Monitoring cancer chemotherapy effect on the heart (especially if accurate assessment of right ventricular function is documented as necessary).

B. Pre and postoperative congenital heart disease assessment (e.g. Tetralogy of Fallot, patent ductus arteriosus, platypnea, atrial septal defects, restrictive VSD, anomalous pulmonary arteries or veins or anomalous coronary arteries) (CPT® 75557 or CPT® 75561)
   1. Chest MRA (CPT® 71555) may be added if the aorta or pulmonary artery need to be visualized beyond the root.
   2. Report CPT® +75565 in conjunction with CPT® 75557 or CPT® 75561, only if there is a need to clarify findings on a recent echocardiogram and cardiac Doppler study

C. Chest MRA alone (CPT® 71555) can be performed in certain situations (e.g. suspected dissection, coarctation, known or suspected aortic aneurysm)

D. Coarctation of the aorta
   1. Follow-up (surveillance) imaging after repair of coarctation:
      a. Adults: chest MRA (CPT® 71555) every 2 to 3 years and before and after any intervention for re-coarctation
      b. Infants and children: ECHO every month for several months, then ECHO every 6 months to one year thereafter

E. Arrhythmogenic right ventricular dysplasia or arrhythmogenic cardiomyopathy (ARVD/ARVC) suspicion (including presyncope or syncope, established criteria for ARVD (CPT® 75557 or CPT® 75561)

F. Differentiate constrictive pericarditis from restrictive cardiomyopathy (CPT® 75561).

G. Evaluate cardiac tumor or mass when echocardiogram is inconclusive

H. Initial evaluation for cardiac sarcoidosis

I. Anomalous coronary arteries: Cardiac MRI (CPT® 75561) or CCTA (CPT® 75574) is much better at detecting this than conventional angiography.

J. Assess coronary arteries in Kawasaki’s disease

K. Fabry disease
   1. Late enhancement MRI may predict the effect of enzyme replacement therapy on myocardial changes that occur with this disease (CPT® 75561)

L. Evaluate valvular heart disease when echocardiogram is inconclusive.
   Appropriate procedures include:
   1. CPT® 75557 or CPT® 75561 and CPT® 75565
   2. CPT® 75565

M. Pulmonary vein anatomy for planned ablation procedures in patients with atrial fibrillation. Report cardiac MRI (CPT® 75557 or CPT® 75561) or chest MRV (CPT® 71555), but not both (see Pulmonary Artery and Vein Imaging for guidelines on follow-up imaging after ablation procedure).

N. Suspected cardiac thrombus when echocardiogram is inconclusive (CPT® 75557)

O. Right ventricular function evaluation (CPT® 75557 in conjunction with CPT® +75565) if a recent ECHO has been done, and there is documented need to perform cardiac MRI in order to resolve an unanswered question
P. Shunting through a VSD (CPT® 75557 in conjunction with CPT® +75565) if a recent ECHO has been done, including a bubble study, and there is documented need to perform cardiac MRI in order to resolve an unanswered question

Q. Evaluate for iron overload due to conditions requiring frequent blood transfusions (i.e. sickle cell, thalassemia, hemochromatosis, etc.) (CPT® 75557)

III. Cardiac MRI - Aortic Root and Proximal Ascending Aorta
A. See Thoracic Aorta in the Chest Imaging Guidelines

IV. Cardiac MRI - Evaluation of Pericardial Effusion or Diagnosis of Pericardial Tamponade
A. Contrast enhanced cardiac MRI (CPT® 75561) is useful for evaluating pericarditis, neoplastic and other effusion, tamponade or myocardial infiltration if a specific clinical question is left unanswered by echocardiogram or another recent imaging study
1. Cardiac MRI – Indications for Stress MRI
B. If a nuclear perfusion (MPI) stress test was performed and was equivocal, a stress MRI is appropriate.
C. For indications for Stress MRI, see Stress Testing with Imaging – Indications
75559  Cardiac MRI for Morphology and Function without Contrast; with Stress Imaging
75563  Cardiac MRI for Morphology and Function without Contrast Followed by Contrast Material and Further Sequences; with Stress Imaging
78451  Myocardial Perfusion Imaging with SPECT – Single Study
78452  Myocardial Perfusion Imaging with SPECT – Multiple Studies
78453  Myocardial Perfusion Imaging, Planar Rest or Stress
78454  Myocardial Perfusion Imaging, Planar Rest and/or Stress
93350  Echocardiography, Transthoracic, Real-Time with Image Documentation (2D), Includes M-Mode Recording, When Performed, During Rest and Cardiovascular Stress Test Using Treadmill, Bicycle Exercise and/or Pharmacologically Induced Stress, with Interpretation and Report with or without M-Mode Recording, During Rest and Cardiovascular Stress Test, with Interpretation and Report
93351  Echocardiography, Transthoracic, Real-Time with Image Documentation (2D), Includes M-Mode Recording, When Performed, During Rest and Cardiovascular Stress Test Using Treadmill, Bicycle Exercise and/or Pharmacologically Induced Stress, with Interpretation and Report with or without M-Mode Recording, During Rest and Cardiovascular Stress Test, with Interpretation and Report; Including Performance of Continuous Electrocardiographic Monitoring, with Supervision by a Qualified Healthcare Professional
I. General Issues – Cardiac
   A. Cardiac imaging is not indicated if the results will not affect patient management decisions. If a decision to perform cardiac catheterization or other angiography has already been made, there is often no need for imaging stress testing.
   B. A current clinical evaluation (within 60 days) is required prior to considering advanced imaging, which includes:
      1. Relevant history and physical examination and appropriate laboratory studies and non-advanced imaging modalities, such as recent ECG (within 60 days), chest x-ray or ECHO/ultrasound, after symptoms started or worsened.
         a. Effort should be made to obtain copies of reported “abnormal” ECG studies in order to determine whether the ECG is uninterpretable.
         b. Most recent previous stress testing and its findings
         c. Other meaningful contact (telephone call, electronic mail or messaging) by an established patient can substitute for a face-to-face clinical evaluation.
      2. Vital signs, height and weight or BMI or description of general habitus is needed.
      3. Advanced imaging should answer a clinical question which will affect management of the patient’s clinical condition.
      4. Assessment of coronary artery disease can be determined by the following:
         a. Typical angina (definite):
         b. Substernal chest discomfort (generally described as pressure, heaviness, burning, or tightness)
         c. Generally brought on by exertion or emotional stress and relieved by rest
         d. May radiate to the left arm or jaw
         e. When clinical information is received indicating that a patient is experiencing chest pain that is "exertional" or "due to emotional stress", this meets the typical angina definition under the Pre-Test Probability Grid. No further description of the chest pain is required (location within the chest is not required).
      5. The Pre-Test Probability Grid (Table 1) is based on age, gender, and symptoms. All factors must be considered in order to approve for stress testing with imaging using the Pre-Test Probability Grid.
         a. Atypical angina (probable): Chest pain or discomfort (arm or jaw pain) that lacks one of the characteristics of definite or typical angina.
         b. Non-anginal chest pain: Chest pain or discomfort that meets one or none of the typical angina characteristics.
         c. Anginal variants or equivalents: a manifestation of myocardial ischemia which is perceived by patients to be (otherwise unexplained) dyspnea, unusual fatigue, more often seen in women and may be unassociated with chest pain.
II. Stress Testing without Imaging – Procedures

The Exercise Treadmill Test (ETT) is without imaging

A. Necessary components of an ETT include:
   1. ECG that can be interpreted for ischemia.
   2. Patient capable of exercise on a treadmill or similar device (generally at 4 METs or greater; see functional capacity below).

B. An abnormal ETT (exercise treadmill test) includes any one of the following:
   1. ST segment depression (usually described as horizontal or downsloping, greater or equal to 1.0 mm below baseline)
   2. Development of chest pain
   3. Significant arrhythmia (especially ventricular arrhythmia)
   4. Hypotension

C. Functional capacity greater than or equal to 4 METs equates to the following:
   1. Can walk four blocks without stopping
   2. Can walk up a hill
   3. Can climb one flights of stairs without stopping
   4. Can perform heavy work around the house

Practice Note: An observational study found that, compared with the Duke Activity Status Index, subjective assessment by clinicians generally underestimated exercise capacity (see reference 25).

III. Stress Testing with Imaging – Procedures

A. Imaging Stress Tests include any one of the following:
   1. Stress Echocardiography (see Stress Echocardiography (Stress Echo) – Coding)
   2. MPI (see Myocardial Perfusion Imaging (MPI) – Coding)
   3. Stress perfusion MRI (see Cardiac MRI – Indications for Stress MRI)
   4. Stress testing with imaging can be performed with maximal exercise or chemical stress (dipyridamole, dobutamine, adenosine, or regadenoson) and does not alter the CPT® codes used to report these studies.

IV. Stress Testing with Imaging – Indications

Stress echo, MPI OR stress MRI, can be considered for the following:

A. New, recurrent or worsening cardiac symptoms AND with any of the following:
   1. High pretest probability (greater than 90% probability of CAD)
   2. A history of CAD based on:
      a. A prior anatomic evaluation of the coronaries OR
      b. A history of CABG or PCI
   3. Evidence or high suspicion of ventricular tachycardia
   4. Age 40 years or greater and known diabetes mellitus
   5. Coronary calcium score ≥ 100
   6. ECG is uninterpretable for ischemia due to any one of the following:
a. Complete Left Bundle Branch Block (bifascicular block involving right bundle branch and left anterior hemiblock does not render ECG uninterpretable for ischemia)
b. Ventricular paced rhythm
c. Pre-excitation pattern such as Wolff-Parkinson-White
d. Greater or equal to 1.0 mm ST segment depression (NOT nonspecific ST/T wave changes. T wave inversion isolated in lead III or T wave inversion in lead V1 and V2 are not included).
e. LVH with repolarization abnormalities, also called LVH with strain (NOT without repolarization abnormalities or by voltage criteria)
f. T-wave inversion in the inferior and/or lateral leads. This includes leads II, AVF, V5, or V6)
g. Patient on digitalis preparation
7. Continuing symptoms in a patient who had a normal or submaximal exercise treadmill test and there is suspicion of a false negative result.
8. Patients with recent equivocal, borderline, or abnormal stress testing where ischemia remains a concern.
9. Heart rate less than 50 bpm in patients on beta blocker and/or calcium channel blocker medication where it is felt that the patient may not achieve an adequate workload for a diagnostic exercise study.
10. Inadequate ETT:
   a. Physical inability to achieve target heart rate (85% MPHR or 220-age.) Target heart rate is calculated as 85% of the maximum age predicted heart rate (MPHR). MPHR is estimated as 220 minus the patient's age.
   b. History of false positive exercise treadmill test: a false positive ETT is one that is abnormal however the abnormality does not appear to be due to macrovascular CAD.
B. Within 3 months of an acute coronary syndrome (e.g. ST segment elevation MI [STEMI], unstable angina, non-ST segment elevation MI [NSTEMI]), one MPI can be performed to evaluate for inducible ischemia if all of the following related to the most recent acute coronary event apply:
   1. Individual is hemodynamically stable
   2. No recurrent chest pain symptoms and no signs of heart failure
   3. No prior coronary angiography or imaging stress test in regards to the current episode of symptoms
C. Assessing myocardial viability in patients with significant ischemic ventricular dysfunction (suspected hibernating myocardium) and persistent symptoms or heart failure such that revascularization would be considered.
   1. NOTE: MRI, cardiac PET, MPI, or Dobutamine stress echo can be used to assess myocardial viability depending on physician preference
   2. PET and MPI perfusion studies are usually accompanied by PET metabolic examinations (CPT® 78459). TI-201 MPI perfusion studies may assess viability without accompanying PET metabolism information.
D. Unheralded syncope (not near syncope)
E. Asymptomatic patient with an uninterpretable ECG that has never been evaluated or is a new uninterpretable change.
F. Patient with an elevated cardiac troponin.
G. One routine study 2 years or more after a stent, except with a left main stent where it can be done at 1 year.
H. One routine study at 5 years or more after CABG, without cardiac symptoms.
I. Every 2 years if there was documentation of previous “silent ischemia” on the imaging portion of a stress test but not on the ECG portion.
J. To assess for CAD prior to starting a taking Class IC antiarrhythmic agent (flecainide or propafenone) and annually while taking the medication.
K. Prior anatomic imaging study (coronary angiogram or CCTA) demonstrating coronary stenosis in a major coronary branch which is of uncertain functional significance can have one stress test with imaging.
L. Evaluating new, recurrent or worsening left ventricular dysfunction/CHF.

V. Stress Testing with Imaging - Preoperative
A. There are 2 steps that determine the need for imaging stress testing in (stable) pre-operative patients:
   1. Would the patient qualify for imaging stress testing independent of planned surgery?
      a. If yes, proceed to stress testing guidelines above
      b. If no, go to step 2
   2. Is the surgery considered high, moderate or low risk? (see Table 2) If high or moderate-risk, proceed below. If low-risk, there is no evidence to determine a need for preoperative cardiac testing.
      a. **High Risk Surgery:** All patients in this category should receive an imaging stress test if there has not been an imaging stress test within 1 year*, unless the patient has developed new cardiac symptoms or a new change in the EKG since the last stress test.
      b. **Intermediate Surgery:** One or more risk factors and unable to perform an ETT per guidelines if there has not been an imaging stress test within 1 year* unless the patient has developed new cardiac symptoms or a new change in the EKG since the last stress test.
         i. **Clinical Risk Factors (for cardiac death & non-fatal MI at time of non-cardiac surgery)**
            a. Planned high risk surgery (open surgery on the aorta or open peripheral vascular surgery)
            b. History of ischemic heart disease (previous MI, previous positive stress test, use of nitroglycerin, typical angina, ECG Q waves, previous PCI or CABG)
            c. History of compensated previous congestive heart failure (history of heart failure, previous pulmonary edema, third heart sound, bilateral rales, chest x-ray showing heart failure)
            d. History of previous TIA or stroke
            e. Diabetes Mellitus
            f. Creatinine level > 2 mg/dL
      c. **Low Risk:** Preoperative imaging stress testing is not supported.

*Time interval is based on consensus of eviCore executive cardiology panel.
### Table 2

<table>
<thead>
<tr>
<th>Cardiac Risk Stratification List</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk (&gt;5%)</strong></td>
</tr>
<tr>
<td>Open aortic and other major open vascular surgery</td>
</tr>
<tr>
<td>Open peripheral vascular surgery</td>
</tr>
<tr>
<td><strong>Intermediate Risk (1-5%)</strong></td>
</tr>
<tr>
<td>Open intraperitoneal and/or intrathoracic surgery</td>
</tr>
<tr>
<td>Open carotid endarterectomy</td>
</tr>
<tr>
<td>Head and neck surgery</td>
</tr>
<tr>
<td>Open orthopedic surgery</td>
</tr>
<tr>
<td>Open prostate surgery</td>
</tr>
<tr>
<td><strong>Low Risk (&lt;1%)</strong></td>
</tr>
<tr>
<td>Endoscopic procedures</td>
</tr>
<tr>
<td>Superficial procedures</td>
</tr>
<tr>
<td>Cataract surgery</td>
</tr>
<tr>
<td>Breast surgery</td>
</tr>
<tr>
<td>Ambulatory surgery</td>
</tr>
<tr>
<td>Laparoscopic and endovascular procedures that are unlikely to require further extensive surgical intervention</td>
</tr>
</tbody>
</table>

### VI. Transplant Patients

A. Stress Testing in patients for **Non-Cardiac** Transplant
   1. Individuals who are candidates for any type of organ bone marrow or stem cell transplant can undergo imaging stress testing every year (usually stress echo or MPI) prior to transplant.
   2. Individuals who have undergone organ transplant are at increased risk for ischemic heart disease secondary to their medication. Risk of vasculopathy is 7% at one year, 32% at five years and 53% at ten years. An imaging stress test can be repeated annually after transplant for at least two years or within one year of a prior cardiac imaging study if there is evidence of progressive vasculopathy.
   3. After two consecutive normal imaging stress tests, repeated testing is not supported more often than every other year without evidence for progressive vasculopathy or new symptoms.
   4. Stress testing after five years may proceed according to normal patterns of consideration.

B. Post-**Cardiac transplant** assessment of transplant CAD: One of the following imaging studies may be performed annually:
   1. MPI
   2. Stress ECHO
   3. Stress MRI
   4. Cardiac PET perfusion with coronary flow quantitation (CPT® 78491 or CPT® 78492)

### VII. Non-imaging Heart Function and Cardiac Shunt Imaging

A. Procedures reported with CPT® 78414 and CPT® 78428 are essentially obsolete and should not be performed in lieu of other preferred modalities.

B. Echocardiogram is the preferred method for cardiac shunt detection, rather than the cardiac shunt imaging study described by CPT® 78428.
C. Ejection fraction can be obtained by echocardiogram, MPI, MUGA study, cardiac MRI, cardiac CT, or cardiac PET depending on the clinical situation, rather than by the non-imaging heart function study described by CPT® 78414.

VIII. Genetic lab testing in the evaluation of CAD
A. Corus® CAD genetic expression score – refer to lab management program guidelines

Rule 1: Determination of pretest probability for coronary disease based on chest pain

<table>
<thead>
<tr>
<th>Pre-Test Probability of CAD by Age, Gender, and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age-Years</strong></td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>30-39</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>40-49</td>
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<tr>
<td></td>
</tr>
<tr>
<td>50-59</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>≥60</td>
</tr>
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<td></td>
</tr>
</tbody>
</table>

High: Greater than 90% pre-test probability
Intermediate: Between 10% and 90% pre-test probability
Low: Between 5% and 10% pre-test probability
Very Low: Less than 5% pre-test probability

Typical angina (definite): 1) Substernal chest pain or discomfort that is 2) provoked by exertion or emotional stress and 3) relieved by rest and/or nitroglycerin.
Atypical angina (probable): Chest pain or discomfort that lacks one of the characteristics of definite or typical angina.
Non-anginal chest pain: Chest pain or discomfort that meets one or none of the typical angina characteristics.

Practice Estimate of Effective Radiation Dose chart for Selected Imaging Studies

<table>
<thead>
<tr>
<th>IMAGING STUDY</th>
<th>Estimate of Effective</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Radiation Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sestamibi myocardial perfusion study (MPI)</td>
</tr>
<tr>
<td>PET myocardial perfusion study:</td>
</tr>
<tr>
<td>Rubidium-82</td>
</tr>
<tr>
<td>NH3</td>
</tr>
<tr>
<td>Thallium myocardial perfusion study (MPI)</td>
</tr>
<tr>
<td>Diagnostic conventional coronary angiogram (cath)</td>
</tr>
<tr>
<td>Computed tomography coronary angiography (CTCA) (with prospective gating)</td>
</tr>
<tr>
<td>Less than 5 mSv</td>
</tr>
<tr>
<td>CT of Abdomen and pelvis</td>
</tr>
<tr>
<td>Chest x-ray</td>
</tr>
</tbody>
</table>

References:


<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>75571</td>
<td>Coronary Artery Calcium Scoring</td>
</tr>
<tr>
<td>75572</td>
<td>CT Heart Structure and Morphology with Contrast</td>
</tr>
<tr>
<td>75573</td>
<td>CT Heart Structure and Morphology in Congenital Heart Disease with Contrast</td>
</tr>
<tr>
<td>75574</td>
<td>CTA Coronary Arteries and Structure and Morphology with Function and with Contrast</td>
</tr>
<tr>
<td>0501T</td>
<td>Noninvasive estimated coronary fractional flow reserve (FFR) derived from coronary computed tomography angiography data using computation fluid dynamics physiologic simulation software analysis of functional data to assess the severity of coronary artery disease; data preparation and transmission, analysis of fluid dynamics and simulated maximal coronary hyperemia, generation of estimated FFR model, with anatomical data review in comparison with estimated FFR model to reconcile discordant data, interpretation and report</td>
</tr>
<tr>
<td>0502T</td>
<td>Noninvasive estimated coronary fractional flow reserve (FFR) derived from coronary computed tomography angiography data using computation fluid dynamics physiologic simulation software analysis of functional data to assess the severity of coronary artery disease; data preparation and transmission</td>
</tr>
<tr>
<td>0503T</td>
<td>Noninvasive estimated coronary fractional flow reserve (FFR) derived from coronary computed tomography angiography data using computation fluid dynamics physiologic simulation software analysis of functional data to assess the severity of coronary artery disease; analysis of fluid dynamics and simulated maximal coronary hyperemia, and generation of estimated FFR model</td>
</tr>
</tbody>
</table>
0504T Noninvasive estimated coronary fractional flow reserve (FFR) derived from coronary computed tomography angiography data using computation fluid dynamics physiologic simulation software analysis of functional data to assess the severity of coronary artery disease; anatomical data review in comparison with estimated FFR model to reconcile discordant data, interpretation and report

<table>
<thead>
<tr>
<th>Cardiac Imaging Procedure Codes</th>
<th>CPT®</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiac CT</strong></td>
<td></td>
</tr>
<tr>
<td>CT, heart, without contrast, with quantitative evaluation of coronary calcium</td>
<td>75571</td>
</tr>
<tr>
<td>The code set for Cardiac CT and CCTA (CPT® 75572-CPT® 75574), include quantitative and functional assessment (for example, calcium scoring), if performed</td>
<td></td>
</tr>
<tr>
<td>CPT® 75571 describes a non-contrast CT of the heart with calcium scoring and should be reported only when calcium scoring is performed as a stand-alone procedure. Can be used to report a preliminary non-contrast scan which indicates an excessive amount of calcium such that the original scheduled study must be discontinued. CPT® 75571 should not be reported in conjunction with any of the contrast CT/CTA codes (CPT® 75572- CPT® 75574).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Cardiac CT and CCTA</strong></th>
<th>CPT®</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT, heart, with contrast, for evaluation of cardiac structure and morphology (including 3D image post-processing, assessment of cardiac function, and evaluation of venous structures, if performed).</td>
<td>75572</td>
</tr>
<tr>
<td>CT, heart, with contrast, for evaluation of cardiac structure and morphology in the setting of congenital heart disease (including 3D image post-processing, assessment of cardiac function, and evaluation of venous structures, if performed).</td>
<td>75573</td>
</tr>
<tr>
<td>CTA, heart, coronary arteries and bypass grafts (when present), with contrast, including 3D image post-processing (including 3D image post-processing, assessment of cardiac function, and evaluation of venous structures, if performed).</td>
<td>75574</td>
</tr>
<tr>
<td>&quot;Noninvasive estimated coronary fractional flow reserve (FFR) derived from coronary computed tomography angiography data using computation fluid dynamics physiologic simulation software analysis of functional data to assess the severity of coronary artery disease; data preparation and transmission, analysis of fluid dynamics and simulated maximal coronary hyperemia, generation of estimated FFR model, with anatomical data review in comparison with estimated FFR model to reconcile discordant data, interpretation and report</td>
<td>0501T</td>
</tr>
<tr>
<td>Data preparation and transmission</td>
<td>0502T</td>
</tr>
<tr>
<td>Analysis of fluid dynamics and simulated maximal coronary hyperemia, and generation of estimated FFR model</td>
<td>0503T</td>
</tr>
<tr>
<td>Anatomical data review in comparison with estimated FFR model to reconcile discordant data, interpretation and report</td>
<td>0504T</td>
</tr>
<tr>
<td>• (Report 0501T, 0502T, 0503T, 0504T one time per coronary CT angiogram)</td>
<td></td>
</tr>
<tr>
<td>• (Do not report 0501T in conjunction with 0502T, 0503T, 0504T)</td>
<td></td>
</tr>
</tbody>
</table>
3D rendering, (CPT® 76376/CPT® 76377), should not be billed in conjunction with Cardiac CT and CCTA.

- Only one code from the set: CPT® 75572 - CPT® 75574 can be reported per encounter.
- CPT® 75574 includes evaluation of cardiac structure and morphology, when performed; therefore, additional code/s should not be assigned.

I. **CT for Coronary Calcium Scoring (CPT® 75571)**
   A. CT Calcium Scoring for asymptomatic CAD Screening
      1. Coronary calcium scoring as a standalone test is considered investigational in asymptomatic patients with any degree of CAD risk.
      2. **Medicare** policies consider that there is insufficient evidence based data to support performance of Coronary Calcium Scoring.
      3. Texas Heart Attack Preventive Screening Law (HR 1290) mandates that insurers in Texas cover either a calcium scoring study (CPT® 75571 or HCPCS S8092) or a carotid intima-media thickness study (ultrasound—Category III code 0126T) every five years for certain populations. To qualify, the following must apply:
         a. Must be a Texas resident.
         b. Must be a member of a fully-insured Texas health plan.
         c. Must be a man age 45 to 75 or a woman age 55 to 75.
         d. Must have either diabetes or a Framingham cardiac risk score of intermediate or higher.
         e. Must not have had a calcium scoring study or a carotid intima-media thickness study within the past 5 years.
   B. Symptomatic individuals with a ‘very low’, or ‘low’ pretest probability of CAD*, (see Table 1 in **General Issues – Cardiac**)

II. **CTA – Indications for CTA**
   A. Symptomatic individuals who have a ‘low’ or ‘intermediate’ pretest probability of CAD*, (see Table 1 in **General Issues – Cardiac**):
   B. ‘Low’ or ‘intermediate’ pre-test probability of coronary disease with persistent symptoms after a stress test.
   C. Replace performance of invasive coronary angiogram in individuals with low risk of CAD (i.e. Pre-op non-coronary surgery).
   D. For symptomatic individuals, evaluate post-CABG graft patency when only graft patency is a concern and imaging of the native coronary artery anatomy is not needed, such as in early graft failure.
   E. For symptomatic individuals with unsuccessful conventional coronary angiography (i.e. locate a coronary artery, graft, identify the course of an anomalous coronary artery).

III. **CTA – Additional Indications**
   A. Re-do CABG
      1. To identify whether bypass grafts are located directly beneath the sternum, so that alternative ways to enter the chest can be planned.
B. Evaluate coronary artery anomalies and other complex congenital heart
disease of cardiac chambers or great vessels.
      a. To evaluate the great vessels, Chest CTA (CPT® 71275) can be
         performed instead of CCTA or in addition to CCTA. For anomalous
         pulmonary venous return, can add CT abdomen and pelvis with
         contrast (CPT® 74177).
C. Anomalous coronary artery(ies) suspected for diagnosis or to plan treatment
   and less than age 40 with a history that includes one or more of the following:
   1. Persistent exertional chest pain and normal stress test,
   2. Full sibling(s) with history of sudden death syndrome before age 30 or with
documented anomalous coronary artery,
   3. Resuscitated sudden death and contraindications for conventional
      coronary angiography.
D. Unexplained new onset of heart failure.
E. Evaluation of newly diagnosed congestive heart failure or cardiomyopathy.
   1. No prior history of coronary artery disease, the ejection fraction is less
      than 50 percent, and low or intermediate risk on the pre-test probability
      assessment, and
   2. No exclusions to cardiac CT angiography.
   3. No cardiac catheterization, SPECT, cardiac PET, or stress
      echocardiogram has been performed since the diagnosis of congestive
      heart failure or cardiomyopathy.
F. Ventricular tachycardia (6 beat runs or greater) if CCTA will replace
   conventional invasive coronary angiography.
G. Equivocal coronary artery anatomy on conventional cardiac catheterization.
H. Newly diagnosed dilated cardiomyopathy.
I. Preoperative assessment of the coronary arteries in patients who are going to
   undergo surgery for aortic dissection, aortic aneurysm, or valvular surgery if
   CCTA will replace conventional invasive coronary angiography.
J. Vasculitis/Takayasu’s/Kawasaki’s disease
K. Cardiac Trauma: Chest CTA (CPT® 71275) and CCTA (CPT® 75574) are
   useful in detecting aortic and coronary injury and can help in the evaluation of
   myocardial and pericardial injury (see Cardiac Trauma – Imaging).
Practice Note: Relative contraindications for Cardiac/Coronary CT
   • Irregular heart rhythms (e.g., atrial fibrillation/flutter, frequent irregular
     premature ventricular contractions or premature atrial contractions, and
     high grade heart block)
   • Multifocal Atrial Tachycardia (MAT)
   • Inability to lie flat
   • Body mass index of 40 or more
   • Inability to obtain a heart rate less than 65 beats per minute after beta-
     blockers
   • Inability to hold breath for at least 8 seconds
   • Renal Insufficiency
Asymptomatic patients and routine use in the evaluation of the coronary arteries following heart transplantation
- CCTA should not be performed if there is extensive coronary calcification (calcium score >1000).
- Evaluation of coronary stent patency (metal artifact limits accuracy) - <3.0 mm

IV. Evaluation of left ventricular function following myocardial infarction or in chronic heart failure

V. Fractional Flow Reserve by Computed Tomography
   A. Fractional flow reserve (FFR) is typically measured using invasive techniques. FFR can be obtained noninvasively from coronary computed tomography angiography data (FFR-CT).
   B. Indications for FFR-CT
      1. To further assess CAD seen on a recent CCTA that is of uncertain physiologic significance

VI. CT Heart – Indications
   A. If echocardiogram is inconclusive for:
      1. Cardiac or pericardial tumor or mass
      2. Cardiac thrombus
      3. Pericarditis/constrictive pericarditis
      4. Complications of cardiac surgery
   B. Cardiac vein identification for lead placement in patients needing left ventricular pacing.
   C. Pulmonary vein isolation procedure (ablation) for atrial fibrillation
   D. Cardiac MRI (CPT® 75557 or CPT® 75561), chest MRV (CPT® 71555), chest CTV (CPT® 71275), or cardiac CT (CPT® 75572) can be performed to evaluate anatomy of the pulmonary veins prior to an ablation procedure performed for atrial fibrillation
      1. Repeated post-procedure between 3-6 months after ablation because of a 1%-2% incidence of asymptomatic pulmonary vein stenosis.
      2. See Pulmonary Artery and Vein Imaging
   E. Recurrent laryngeal nerve palsy due to cardiac chamber enlargement.
   F. Clinical suspicion of arrhythmogenic right ventricular dysplasia or arrhythmogenic cardiomyopathy (ARVD/ARVC), especially if patient has presyncope or syncope if the clinical suspicion is supported by established criteria for ARVD.
   G. Coronary imaging is not included in the code definition for CPT® 71275.
      1. The AMA definition for CPT® 71275 reads: “CTA Chest (non-coronary), with contrast material(s), including non-contrast images, if performed, and image post-processing.”

VII. Cardiac CT for congenital heart disease (CPT® 75573)
   A. Coronary artery anomaly evaluation
      1. A cardiac catheterization was performed and not all coronary arteries were identified
B. Thoracic arteriovenous anomaly evaluation
   1. A cardiac MRI or chest CT angiogram was performed and suggested congenital heart disease
C. Complex adult congenital heart disease evaluation [One of the following]
   1. No cardiac CT or cardiac MRI has been performed and there is a contraindication to cardiac MRI

VIII. Transcatheter Aortic Valve Replacement (TAVR)
A. Once the decision has been made for aortic valve replacement, the following may be used to determine if a patient is a candidate for TAVR:
   1. CTA of chest (CPT® 71275), abdomen and pelvis (combination code CPT® 74174) are considered appropriate, and
   2. Cardiac CT (CPT® 75572) may be considered to measure the aortic annulus 2 or
   3. Coronary CTA (CCTA CPT® 75574) may be considered to both measure the aortic annulus and assess the coronary arteries in lieu of heart catheterization.
B. Post TAVR:
   1. TAVR follow-up may be approved at 3 months, at one year post-procedure, and annually thereafter

Rule 1: Determination of pretest probability for coronary disease based on chest pain

<table>
<thead>
<tr>
<th>Age-Years</th>
<th>Gender</th>
<th>Typical/Definite Angina Pectoris</th>
<th>Atypical/Probable Angina Pectoris</th>
<th>Non-anginal Chest Pain</th>
<th>Asymptomatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39</td>
<td>Men</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
<td>Very low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>Intermediate</td>
<td>Very low</td>
<td>Very low</td>
<td>Very low</td>
</tr>
<tr>
<td>40-49</td>
<td>Men</td>
<td>High</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>Intermediate</td>
<td>Low</td>
<td>Very low</td>
<td>Very low</td>
</tr>
<tr>
<td>50-59</td>
<td>Men</td>
<td>High</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
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<tr>
<td></td>
<td>Women</td>
<td>Intermediate</td>
<td>Low</td>
<td>Very low</td>
<td>Very low</td>
</tr>
<tr>
<td>≥60</td>
<td>Men</td>
<td>High</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>High</td>
<td>Intermediate</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

High: Greater than 90% pre-test probability
Intermediate: Between 10% and 90% pre-test probability
Low: Between 5% and 10% pre-test probability
Very Low: Less than 5% pre-test probability

Typical angina (definite): 1) Substernal chest pain or discomfort that is 2) provoked by exertion or emotional stress and 3) relieved by rest and/or nitroglycerin.
Atypical angina (probable): Chest pain or discomfort that lacks one of the characteristics of definite or typical angina.
Non-anginal chest pain: Chest pain or discomfort that meets one or none of the typical angina characteristics.
References:


75635 CTA of the Abdominal Aorta and Bilateral Iliofemoral Lower Extremity Runoff

I. Peripheral arterial vascular disease with abnormal ankle brachial index as defined in A1,2 [AND one additional of the following] after failure of a minimum of 3 months of a physician directed walking exercise program
   A. Note: For evaluation of PVD, if meets criteria for MRA abdomen, MRA lower extremity (one only) should be certified. An MRA of the pelvis or another lower extremity should NOT be certified. ABI (ankle brachial index, ankle systolic BP divided by brachial systolic BP)
      1. Rest ABI <0.90 in symptomatic member
      2. Exercise ABI <0.90 in symptomatic member with rest ABI >0.90
      3. Toe brachial index <0.90 or pulse volume recording evidence of peripheral vascular disease if the ABI >1.30
   B. Abnormal pulses
   C. Bruit
   D. Claudication

II. Peripheral arterial vascular disease with abnormal ankle brachial index as defined above in A1,2 [AND one additional of the following]
   A. Arteritis (Takayasu’s arteritis, giant cell arteritis) [One of the following]
      1. ESR >22 mm/hr
      2. Positive ANA
      3. Positive RF or rheumatoid factor
   B. Scleroderma
   C. Hypercoagulable state [One of the following]
      1. Antiphospholipid antibodies
      2. Behçet’s syndrome
      3. Protein C deficiency
      4. Protein S deficiency
      5. Factor V Leiden deficiency
      6. Lupus anticoagulant
      7. Hyperactive platelet syndrome
      8. MRHFR
      9. Anti-cardiolipin antibodies
      10. Elevated homocysteine level
      11. Anti B2 glycoprotein antibodies
      12. Elevated fibrinogen
      13. PTT abnormal
      14. Antithrombin III antibodies
      15. Oral contraceptive use
      16. Hormone replacement
17. Sickle cell anemia
D. Buerger's disease (thromboangiitis obliterans) [Both of the following]
   1. History of smoking
   2. Loss of pulses or decreased pulses in the lower extremity
E. Known atherosclerotic occlusive disease when catheter angiography fails to demonstrate an occult runoff vessel suitable for vascular bypass

References:

75635 CTA of the Abdominal Aorta and Bilateral Iliofemoral Lower Extremity Runoff
The rapid evolution of CT, MRI and ultrasound technology in the last decade permits the acquisition of data sets that can be manipulated by computer software into multiplanar images without exposing patients to additional radiation (CT), or time (MRI). Multiplanar 2D images can be created from a multidetector CT data set almost instantly. These codes are not to be used for 2D multiplanar images created from the original data set for CT, MRI or ultrasound.

These codes refer to 3D images only. In some cases (CTA and MRA and breast MRI) the 3D images are considered to be included in the primary imaging code since these studies should not be interpreted without them. In other circumstances, the 3D images bring additional value to a study and may significantly impact on image interpretation and clinical management.

According to the American College of Radiology these 2 codes should not be used with breast MRI.

The common indications are:

I. **Bone tumor – CT**

II. **Complex facial trauma – CT**

III. **Complex fracture – CT**
   A. Comminuted fractures of the humerus
   B. Comminuted fractures of the femur
   C. Comminuted fractures of the fibula
   D. Comminuted fractures of the tibia
   E. Fractures of the pelvis
   F. Comminuted fractures of the face and/or orbit
IV. Congenital anomalies of the ear – CT
V. Facial malformations -CT
VI. Craniosynostosis – CT
VII. Developmental dysplasia of the hip – CT
VIII. Dislocation of sternoclavicular joint – CT
IX. Eagle’s syndrome – CT
X. Evaluation of the ossicles of the ear – CT
XI. Fracture of the acetabulum – CT
XII. Planning for pectus excavatum or carinatum repair – CT
XIII. Pre-operative planning for congenital anomaly repair
XIV. Pre-operative planning of disc surgery
XV. Pre-operative planning of joint prosthesis – CT
XVI. Pre-operative planning of scoliosis surgery – CT
XVII. Suspicion of fracture with negative x-ray – CT
  A. Pelvis
  B. Scapula
XVIII. Femoroacetabular impingement syndrome – CT
XIX. MRCP – MRI
XX. Gynecologic indications (3D should not be routine with all pelvic sonograms)$^{1-4}$
  A. Anomalies of the uterus (agenesis of the uterus, cervix and/or upper vagina;
     unicornuate anomalies; duplication anomalies such as uterus didelphus;
     bicornuate anomalies; septated uterus; arcuate uterus)
  B. DES exposure
  C. Uterine intra-cavitary lesion when initial US is indeterminate
  D. Hydrosalpinxes or peritoneal cysts when initial US is indeterminate
XXI. Location of an IUD
  A. In symptomatic women (bleeding and/or pain)$^4$
  B. Lost IUD (inability to feel or see IUD string) with initial US
XXII. Echocardiography – echocardiogram
  A. Assessment of left ventricular function
     1. Planned placement of implantable cardioverter-defibrillator
     2. Planned use of cardiotoxic chemotherapy
  B. Congenital heart disease
  C. Valvular stenosis or regurgitation (insufficiency) [Both of the following]
1. Surgery is planned  
2. Transesophageal echocardiogram not performed

XXIII. Spinal fracture – CT

XXIV. Planning for endovascular repair of an aortic aneurysm or thoracoabdominal aneurysm – CT

XXV. Preoperative planning for kidney or renal surgery – CT

XXVI. Preoperative planning for intervention in the liver for primary or metastatic disease – CT

XXVII. Planning for radiation therapy of known primary brain tumor – MRI

XXVIII. Planning for embolization of cerebral aneurysm using results of a catheter angiogram – the catheter angiogram does not require certification from CCN

XXIX. Preoperative planning for brain aneurysm repair – MRI

XXX. 3D Rendering (CPT®76376 or CPT®76377) may be added if ordered by a specialist for sinus surgery preoperative planning

References:

1. Benacerraf BR, Shipp TD, Bromley B. Which patients benefit from a 3D reconstructed coronal view of the uterus added to standard Routine 2D pelvic Sonography, AJR, 2008; 190:626-629.
76380  CT Limited or Localized Follow-up Study

I. Prior positive CT or other imaging study that is being followed either at intervals to assess therapy or to clarify a finding. This is commonly used for sinus imaging and must meet the criteria for 70486, but may be used for MRI or CT of the chest and abdomen and must meet the corresponding criteria (See 71250-71270 or 74177-74178, 74160-74170, 72193-72194)

II. One time repeat imaging for sinusitis may be approved if:1-4 (One of the following)
   1. An ENT specialist requests the imaging AND there is no improvement after an additional 4 weeks of conservative treatment after initial imaging was completed AND there has been a follow-up visit since the previous imaging
   2. If there is a new abnormality on exam such as obstructing mass

References:
4. Wald E, et. el., Sinusitis in Children Aged 1 to 18 Years Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial, Pediatrics 2013;132:e262
This procedure is considered to be investigational/ experimental.
76498 Unlisted Magnetic Resonance Procedure (e.g. Diagnostic, Interventional)

I. Radiation therapy treatment planning

A. Prostate Cancer [One of the following]
   1. Intensity Modulated Radiation Therapy (IMRT)
   2. Stereotactic Body Radiation Therapy (SBRT)
   3. Proton Therapy

B. Central nervous system (CNS) tumors, including primary and metastatic lesions involving the brain for Stereotactic Radiosurgery (SRS)

C. CPT®76498 for Unlisted MRI – when MRI will be used for treatment planning of radiation therapy to be delivered ONLY to the brain, prostate and cervix. The use of this code for radiation treatment planning of any other cancers/body parts not listed above, may be reviewed on a case-by-case basis and should be sent for Medical Director Review

D. Custom knee Arthroplasty planning if covered by payor (not as Alternative Recommendation)

E. Any procedure/surgical planning if thinner cuts or different positional acquisition (than those on the completed diagnostic study) are needed. These could include sinus surgery or navigational bronchoscopy

F. Studies done for navigation and planning for neurosurgical procedures (i.e. Stealth or Brain Lab Imaging)

II. All other requests for this procedure are redirected to the nearest 70000 series code that corresponds to the procedure being requested.

References:


76498 Unlisted Magnetic Resonance Procedure (e.g. Diagnostic, Interventional):
As of January 1, 2014 imaging guidance is included with the biopsy codes for breast biopsies. The proper way to bill an MRI guided breast biopsy is CPT code 19085 [Biopsy, breast, with placement of breast localization device(s) (e.g., clip, metallic pellet), when performed, and imaging of the biopsy specimen, when performed, percutaneous; first lesion, including MRI guidance]. Additional lesions should be billed using 19086.

I. Prostate biopsy\(^1-5\) [One of the following]
   A. Suspected Prostate cancer and at least 1 negative/nondiagnostic. Transrectal ultrasound guided biopsy and one of the following:
      1. Continued increase in PSA
      2. Abnormal digital rectal exam
   B. Focal prostatic intraepithelial neoplasia
   C. Routine use of MRI – guided biopsy or MR/US fusion biopsy for initial diagnosis or for monitoring patients on active surveillance is considered experimental/investigational at this time

References:

Screening breast MRI should not be performed more frequently than once every 11 months

I. To detect silicone implant rupture in symptomatic patients whose ultrasound shows no rupture

II. To detect suspected local tumor recurrence in breast cancer patients who have undergone mastectomy and breast reconstruction with an implant or tissue transfer flaps (rectus, latissimus dorsi, or gluteal)

III. Patient with new diagnosis of breast cancer including DCIS

IV. To detect local tumor recurrence in patients with a personal history of breast cancer and scarring from prior biopsies, radiation or surgery that results in uninterpretable mammography and ultrasound

V. To detect the extent of residual cancer in the recently postoperative breast with positive pathological margins after incomplete lumpectomy when the patient still desires breast conservation and local re-excision is planned

VI. To localize the site of primary occult breast cancer in patients with adenocarcinoma suggestive of breast cancer discovered as axillary node metastasis or distant metastasis without focal findings on physical examination or on mammography/ultrasonography

VII. To evaluate patients with high genetic risk of breast cancer\(^6,12\) (This is not considered to be medically necessary or reasonable for Medicare beneficiaries) [One of the following]

A. Patient is a confirmed carrier of BRCA1 or BRCA2 gene mutations

B. Patient has a first-degree relative (mother, sister, daughter) who is a confirmed carrier of the BRCA1 or BRCA2 gene mutation

C. Patient has a first-degree relative (mother, sister, daughter) diagnosed with breast cancer at or before age 50. MRI surveillance to begin at age 25, or 10 years prior to age at diagnosis of index relative, whichever is later

D. Male relative with breast cancer

E. Gail model (or similar risk model) lifetime risk of 20% or more
F. One or more relatives with either 2 breast cancers or both breast and ovarian cancer

G. Two or more first degree relatives with breast cancer or ovarian cancer diagnosed at least one of whom was diagnosed with invasive breast cancer at age 40 or less or ovarian cancer diagnosed at any age

H. Personal or first degree relative (mother, sister, daughter) with the following high risk genetic markers (similar to BRCA 1 or 2) screening to start at age 25:
   1. Li-Fraumeni Syndrome (screening may start at age 20)
   2. Cowden's Syndrome
   3. Bannayan-Riley-Ruvalcaba Syndrome
   4. ATM (Ataxia-telangiectasia mutated)
   5. CDH1
   6. CHEK2
   7. NBN
   8. NF1 (Neurofibromatosis Type 1)
   9. PALB2
   10. STK11
   11. TP53

VIII. History of radiation therapy to the chest between the ages of 10 and 30; start MRI screening 10 years after completion of radiation therapy, or at age 25, whichever is later

IX. Indeterminate breast imaging [One of the following]
   A. Patients with indeterminate mammograms and sonograms may be approved if there is new onset of [One of the following]
      1. Nipple retraction
      2. Unilateral drainage from the nipple that is bloody or clear
   B. All other requests for breast MRI based on indeterminate mammography and/or ultrasound that do not meet the above criteria must be sent for physician review. All imaging reports should be requested and available for the medical director to review. Only a physician may approve a breast MRI on the basis of abnormal mammography and/or ultrasound

X. Breast MRI for ANY of the following indications is not covered because there is insufficient scientific evidence to support its use:
   A. To confirm implant rupture in symptomatic patients whose ultrasonography shows rupture especially with implants >10 years old (ultrasound sufficient to proceed with removal)
   B. To screen for breast cancer in women who do not have a high genetic risk
   C. To evaluate breasts before biopsy in an effort to reduce the number of surgical biopsies for benign lesions
   D. To differentiate benign from malignant breast disease, especially clustered microcalcifications
   E. To differentiate cysts from solid lesions (ultrasound indicated)
XI. Neoadjuvant chemotherapy [One of the following]
   A. Prior to the start of chemotherapy
      1. No prior breast MRI after the diagnosis of breast cancer
   B. At the end of planned neoadjuvant chemotherapy to evaluate response prior to surgery

XII. Patients with a history of LCIS, ADH or ALH - annual screening with breast MRI is indicated\textsuperscript{13,14}

XIII. State Specific Breast Density Laws
   A. Breast density notification laws have been put into effect by many states. Breast density notification laws vary, but some also contain mandates for additional imaging, which may include MRI and/or ultrasound. For applicable requests involving members in these states, their legislative mandates should be followed.
   B. Arkansas
      1. Regardless of age, Breast US coverage must be approved if a comprehensive screening mammogram demonstrates heterogeneously dense or extremely dense breast tissue when the woman’s primary healthcare or radiologist determines comprehensive ultrasound screening is medically necessary.
      2. Coverage for screening breast MRI not addressed in this legislation.
   C. Connecticut
      1. Ultrasound screening of entire breast or breasts for heterogeneous or dense breast tissue based on BIRADS classification OR if woman is believed to be at increased risk for breast cancer due to family history or prior personal history of breast cancer, positive genetic testing, or other indications as determined by a woman’s physician or advanced practice registered nurse.
      2. Breast MRI per guidelines established by the American Cancer Society.
   D. Illinois
      1. Coverage for screening breast ultrasound and screening breast MRI when deemed medically necessary by a physician licensed to practice medicine in all of its branches.
   E. Indiana
      1. Breast ultrasound and breast MRI per guidelines of any of the following professional organizations (eviCore guidelines follow these):
         a. The American College of Radiology;
         b. The American Cancer Society;
         c. The American Medical Association;
         d. The American Society of Clinical Oncology;
         e. The United States Preventative Services Taskforce;
         f. The Society of Breast Imaging; or
         g. A like professional medical society
         h. Any other actions that are clinically indicated as determined by the physician using the physician’s professional judgment
   F. New Jersey
1. Ultrasound evaluation, a magnetic resonance imaging scan or other additional testing of an entire breast or breasts, after a baseline mammogram examination, if the mammogram demonstrates extremely dense breast tissue, if the mammogram is abnormal within any degree of breast density including not dense, moderately dense, heterogeneously dense, or extremely dense breast tissue, or if the patient has additional risk factors for breast cancer including but not limited to family history of breast cancer, prior personal history of breast cancer, positive genetic testing, extremely dense breast tissue based on the Breast Imaging Reporting and Data System established by the American College of Radiology, or other indications as determined by the patient’s health care provider. The coverage required under this paragraph may be subject to utilization review, including periodic review, by the medical service corporation of the medical necessity of the additional screening and diagnostic testing.

G. New York
1. Additional screening coverage not mandated by law. New York law only stipulates that breast ultrasound and MRI that are covered under the member’s policy are not subject to copay’s and deductibles.

H. Florida has legislation in progress but not yet passed/signed into legislation.
I. The Following States have Breast Density Notification Laws that DO NOT currently include an insurance coverage mandate:
   1. Alabama, Arizona, California, Colorado, Delaware, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia
References:

3. FDA Update on the Safety of Silicone Gel-Filled Breast Implants June 2011 Center for Devices and Radiological Health U.S. Food and Drug Administration.

77058, 77059 MRI of the Breast
I. **Marrow reconversion** [One of the following]
   A. Severe anemia’s, especially thalassemia
   B. X-ray findings of:
      1. Expansion of medullary flat bones
      2. Bilateral paraspinal masses (particularly in the thorax)
      3. Pleural-based masses

II. **Marrow infiltration or replacement** [One of the following]
   A. Leukemia
   B. Lymphoma
   C. Metastasis
   D. Primary bone tumors
   E. Plasmacytoma
   F. Multiple myeloma

III. **Myeloid depletion**
    A. Untreated aplastic anemia

IV. **Bone marrow ischemia** [One of the following]
   A. Trauma
   B. Sickle cell anemia
   C. Endogenous (Cushing’s syndrome) and exogenous corticosteroid excess
   D. Dysbaric osteonecrosis (generally called “the bends”)
   E. Alcoholism
   F. Gaucher’s disease

V. **Marrow response after radiation therapy**

VI. **Multiple Myeloma and Plasmacytomases**
    A. Initial Workup/Staging for any one of the following:
       1. Abnormal skeletal survey
       2. Negative/equivocal skeletal survey with abnormal myeloma labs and/or symptoms of multiple myeloma
    B. Restaging/Recurrence for any one of the following:
       1. Suspected relapse/recurrence
       2. Suspected progression of MGUS or SMM to a more malignant form
       3. To determine therapy response with inconclusive labs

VII. **Liver Transplant – Pre transplant workup**
    A. Once while on liver transplant waiting list
    B. Maybe repeated immediately prior to liver transplant
78012 Thyroid Uptake, Single or Multiple Quantitative Measurement(s) (Including Stimulation, Suppression, or Discharge, When Performed)

A thyroid uptake scan can help distinguish between different causes of hyperthyroidism (Graves’ disease, toxic adenoma, multinodular goiter, and thyroiditis)

I. Hyperthyroidism and/or subacute thyroiditis1-7 [One of the following]
   A. TSH < 0.40 mU/L and freeT4 (>1.8ng/dL)
   B. Subclinical hyperthyroidism
   1. TSH < 0.1 mU/L and normal free T4 (0.7-1.8 ng/dL) or free T3 (0.2-0.5ng/dL)
   C. Neck pain with no history of trauma and normal thyroid function

References:

7. Donangelo I, and Braunstein GD, Update on subclinical hyperthyroidism, Am Fam Physician, 2011; 83:933-938.
78013 Thyroid Imaging (Including Vascular Flow, When Performed)

I. Thyroid nodule\textsuperscript{1,2} [One of the following]
   A. US guided FNA contraindicated
   B. US guided FNA (after at least 2 attempts) reported as showing results that are “equivocal,” “indeterminate,” “suspicious,” “follicular lesion,” or “follicular neoplasm”
   C. TSH decreased <0.40 mU/L

II. Substernal goiter\textsuperscript{1}
   A. Clinical findings [One of the following]
      1. Exertional dyspnea
      2. Wheezing
      3. Cough
      4. Dysphagia

References:

1. American Association of Clinical Endocrinologists, Associazione Medici Endocrinologi, and European Thyroid Association, Medical guidelines for clinical practice for the diagnosis and management of thyroid nodules, Endocrine Practice, 2010; 16 (Suppl1); 1-43.
Thyroid Imaging (Including Vascular Flow, When Performed); with Single or Multiple Uptake(s) Quantitative Measurement(s) (Including Stimulation, Suppression, or Discharge, When Performed)

I. Hyperthyroidism¹-⁶
   A. TSH <0.40mU/L and free T4 >1.8ng/dL
   B. Subclinical hyperthyroidism
      1. TSH <0.1mU/L and normal free T4 (0.7-1.8 ng/dL) or free T3 (0.2-0.5ng/dL)

II. Thyroid nodule⁴,⁷,⁸ [One of the following]
   A. US guided FNA contraindicated
   B. US guided FNA (after at least 2 attempts) reported as showing results that are “equivocal,” “indeterminate,” “suspicious,” “follicular lesion,” or “follicular neoplasm”
   C. TSH decreased <0.40mU/L

III. Substernal goiter⁴,⁸
   A. Clinical findings [One of the following]
      1. Exertional dyspnea
      2. Wheezing
      3. Cough
      4. Dysphagia

IV. Congenital hypothyroidism⁹ [One of the following]
   A. Infant recently diagnosed
   B. Repeat assessment, child of 3 years of age
References:


5. American Association of Clinical Endocrinologists Thyroid Task Force. Medical guidelines for clinical practice for the evaluation and treatment of hyperthyroidism and hypothyroidism, Endocrine Practice, 2002; 8:457-469

6. Donangelo I, and Braunstein GD, Update on subclinical hyperthyroidism, Am Fam Physician, 2011; 83:933-938.


I. Suspected, recurrent, or metastatic differentiated or functioning thyroid cancer after thyroidectomy¹-⁸ [One of the following]

A. Established diagnosis of Follicular, Papillary and Hürthle Cell Carcinomas
   1. Whole body thyroid nuclear scan is coded with CPT® 78018. If CPT® 78018 is obtained and found to be positive, CPT® 78020 may be approved as an add-on test to evaluate the degree of iodine uptake

B. Post-thyroidectomy to assess thyroid remnant for one of the following:
   1. Extent of thyroid remnant cannot be accurately ascertained from the surgical report or neck ultrasound
   2. When the results may alter the decision to treat
   3. Prior to administration of RAI therapy
   4. Skeletal pain

C. Known diagnosis of thyroid cancer and evidence of residual thyroid tissue after thyroidectomy or after ablation

D. Known diagnosis of follicular or papillary thyroid cancer with suspected recurrence after thyroidectomy and ablation
   1. Any measurable level of thyroglobulin while on thyroid hormone replacement (resulting in TSH secretion being suppressed)
   2. New neck mass on ultrasound of physical examination, or FNA demonstrating thyroid cancer metastasis
   3. Annual exams until negative scan for iodine responsive tumors with positive thyroglobulin or known distant metastases
   4. Thyroglobulin levels increasing without Thyrogen® stimulation
   5. Thyroglobulin levels >2 after Thyrogen® stimulation
   6. Thyroglobulin levels after Thyrogen® stimulation are higher than previous levels after stimulation
   7. Anti-thyroglobulin antibody present (scan may be certified every 12 months)
References:

3. Mazzaferri EL, Kloos RT. Is diagnostic iodine-131 scanning with recombinant human TSH useful in the follow-up of differentiated thyroid cancer after total thyroid ablation? JCEM, 2002; 87:1490-1498.
8. Tuttle RM, Haddad RI, Ball DW, et al, National Comprehensive Cancer Network (NCCN) Guidelines Version 2.2014, Thyroid Cancer. http://www.nccn.org/professionals/physician_glsls/pdf/thyroid.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Thyroid Cancer V2.2014. ©2014 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.
These scans are used for preoperative planning for an individual with chemically documented primary hyperparathyroidism.

I. **Enlarged parathyroid gland, parathyroid hyperplasia or suspected parathyroid adenoma or carcinoma for preoperative planning**\(^1-5\)
   A. Serum calcium 1 mg/dL above the normal range
   B. Elevated Serum calcium level and elevated parathyroid hormone level.

References:

5. Greenspan BS, Dillehay GL, Intenzo C. SNM practice guideline for parathyroid scintigraphy 4.0*. [http://interactive.snm.org/docs/Parathyroid_Scintigraphy_V4_0_FINAL.pdf](http://interactive.snm.org/docs/Parathyroid_Scintigraphy_V4_0_FINAL.pdf).
Adrenal Nuclear Imaging Cortex and/or Medulla

Study for the evaluation of the adrenal gland is either CT or MRI. Nuclear medicine imaging can assist in the evaluation of adrenal masses not adequately characterized by CT or MRI. These tests are also helpful in the detection of metastatic disease

I. Adrenal mass not sufficiently characterized by CT or MRI1-21

[One of the following]
A. Distinguish adenomas from hyperplasia [One of the following]
   1. Elevated cortisol (Cushing’s syndrome) [Both of the following]
      a. 24 hr urine free cortisol >100mcg/24hr
      b. No suppression by dexamethasone
   2. Elevated aldosterone and hypertension (systolic >160 and diastolic >100 that is resistant to medication (Conn’s syndrome)
      a. Spontaneous or diuretic induced hypokalemia [One of the following]
         i. Serum potassium <3.5mEq/L
      b. Plasma aldosterone to rennin ratio > 20
   3. Elevated androgens [One of the following]
      a. Virilization in women (hirsutism, acne, hair loss, polycystic ovary syndrome)
      b. Waist hip ratio of >0.8
      c. Dexamethasone suppression test with the testosterone and DHEAS suppressed
B. Evaluation of pheochromocytoma [Both of the following]
   1. Hypertension
   2. Abnormal laboratory tests [One of the following]
      a. Urinary VMA >7 mg/24 hours
      b. 24 hour metanephrine-free epinephrine and norepinephrine >100 µg
      c. 24 hour total metanephrine >1.3mg
C. Evaluation of neuroblastoma
   1. Urinary VMA > 7 mg/24 hours
D. Evaluation of ganglioneuroma
E. Evaluation of ganglioneuroblastoma
F. Evaluation of paraganglioneuroma
G. May have history of MEN (multiple endocrine neoplasms) type IIA (Sipple syndrome) [One of the following]
   1. Medullary carcinoma of thyroid
   2. Pheochromocytoma [See B above]
H. History of neurofibromatosis
I. History of von Hippel-Lindau disease
   1. Pheochromocytoma [See B above]
II. Primary aldosteronism (Conn’s syndrome)$^{3,16}$ (See I.A.2. above)

III. Cushing’s syndrome$^{3,17}$ (See I.A.1. above)

IV. Pheochromocytoma$^{3-10}$ (See I.B. above)

V. Hyperandrogenism$^{18-21}$ (See I.A.3. above)

References:


78075 Adrenal Nuclear Imaging
These studies are rarely performed. Marrow imaging is best done with MRI

I. **Determine extent of marrow in myeloproliferative disorders**¹

II. **Detection of ischemic or infarcted regions in sickle cell disease**

III. **Dysbaric osteonecrosis (generally called “the bends”)**

IV. **Suspected or known avascular necrosis (MRI) (osteonecrosis, OCD, AVN, and osteochondritis dissecans) with pain and recent x-ray which is either negative or non-diagnostic [Risk factor and (history or physical finding)] except for the hip**

A. Risk factors and pain [One of the following]
   1. Steroid use
   2. Sickle-cell disease
   3. Excessive alcohol use
   4. HIV infection
   5. SLE
   6. Renal transplant
   7. Trauma [One of the following]
      a. Fracture
      b. Dislocation
   8. Coagulopathy
   9. Bisphosphonates
   10. Smoking

B. **Shoulder**
   1. Physical findings and history [One of the following]
      a. Catching
      b. Locking
      c. Clicking
      d. Grinding
      e. Crepitus
      f. Stiffness
      g. Tenderness
      h. Pain at rest and/or at night
      i. Pain increases with activity

C. **Elbow with a negative x-ray and pain**
   1. Physical findings and history [One of the following]
      a. Catching
      b. Locking
c. Clicking

d. Grinding

e. Crepitus

f. Stiffness

g. Tenderness

D. Wrist and hand

1. Physical findings and history [One of the following]

a. Catching

b. Locking

c. Clicking

d. Grinding

e. Crepitus

f. Stiffness

g. Tenderness

E. Knee

1. Physical findings and history [One of the following]

a. Catching

b. Locking

c. Snapping

d. Inability to bear weight

e. Popping

f. Swelling

g. Tenderness

h. Giving way

i. Stiffness

j. Crepitus

F. Ankle

1. Physical findings and history [One of the following]

a. Swelling

b. Stiffness

c. Weakness

d. Symptoms exacerbated by prolonged standing

e. Joint effusion

f. Instability

g. Giving way

h. Catching

i. Grinding

G. Hip [One of the following]

1. Radiography with a collapsed femoral head

2. Pain in the hip(s) with a suspicious but non diagnostic x-ray

3. Hip pain with normal x-ray and a risk factor in A

V. Detection of asymmetric marrow distribution in tumors¹ such as

A. Myeloma

B. Hodgkin’s disease

C. Metastatic disease
VI. Staging of polycythemia rubra vera, myelofibrosis and aplastic anemia

VII. Osteomyelitis\(^1\) (MRI) (Three phase bone scan 78315 may be used if MRI is contraindicated. For chronic osteomyelitis in labeled WBC scan see 78805-78807 with a marrow scan) [One of the following]

A. Clinical and laboratory findings [One of the following]
   1. Aural temperature > 38.3°C or 100.9°F
   2. Leukocytosis, WBC >11,500/cu.mm
   3. Blood culture positive
   4. X-ray suggestive of osteomyelitis
   5. ESR > 22 mm/hr
   6. C-reactive protein > 10 mg/L

B. History of diabetes, dialysis or peripheral vascular disease

C. History of penetrating injury or surgery near the involved bone

D. Sinus tract, poor wound or fracture healing

E. Preoperative evaluation of known osteomyelitis

F. Positive probe to bone test

G. Post treatment evaluation

H. Infection of prosthesis or other orthopedic hardware

I. Chronic wound overlying surgical hardware

J. Chronic wound overlying a fracture

K.Exposed bone

General statement:
In the presence of orthopedic hardware or prosthesis, normal bone marrow is disrupted and displaced, making interpretations difficult in these regions. Comparison of 111 In-leukocyte localization with 99 mTc-sulfur colloid uptake using combined of sequential 111 In-leukocyte/99mTc colloid images is often necessary. Comparison with adjacent or contralateral regions can also be helpful

A white-cell scan should be accompanied by a bone marrow scan using Tc 99m sulfur colloid performed either together or sequentially. 111 In-leukocyte uptake is typically increased in the vicinity of infected orthopedic hardware and normal or loose but non-infected prosthesis. Infection is likely when there is abnormal 111 In-leukocyte localization without corresponding 99 m Tc-sulfur colloid bone marrow activity (discordant activity)

References:
78185 Spleen Imaging Only with or without Vascular Flow

This is rarely used. CT for most indications imaging modality to evaluate the spleen

I. If CT is not available 78185 can be used [One of the following]
   A. Suspected splenic trauma
   B. Spleen size
   C. LUQ mass
   D. Suspected splenic
      1. Metastases
      2. Cysts
      3. Abscess
      4. Infarct

II. Localization of spleen for radiation ports (if no radiation treatment planning CT is available)

III. Asplenia

IV. Suspected functional accessory spleen

V. Evaluation of splenic function

VI. Non-specific symptoms in LUQ (if neither ultrasound nor CT is available)

References:

78195  Lymph System Imaging (Lymphoscintigraphy)

I. Sentinel node mapping1-8 [One of the following]
   A. Must have tissue diagnosis of:
      1. Breast cancer [One of the following]
         a. Stage T1 or T2
         b. DCIS if mastectomy is planned
         c. Area of DCIS by imaging is ≥ 5 cm
         d. Multicentric disease
      2. Melanoma
         a. Breslow thickness 1 mm or more
      3. Merkel cell carcinoma
      4. Head and neck cancer if not clinically positive

II. Lymphedema of the lower extremity9 [One of the following]
   A. Must have negative venous Doppler including evaluation for valvular insufficiency
   B. History of Milroy’s disease
   C. Previous pelvic lymph node biopsy, dissection

References:


These studies are rarely indicated (CT, US and MRI should be done if available)

I. Evaluation of one of the following only if US, CT, and MRI are not available or elevated renal function or decreased glomerular filtration rate contraindicate the use of CT or MRI
   A. Masses
   B. Trauma
   C. Evaluation of focal nodular hyperplasia

II. Differentiating hepatic hemangiomas and focal nodular hyperplasia (FNH) from other hepatic masses if CT or MRI are contraindicated ¹,²

III. Diffuse hepatic disease such as cirrhosis, hepatitis²

IV. Elevated liver function tests²

V. Evaluation of hepatic artery catheters for chemotherapy infusion³

VI. Chemoembolization with radioactive spheres (TheraSphere® or SIR Spheres®)
   A. Liver imaging with SPECT. This should be approved once if Theraspheres are used and twice for SIR Spheres

VII. Accessory spleen

References:


78201, 78202, 78205, 78206 Liver Imaging and 78215, 78216 Liver and Spleen Imaging
I. Strong clinical consideration of gallbladder disease [One of the following]
   A. US negative or equivocal or,
   B. Suboptimal ultrasound study in a morbidly obese patient.

   NOTE: If the gallbladder does not fill during the study it may be necessary to give
   Morphine. The study may be converted at the time of imaging to CPT® 78227. The
   member will not need to return for a second study with a second injection of
   radiopharmaceutical.

II. Suspected bile leak after trauma or surgery\(^3,4\)

III. Evaluation of liver function\(^3,4\) [One of the following]
   A. Pre-operative assessment of post-operative remnant
   B. Monitoring of liver regeneration

IV. Assessment of liver transplant

V. Assessment of choledochal cyst

VI. Prior to partial hepatectomy

References:
   College of Radiology Appropriateness Criteria – Right Upper Quadrant Pain.
2. Weissmann GS, Frank MS, Bernstein LH, et al. Rapid and accurate diagnosis of acute cholecystitis
   with 99mTc-HIDA cholescintigraphy, AJR, 1979; 132:523-528.
   hepatobiliary scintigraphy. ACR Practice Guideline; 2008:1-5. Practice Guideline for the Performance
   of Hepatobiliary Scintigraphy.
This study may be performed by itself or CPT® 78226 may be converted to CPT® 78227 during the course of the examination. CPT® 78227 is used for the evaluation of gallbladder ejection fraction or dysfunction of the sphincter of Oddi. For the evaluation of acute cholecystitis with a non-diagnostic ultrasound and clinical findings such as RUQ pain or tenderness or an ultrasonic Murphy's sign, CPT® 78226 should be done. However, if the gallbladder does not fill during the study it may be necessary to give Morphine. The study may be converted at the time of imaging to CPT® 78227. If this is required, eviCore should be notified and given the reason that a pharmacologic agent was required. A request for a code change to CPT® 78227 should also be made. The member should never be asked to return for a second study with a second injection of radiopharmaceutical.

I. **Strong clinical consideration of gallbladder disease [One of the following]**
   A. US negative or equivocal or,
   B. Suboptimal ultrasound study in a morbidly obese patient.

   NOTE: If the gallbladder does not fill during the study it may be necessary to give Morphine. The study may be converted at the time of imaging to CPT® 78227. The member will not need to return for a second study with a second injection of radiopharmaceutical.

II. **Chronic acalculous cholecystitis**[^3-5] [Both of the following] (This usually occurs in hospitalized individuals)
   A. Recurrent right upper quadrant abdominal pain
   B. No evidence of gallstones on ultrasound

III. **Dysfunction of sphincter of Oddi**[^4,5] [Both of the following]
   A. Recurrent epigastric or right upper quadrant pain
   B. No evidence of gallstones on ultrasound if the gallbladder is present

IV. **Calculation of gallbladder ejection fraction or biliary dyskinesia—usually no gallstones are found on ultrasound but there is persistent RUQ pain**
References:

I. Evaluation of parotid masses to allow preoperative diagnosis of Warthin’s tumor¹

II. Evaluation of salivary gland function in patients with dry mouth¹
   [One of the following]
   A. Xerostomia
   B. Sjögren’s syndrome
   C. Sialadenitis
   D. After head and neck irradiation

III. Evaluation of children with cerebral palsy

Reference:

I. Dysphagia [Both of the following]
   A. Chest pain
   B. Difficulty swallowing solids initially and then liquids

II. Gastroesophageal reflux
**78261 Gastric Mucosa Imaging**

I. **Evaluation of:**¹⁻⁵ [One of the following]
   A. Meckel’s diverticulum
      1. History of lower GI bleeding, usually bright red per rectum
         a. Meckels has ectopic mucosa which concentrates radiopertechnitate. It most often presents with lower GI bleeding.
   B. Barrett’s esophagus
      1. Must have clinical history of dyspepsia or esophagitis

II. **Evaluation of pulmonary or mediastinal masses suspected of containing gastric mucosa**⁵,⁶

References:

I. **Confirmation of GE reflux**
   A. Pediatric [One of the following]
      1. Symptomatic
         a. Vomiting
         b. Belching
         c. Failure to thrive
         d. Refusal of food
         e. Chest pain
      2. Asymptomatic
         a. Family history of Barrett’s esophagus or esophageal carcinoma
   B. Adult [One of the following]
      1. Chronic heartburn
      2. Dysphagia
      3. Family history of Barrett’s esophagus or esophageal carcinoma
**78264 Gastric Emptying Imaging Study (e.g. solid, liquid, or both)**

**78265 Gastric Emptying Imaging Study (e.g. solid, liquid, or both); with small bowel transit**

**78266 Gastric Emptying Imaging Study (e.g. solid, liquid, or both); with small bowel transit, multiple days**

Only one code is approved for evaluation of liquids and/or solids. These can both be performed on the same date of service.

I. **Delayed gastric emptying in patients\(^1-5\) (gastroparesis)[One of the following]**
   A. Symptoms
      1. Nausea
      2. Vomiting of old food ingested several hours earlier
      3. Bloating
      4. Early satiety
      5. Postprandial fullness, nausea, vomiting, or recurrent aspiration
      6. Unexplained poor glucose control in diabetes
      7. Gastroesophageal reflux refractory to medical management
      8. Chronic intestinal pseudoobstruction
      9. Non-ulcer dyspepsia

II. **Pediatric patients with gastroesophageal reflux or rumination syndrome and suspicion of delayed gastric emptying\(^6-8\)**

III. **Rapid gastric emptying\(^3,6\) (dumping syndrome)**
   A. Symptoms [One of the following]
      1. Crampy abdominal discomfort
      2. Nausea
      3. Diarrhea
      4. Belching
      5. Diaphoresis
      6. Lightheadedness
References:


I. Evaluation of lower GI bleeding\textsuperscript{1-3} [All of the following]
   A. Hematest positive stool
   B. Indeterminate colonoscopy of lower GI bleeding
   C. Active GI bleeding

References:

I. **Findings [One of the following]**
   A. Decreased plasma albumin or globulins
   B. Peripheral edema or anasarca
   C. No active GI bleeding
I. Evaluation for ectopic gastric mucosa\textsuperscript{1,2} [One of the following]
   A. Active GI bleeding
   B. Unexplained anemia with guaiac positive stools

References:
78291 Peritoneal-Venous Shunt Patency

Approve for evaluation of shunt patency and function in a patient with ascites (LeVeen shunt, Denver shunt)
A SPECT scan may be approved for any of the indications for which a bone scan can be approved. If the request is for 78300 and 78320 then only the 78320 is to be approved if medical necessity is established. If the request is for 78305 or 78306 and 78320 then you may approve 2 codes if medical necessity is established.

I. Known or suspected metastases to the bone
   A. Any prior or current malignancy with one of the following:
      1. Bone pain
      2. Rising tumor markers
      3. Elevated alkaline phosphatase
   B. Breast Cancer[One of the following]
      1. Initial evaluation of patient with new diagnosis of breast cancer clinical stage III or higher when locoregional therapy is planned
      2. Any clinical stage with localized bone pain
      3. Elevated alkaline phosphatase - with any clinical stage
      4. Suspected recurrence based on one of the following:
         a. Elevated LFTs or ALP
         b. Rising tumor markers
         c. Signs or symptoms of recurrence
         d. Biopsy proven recurrence
      5. Known bony metastases
         a. Patients receiving chemotherapy - every 2 cycles
         b. Patients receiving endocrine therapy every 3 months
      6. Surveillance (persistent measurable disease and off therapy) – every 3 months for up to 5 years
   C. Prostate cancer [One of the following]
      1. Initial workup of a patient with new diagnosis of prostate cancer if there is a life expectancy of 5 years or more and one of the following
         a. T2 with PSA >10 ng/mL
         b. T3 or higher with any PSA level
         c. Any T with PSA >20ng/mL
         d. Gleason score ≥7
         e. Symptoms of bone pain
      2. Suspected recurrence after prior treatment and one of the following:
         a. PSA rising on 2 consecutive measurements while on endocrine/hormonal therapy
         b. After prostatectomy, PSA remains elevated at >0.2 or initially undetectable PSA increases on 2 consecutive measurements
c. After radiation therapy, PSA rises on 2 consecutive measurements above post-XRT baseline
d. Bone pain

D. Small cell lung cancer
1. Initial staging
2. Treatment response every 2 cycles of chemotherapy for known bony metastases
3. Suspected recurrence based on new symptoms/signs
4. If PET/CT is not available for initial staging

E. Non small cell lung cancer
1. Initial staging
2. Treatment response every 2 cycles of chemotherapy for known bony metastases
3. Suspected recurrence based on new symptoms/signs

II. Primary bone tumors
A. Osteogenic sarcoma of a long bone
   1. Initial staging (if PET scan not available)
   2. Restaging after completion of neoadjuvant chemotherapy
   3. During chemotherapy – every 2 cycles
   4. At the end of planned chemotherapy
   5. Surveillance – every 3 months for 1 year, then every 6 months for 2 years, then annually for 2 years after completion of all therapy
B. Ewing’s sarcoma
   1. Initial staging (if PET scan not available)
   2. Restaging after completion of neoadjuvant chemotherapy
   3. During chemotherapy – every 2 cycles
   4. At the end of planned chemotherapy
   5. Surveillance – every 3 months for 1 year, then every 4 months for 1 years, then every 6 months for 1 year and then annually for 2 years after completion of all therapy
C. Chordoma
   1. Initial staging
   2. Monitoring response to chemotherapy- every 2 cycles
D. Giant cell tumor of the bone
   1. Initial staging
   2. Monitoring response to chemotherapy- every 2 cycles

III. Suspected Occult/Stress/Insufficiency Fracture/Stress Reaction
A. For suspected hip/femoral neck, tibia, pelvis/sacrum, tarsal navicular, proximal fifth metatarsal, or scaphoid occult/stress/insufficiency fractures, and suspected atypical femoral shaft fractures related to bisphosphonate use, MRI without contrast can be performed if the initial evaluation of history, physical exam and plain X-ray fails to establish a definitive diagnosis
1. CT without contrast can be performed as an alternative to MRI for suspected insufficiency fractures of the pelvis/hip and suspected atypical femoral shaft fractures related to bisphosphonate.

2. Tc-99m Bone scan whole body (CPT® 78306) with SPECT of the area of interest (CPT® 78320) is indicated for suspected fractures if MRI cannot be performed.

3. Tc-99m Bone scan Foot (CPT® 78315) is indicated for suspected occult or stress fractures of the tarsal navicular.

B. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:
   1. Repeat plain X-rays remain non-diagnostic for fracture after a minimum of 10 days of provider-directed conservative treatment,
   2. Initial plain X-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture.

C. For stress reaction, advanced imaging is not medically necessary for surveillance for “return to play” decisions of regarding a stress reaction identified on an initial imaging study.

D. For stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study. Any additional requests will be forwarded for Medical Director review.

   1. Tc-99m bone scan whole body (CPT® 78306) with SPECT of the area of interest (CPT® 78320) is indicated for suspected fractures if MRI cannot be performed.

IV. Suspected or known avascular necrosis(osteonecrosis, OCD, AVN, and osteochondritis dissecans) with pain and recent x-ray which is either negative or non-diagnostic and one of A and MRI cannot be done]

A. Risk factors and pain [One of the following]
   1. Steroid use
   2. Sickle cell disease
   3. Excessive alcohol use
   4. Smoking
   5. HIV infection
   6. SLE
   7. Renal transplant
   8. Trauma [One of the following]
      a. Fracture
      b. Dislocation
   9. Coagulopathy
   10. Bisphosphonates
   11. Pancreatitis
   12. Gaucher’s disease

V. Myositis ossificans

A. Heterotopic calcification seen on x-ray [One of the following]
1. Recent trauma or surgery
2. Pain swelling and erythema at site

VI. Suspected frostbite

VII. Suspected child abuse

VIII. Paget’s disease [One of the following]
   A. Bone scan or MRI can be considered if the diagnosis (based on plain X-rays and laboratory studies) is in doubt
   B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected
   C. Bone scan (CPT® codes: 78300, 78305, 78306, or 78320) is indicated for evaluation of Paget’s disease

IX. Radiographically occult bone disease (A bone scan may be used for confirmation of the presence of disease)

X. Spondyloysis (SPECT 78320)

References:


78300, 78305, 78306 Nuclear Bone Scan
I. **Suspected Occult/Stress/Insufficiency Fracture/Stress Reaction**
   A. For suspected hip/femoral neck, tibia, pelvis/sacrum, tarsal navicular, proximal fifth metatarsal, or scaphoid occult/stress/insufficiency fractures, and suspected atypical femoral shaft fractures related to bisphosphonate use, MRI without contrast can be performed if the initial evaluation of history, physical exam and plain X-ray fails to establish a definitive diagnosis
   1. CT without contrast can be performed as an alternative to MRI for suspected insufficiency fractures of the pelvis/hip and suspected atypical femoral shaft fractures related to bisphosphonate
   2. Tc-99m Bone scan whole body (CPT®78306) with SPECT of the area of interest (CPT®78320) is indicated for suspected fractures if MRI cannot be performed
   3. Tc-99m Bone scan Foot (CPT®78315) is indicated for suspected occult or stress fractures of the tarsal navicular
   B. MRI or CT without contrast can be performed for all other suspected occult/stress/insufficiency fractures when either:
      1. Repeat plain X-rays remain non-diagnostic for fracture after a minimum of 10 days of provider-directed conservative treatment,
      2. Initial plain X-rays obtained a minimum of 14 days after the onset of symptoms are non-diagnostic for fracture
   C. For stress reaction, advanced imaging is not medically necessary for surveillance for “return to play” decisions of regarding a stress reaction identified on an initial imaging study
   D. For stress fracture, an MRI without contrast of the area of interest is allowed as follow-up imaging for "return to play" evaluation at least 3 months after the initial imaging study. Any additional requests will be forwarded for Medical Director review
      1. Tc-99m bone scan whole body (CPT® 78306) with SPECT of the area of interest (CPT® 78320) is indicated for suspected fractures if MRI cannot be performed

II. **Suspected or known osteomyelitis**
   A. Bone scan (CPT® 78315 or CPT® 78320) is indicated for the evaluation of suspected bone infection [One of the following]
      1. MRI cannot be done
      2. Infection is multifocal
      3. Infection is associated with orthopedic hardware
      4. Chronic bone alterations from trauma or surgery.
B. Note: Combining bone scintigraphy with a labeled leukocyte scan enhances sensitivity. A labeled leukocyte scan (radiopharmaceutical inflammatory imaging - one of CPT® codes: 78805, 78806, or 78807) in concert with Tc-99m sulfur colloid marrow imaging (one of CPT® codes: 78102, 78103, or 78104) is particularly useful in cases with altered bone marrow distribution, such as joint prosthesis.

III. Post-Operative Joint Replacement Surgery
A. Complications following joint replacement surgery include (not limited to) periprosthetic fracture, infection, aseptic loosening, failure of fixation/component malposition, and wear.

B. CT without contrast or bone scan (CPT® 78315 or CPT® 78320) may be indicated for the evaluation of suspected aseptic loosening of orthopaedic joint replacements when recent plain X-ray is nondiagnostic.
   1. CT shoulder without contrast (CPT® 73200) can be performed as additional imaging following plain X-rays regardless of plain X-ray findings.
   2. The usefulness of bone scan for the evaluation of suspected aseptic loosening of a shoulder replacement may be limited as bone remodeling–related increased uptake can be seen at the site of joint replacement for up to 1 year following surgery.

C. CT without contrast is appropriate with a high suspicion for a periprosthetic fracture and a negative plain X-ray.
   1. CT shoulder without contrast (CPT® 73200) can be performed as additional imaging following plain X-rays regardless of plain X-ray findings.

D. Joint aspiration is the initial evaluation after plain X-ray for a painful joint replacement when periprosthetic infection is suspected

IV. Myositis ossificans
A. Heterotopic calcification seen on x-ray [One of the following]
   1. History of trauma or surgery
   2. Pain, swelling, and erythema at site

V. Complex regional pain syndrome or reflex sympathetic dystrophy [All of the following]
A. Local pain and tenderness
B. Flushing or diminished blood flow
C. Skin changes
VI. Paget’s disease [One of the following]
   A. Bone scan or MRI can be considered if the diagnosis (based on plain X-rays and laboratory studies) is in doubt
   B. MRI (contrast as requested) can be considered if malignant degeneration, which occurs in up to 10% of cases, is suspected
   C. Bone scan (CPT® codes: 78300, 78305, 78306, or 78320) is indicated for evaluation of Paget’s disease

References:

A SPECT scan may be approved for any of the indications for which a bone scan can be approved. If the request is for 78300 and 78320 then only the 78320 is to be approved if medical necessity is established. If the request is for 78305 or 78306 and 78320 then you may approve 2 codes if medical necessity is established.

References:


78320 Nuclear Bone Scan SPECT
I. Calculation of left and right ventricular ejection fractions

II. Assessment of wall motion

III. Quantitation of right to left shunts
78445 Non-cardiac Vascular Flow Imaging

This is an obsolete examination. MRA, CTA, or Duplex Doppler ultrasounds.
These are obsolete examinations that have been largely superseded by vascular ultrasound, MRA, and CTA. They may be of occasional value when these newer examinations are not feasible.
78459  PET Myocardial – Metabolic
78491  PET Myocardial Perfusion Imaging, Rest or Stress
78492  PET Myocardial Perfusion Imaging, Rest and Stress

Cardiac Imaging Procedure Codes

<table>
<thead>
<tr>
<th>CARDIAC PET</th>
<th>CPT®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myocardial imaging, PET, <em>metabolic</em> evaluation</td>
<td>78459</td>
</tr>
<tr>
<td>Myocardial imaging, PET, <em>perfusion</em>; single study at rest or stress</td>
<td>78491</td>
</tr>
<tr>
<td>Myocardial imaging, PET, <em>perfusion</em>; multiple studies at rest and/or stress</td>
<td>78492</td>
</tr>
<tr>
<td>Absolute quantitation of myocardial blood flow, PET, rest and stress</td>
<td>+0482T</td>
</tr>
</tbody>
</table>

- 78491 and 78492 are also referred to as a rubidium study stress test.
- 3D rendering, (CPT® 76376/CPT® 76377), should not be billed in conjunction with PET.
- Separate codes for such related services as treadmill testing (CPT® 93015-CPT® 93018) and radiopharmaceuticals should be assigned in addition to perfusion PET. These services are paid according to each individual payor.
- 0482T is an add on code for CPT® 78491 or CPT® 78492 and is considered investigational

A. Cardiac PET – Perfusion – Indications (CPT® 78491 and CPT® 78492) Meets all of the criteria for an imaging stress test and additionally any one of the following:
   1. Individual is obese (for example BMI>35 kg/m²) or
   2. Individual has large breasts or implants
B. Equivocal nuclear perfusion (MPI) stress test
   1. Routine use in post heart transplant assessment of transplant CAD
C. CMS (Medicare) does not cover reporting for wall motion and ejection fraction performed in conjunction with cardiac perfusion PET. There is not a separate CPT® or HCPCS code associated with these specific services. eviCore and their partner health plans adhere to the CMS policy, unless explicitly stated in the health plan’s coverage policy.

II. Cardiac PET – Perfusion – Indications (CPT® 78491 and CPT® 78492)
A. Performance of quantitation of myocardial blood flow by Cardiac PET is currently non-standardized between different vendor products.
B. Absolute quantitation of myocardial blood flow (CPT® 0482T) is considered experimental, investigational and/or unproven (EIU)

III. Cardiac PET – Metabolic – Indications (CPT® 78459)
A. To determine myocardial viability when a previous study has shown significant left ventricular dysfunction when under consideration for revascularization or

B. To identify and monitor response to therapy for established or strongly suspected cardiac sarcoid. This study may be performed in conjunction with a Cardiac PET perfusion examination, single study, CPT® 78491 or MPI SPECT CPT® 78451

References


78459, 78491, 78492 PET Myocardial
These are obsolete examinations. Cardiac MRI.
A first pass or multi-gated acquisition (MUGA) scan uses a radioisotope circulating in the blood to assess ventricular function. Similar data is collected during myocardial perfusion examinations (represented by CPT codes 78478 and 78480) and can be derived from echocardiography and certain CT and MR examinations.

I. **Assessment of cardiac function for cardiotoxic chemotherapy**

   A. Prior to the initiation of cardiotoxic chemotherapy [One of the following]
      1. No echocardiogram is planned or performed
      2. Prior echocardiogram is uninterpretable

   B. Cardiac function monitoring during cardiotoxic chemotherapy. Cardiotoxic chemotherapy includes any of the following medications:
      1. 5-FU (5 fluorouracil)
      2. Adriamycin® (doxorubicin)
      3. Avastin® (bevacizumab)
      4. Bleomycin
      5. Busulfan
      6. Cerubidine® (daunorubicin)
      7. Cetuximab
      8. Cisplatin
      9. Clolar® (clofarabine)
      10. Cytoxan® (cyclophosphamide)
      11. Epirubicin (Pharmorubicin®)
      12. Erbulin
      13. Gleevec® (imatinib)
      14. Herceptin® (trastuzumab)
      15. Ifex® (ifosfamide)
      16. Mutamycin® (mitomycin)
      17. Nexavar® (sorafenib)
      18. Novantrone® (mitoxantrone)
19. Rituximab
20. Sutent® (sunitinib)
21. Taxol® (paclitaxel)
22. Taxotere® (docetaxel)
23. Tykerb® (lapatinib)
24. Valstar® (valrubicin)
25. Xeloda® (capecitabine)
26. Zavedos® (idarubicin)

II. **Assessment of cardiomyopathy**
   A. Known ejection fraction less than 50 percent on prior imaging [One of the following]
      1. Asymptomatic follow-up [Both of the following]
         a. No cardiac function imaging in the last year
         b. No planned echocardiogram
      2. Symptomatic
         a. Shortness of breath

III. **Assessment of congestive heart failure**
   A. Known ejection fraction less than 50 percent on prior imaging [One of the following]
      1. Asymptomatic follow-up [Both of the following]
         a. No cardiac function imaging in the last year
         b. No planned echocardiogram
      2. Symptomatic [One of the following]
         a. Shortness of breath
         b. Paroxysmal nocturnal dyspnea
         c. Orthopnea

References:

This series of studies represent the range of options for ventilation and perfusion lung scanning. Since there are codes that cover perfusion-only exams, ventilation-only exams and combined ventilation and perfusion exams, only one of these codes can be requested for a single date of service.

I. For suspected pulmonary embolism (PE), in general only ventilation-perfusion (also called VQ studies) should be used\(^1\)\(^-\)\(^5\)

A. Abnormal perfusion scan

References:

This series of studies represent the range of options for ventilation and perfusion lung scanning. Since there are codes that cover perfusion-only exams, ventilation-only exams, and combined ventilation and perfusion exams, only one of these codes can be requested for a single date of service. Perfusion only and ventilation only lung scans are occasionally useful, but have been largely replaced by other modalities.

In young patients with a normal chest x-ray and low probability of PE, CPT 78580 or 78582 may be certified if criteria are met.

I. For follow-up of an equivocal recent ventilation-perfusion lung scan to evaluate for interval change\textsuperscript{1-5}

II. For suspected pulmonary embolism (PE), 71275 CTA of the chest or 71260 CT of the chest with contrast should be used. If there is a contraindication to CTA of the chest, then in general only ventilation-perfusion scans (also called VQ studies), CPT 78582 should be certified.\textsuperscript{1-10}

| Suspected or known DVT with leg swelling and pain | 3.0 points |
| Diagnosis other than PE is less likely | 3.0 points |
| Tachycardia >100 | 1.5 points |
| Previous DVT or Pulmonary embolus | 1.5 points |
| Immobilization (including surgery) in the past 4 weeks | 1.5 points |
| Hemoptysis | 1.0 points |
| Personal history of cancer treated in the past 6 months or on palliative treatment | 1.0 points |

References:


https://www.icsi.org/_asset/sw0ppg/VTE.pdf.


There are a series of CPT codes covering lung scanning. In general, only ventilation-perfusion scans, also called VQ, scans should be requested.

CTA of the chest, 71275.

I. Suspected pulmonary embolus (PE) (CT with contrast or CT pulmonary arteriography are also appropriate)\textsuperscript{1-5}

A. For evaluation of suspected pulmonary embolism

1. Clinical findings
   a. Sudden onset of dyspnea
   b. Pleuritic chest pain
   c. Cough
   d. Hemoptysis
   e. Tachypnea
   f. Hypoxia
   g. Known DVT by sonography or by abdominal, pelvic or extremity CT or MRI
   h. New onset of atrial fibrillation

References:

**78597 Quantitative Differential Pulmonary Perfusion, Including Imaging When Performed**

Also known as pulmonary split crystal function study.

I. Pre-operative assessment for planned segmental, lobar or lung removal\(^1\)\(^2\)

References:

Quantitative Differential Pulmonary Perfusion and Ventilation (eg, Aerosol or Gas), Including Imaging When Performed

Also known as pulmonary split crystal function study.

I. Pre-operative assessment for planned segmental, lobar or lung removal\textsuperscript{1,2}

References:

These are obsolete studies and are rarely ordered.

These are inpatient studies ordered to confirm brain deaths for patients on life support systems whose anatomic imaging generally shows diffuse edema and brain stem herniation. Related CPT Codes would be 70551-70553 (or CT if MRI is contraindicated), 78607 (cerebral perfusion SPECT imaging (ischemia, infarction, seizure disorders, and traumatic brain injury)), and 78608 (PET Metabolic (for dementia, movement disorders, seizure disorders, or primary brain cancers))

I. 78600-78606
   A. Establish brain death

References:

SPECT scanning (with DaTscan™ [Ioflupane I-23 injection], a radiopharmaceutical indicated for striatal dopamine transporter visualization) is considered to be experimental and investigational for differentiating Parkinson’s disease from other parkinsonian syndromes.

I. Suspected Huntington’s disease
II. Immunocompromised patients with mass lesion detected on CT or MR for differentiation of lymphoma and infection

References:
Amyvid imaging for dementia is considered to be investigational and/or experimental.

Vizamyl (flutemetamol F18) imaging for Alzheimer's disease is considered investigational and/or experimental.

I. **Primary brain tumors**¹ [One of the following]
   A. PET Brain Metabolic Imaging (CPT® 78608) is only supported for use in brain tumors of specified histologies such as:
      1. Low grade gliomas
         a. Pilocytic Astrocytoma
         b. Fibrillary (or Diffuse) Astrocytoma
         c. Optic Pathway Gliomas
         d. Pilomyxoid Astrocytoma
         e. Oligodendroglioma
         f. Oligoastrocytoma
         g. Oligodendrocytoma
         h. Subependymal Giant Cell Astrocytoma (SEGA)
         i. Ganglioglioma
         j. Gangliocytoma
         k. Dysembryoplastic infantile astrocytoma (DIA)
         l. Dysembryoplastic infantile ganglioglioma (DIG)
         m. Dysembryoplastic neuroepithelial tumor (DNT)
         n. Tectal plate gliomas
         o. Cervicomedullary gliomas
         p. Pleomorphic xanthoastrocytoma (PXA)
         q. Any other glial tumor with a WHO grade of I or II
      2. High grade gliomas
         a. Anaplastic astrocytoma
         b. Glioblastoma multiforme
         c. Diffuse intrinsic pontine glioma (DIPG, or “brainstem glioma”)
         d. Gliomatosis cerebri
         e. Gliosarcoma
         f. Anaplastic oligodendroglioma
         g. Anaplastic ganglioglioma
         h. Anaplastic mixed glioma
         i. Anaplastic mixed ganglioneuronal tumors
         j. Any other glial tumor with a WHO grade of III or IV
   B. PET Brain Metabolic Imaging (CPT® 78608) is considered investigational/experimental for all other histologies including metastases to the brain
   B. PET Brain Metabolic Imaging (CPT® 78608) may be obtained for one of the following:
1. Determine need for biopsy when transformation to high grade glioma is suspected based on clinical symptoms or recent MRI findings
2. Evaluate a brain lesion of indeterminate nature when the PET findings will be used to determine whether biopsy/resection can be safely postponed
3. For High Grade glioma only - Distinguish radiation-induced tumor necrosis from progressive disease within 18 months of completing radiotherapy

II. Movement disorder (MRI)\(^3,4\) [One of the following]
   A. Suspected Huntington’s chorea with a non-diagnostic MRI and genetic testing is inconclusive [One of the following]
      1. Irregular lurching gait
      2. Speech disturbance
      3. Positive family history
   B. Progressive ataxia of undetermined etiology

III. Seizure\(^5\) (MRI) [All of the following]
   A. Seizures not responsive to adequate dosage of medications
   B. Surgery is planned
   C. MRI does not define a “seizure focus”

IV. Pediatric Epilepsy and other seizure disorders\(^6-12\) - A recent (within 60 days) face-to-face evaluation including a detailed history, physical examination with a thorough neurologic examination, and appropriate laboratory studies should be performed prior to considering advanced imaging, unless the patient is undergoing guideline-supported scheduled follow-up imaging evaluation. This clinical evaluation should also include family history and (whenever possible) the accounts of eyewitnesses to the event(s).
   A. Initial Imaging of Non-Febrile seizures
      1. MRI brain without contrast (CPT\(^\text{®}\) 70551) or without and with contrast (CPT\(^\text{®}\) 70553) is indicated for the following:
         a. First-time seizure in child ≥12 months of age that has no known cause and is not associated with fever
         b. Inconclusive findings on recent cranial ultrasound or CT Head
         c. Partial seizures
         d. Focal neurologic deficits
         e. Patients requiring sedation should generally not have noncontrast MRI studies. See Pediatric Head Imaging Modality General Considerations (noted below)
      2. CT Head without contrast (CPT\(^\text{®}\) 70450) is indicated for the following:
         a. First-time seizure in child associated with recent head trauma
         b. Patient cannot safely undergo MRI (avoidance of sedation is not an indication)
      3. Cranial ultrasound (CPT\(^\text{®}\) 76506) is indicated for the following:
a. First-time seizure in child in child <12 months of age that has no known cause and is not associated with fever if the infant has an open fontanelle.

4. The following imaging tests do not generally add valuable information initially and are not indicated for the initial evaluation of seizures in children:
   a. CTA Head or Neck
   b. MRA Head or Neck
   c. MRI Cervical, Thoracic, Lumbar Spine

B. Repeat imaging on indication
   1. Repeat MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is indicated for the following:
      a. New or worsening focal neurologic deficits
      b. Increase in severity or frequency of seizures despite documented therapeutic antiepileptic drug levels
      c. Change in seizure type
      d. Preoperative evaluation for epilepsy surgery
      e. Patients requiring sedation should generally not have noncontrast MRI studies. See Pediatric Head Imaging Modality General Considerations (noted below).

C. Evaluation for Epilepsy Surgery
   1. These cases should be forwarded for medical review
   2. PET Brain Metabolic (CPT® 78608)
   3. Functional MRI Brain (CPT® 70554 or 70555)
   4. MR Spectroscopy (CPT® 76390)
      a. NOTE: Certain payers consider MR Spectroscopy investigational/experimental, and those coverage policies take precedence over eviCore Imaging Guidelines.

D. Febrile Seizures
   1. Neuroimaging should not be performed in the routine evaluation of children with simple febrile seizures

V. Pediatric Head Imaging Modality General Considerations³,¹³-³²

A. MRI
   1. MRI is the preferred modality for imaging the pediatric head unless otherwise stated in a specific guideline section
   2. Due to the length of time for image acquisition and the need for the patient to lie still, anesthesia is required for almost all infants and young children (age <7 years), as well as older children with delays in development or maturity. In this patient population, MRI imaging sessions should be planned with a goal of minimizing anesthesia exposure adhering to the following considerations:
      a. MRI should always be performed without and with contrast unless there is a specific contraindication to gadolinium use, since the patient already has intravenous access for anesthesia
i. Recent evidence based literature demonstrates the potential for gadolinium deposition in various organs including the brain, after the use of MRI contrast.

ii. The U.S. Food and Drug Administration (FDA) has noted that there is currently no evidence to suggest that gadolinium retention in the brain is harmful and restricting gadolinium-based contrast agents (GBCAs) use is not warranted at this time. It has been recommended that GBCA use should be limited to circumstances in which additional information provided by the contrast agent is necessary and the necessity of repetitive MRIs with GBCAs should be assessed.

iii. If requesting clinicians indicate that a non-contrast study is being requested with specific concern for gadolinium retention, the exam can be approved.

b. If multiple body areas are supported by MSI guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same anesthesia session

B. CT

1. CT is generally inferior to MRI for imaging the pediatric head, but has specific indications in which it is the preferred modality listed in specific sections of these guidelines
   a. CT should not be used to replace MRI in an attempt to avoid sedation unless listed as a recommended study in a specific guideline section

C. Ultrasound

1. Cranial ultrasound (CPT® 76506) is a non-invasive means of evaluating for intracranial abnormalities in infants with an open anterior fontanelle
2. Transcranial Doppler ultrasonography has some utility in select populations of older children with known or suspected intracranial vascular disease

D. Nuclear Medicine

1. Nuclear medicine studies other than metabolic PET imaging on the pediatric brain or head are rarely performed in an elective outpatient setting, but the following studies can be approved when requested for the following indications:
   a. Brain Scintigraphy with or without vascular flow (any one of CPT®78600, CPT®78601, CPT®78605, or CPT®78606)
      i. Establish brain death (rarely done in outpatient setting)
   b. Brain Imaging SPECT with Ioflupane I-23 (CPT® 78607)
      i. Immunocompromised patients with mass lesion detected on CT or MRI for differentiation between lymphoma and infection
   c. Brain Imaging Vascular Flow (CPT® 78610)
      i. Cerebral ischemia
      ii. Establish brain death
   d. CSF Leakage Detection (CPT® 78650)
      i. Evaluation of CSF rhinorrhea or otorrhea, or refractory post-lumbar puncture headache
e. Radiopharmaceutical Dacryocystography (CPT® 78660)
   i. Suspected obstruction of nasolacrimal duct due to excessive tearing

References:

2. Decision memo for positron emission tomography (FDG) for solid tumors (CAG-00181R4).
24. New York State Department of Health, Guidelines for Determining Brain Death, December 2011,
death scintigraphy, Version 1.0, Approved February 25, 2003, available at
27. Thrall JH, and Zeissman HA, Nuclear Medicine, The requisites, Mosby 2001; 312-313.
http://tech.snmjournals.org/content/37/1/1.full.
34. FDA Drug Safety Communication: FDA identifies no harmful effects to date with brain retention of
gadolinium-based contrast agents for MRIs; review to continue. FDA Drug Safety Communication.
78609  Brain PET Perfusion

I.  Chronic internal carotid artery occlusion prior to surgical intervention

II. Moyamoya disease
I. Cerebral ischemia¹
II. Establish brain death

Reference:

1. Thrall JH, Zeissman HA, Nuclear Medicine, the Requisites, Mosby, 2001, 312-313.
I. Evaluation of normal pressure hydrocephalus vs. obstructive hydrocephalus\textsuperscript{1,2} [Certify 78630 for A & B]

A. Suspected obstructive hydrocephalus
B. Suspected normal pressure hydrocephalus with gait disturbance and one of the following
   1. Dementia
   2. Urinary incontinence

II. Known hydrocephalus with worsening symptoms (certify 78630)

III. Evaluation of internal shunt, porencephalic cyst, or posterior fossa cyst (certify 78635 or 78647)

IV. Patient with a shunt (ventriculo-peritoneal, ventricular-pleural or ventricular venous) that may be blocked\textsuperscript{3} [Certify 78645]

References:

78650 CSF Leakage Detection

I. CSF rhinorrhea
II. CSF otorrhea
III. Post lumbar puncture headache
I. **Clinical suspicion of obstruction of nasolacrimal duct**\(^1-3\)
   A. Excessive tearing

References:

There are two ways of imaging DMSA or Glucoheptonate which generally is intended to document distribution of perfused healthy renal tissue. Mostly pediatric patients with prior pyelonephritis causing scarring, or known ureteral reflux that could lead to pyelonephritis and scarring. Occasionally used for ischemic or potentially traumatic renal injury.

I. Evaluation of suspected horseshoe kidney

II. Known pyelonephritis to detect cortical scarring

III. Urinary tract infection in a child with poor response to 48 hours of antibiotics with urinary retention, elevated creatinine, or recurrent febrile urinary tract infections

IV. Acute pyelonephritis with bacteriuria for children age 2 months to 3 years may be performed 4-6 months after the infection to detect scarring

V. Evaluation of suspected solitary or ectopic (e.g. pelvic kidney) renal tissue

References:

I. Renal transplant follow-up per protocol

II. Kidney salvage versus nephrectomy

III. Evaluation of suspected horseshoe kidney

IV. Acute pyelonephritis as a second line test to detect renal cortical scarring

V. Evaluation of suspected solitary or ectopic (e.g., pelvic kidney) renal tissue

VI. Evaluation of acute renal failure with no evidence of obstruction on recent ultrasound

VII. Evaluation of chronic renal failure
   A. Assessment of global and differential renal function to estimate prognosis for recovery

References:

Note: For kidney flow studies, use 78707.

I. Renal transplant follow-up per protocol

II. Kidney salvage versus nephrectomy

III. Recurrent flank pain with normal IVP
   A. CT and US non-diagnostic

IV. Evaluation of suspected horseshoe kidney¹

V. Acute pyelonephritis history of urinary tract infection in child 2 months to 3 years 4-6 months ago¹

References:

I. Renovascular hypertension, suspected renal artery stenosis (MRA)\textsuperscript{1-4} [One of the following]
   A. Severe hypertension (>110 diastolic) with [One of the following]
      1. Progressive renal insufficiency
      2. Refractoriness to aggressive medical therapy (usually failure to respond to 3 drug therapy)
   B. Malignant or accelerated hypertension
   C. Acute worsening of previously stable hypertension
   D. Hypertension (diastolic> 100) in adult <35 years old
   E. New onset significant hypertension (>110 diastolic) after age 50
   F. Hypertension in a patient with [One of the following]
      1. Diffuse atherosclerosis or
      2. Incidentally detected asymmetry of kidney size
   G. Hypertension with an acute elevation in plasma creatinine concentration unexplained or after therapy with an ACE inhibitor
   H. Abdominal bruit
   I. Recurring acute pulmonary edema with significant hypertension)
   J. Hypokalemia (<3.5 mmol/L) with normal or elevated plasma renin (>1 ng/ml/Hr) levels in the absence of diuretic therapy
   K. Children with hypertension [MRA]
   L. Hypertension and documented neurofibromatosis

II. Kidney salvage versus nephrectomy\textsuperscript{3}

III. Recurrent flank pain\textsuperscript{3,5,6}
   A. CT and US non-diagnostic, or allergy to iodinated contrast agent

IV. Suspected obstructive uropathy\textsuperscript{3,5,6} (78708 or 78709 renal scan with pharmacologic intervention)

V. Evaluation of acute renal failure with no evidence of obstruction on recent ultrasound\textsuperscript{3,5}

VI. Evaluation of chronic renal failure\textsuperscript{3,6}
   A. Assessment of global and differential renal function to estimate prognosis for recovery

VII. Follow up of renal transplant
References:


   February 8, 2012.


78707 Kidney Flow and Function, Single Study without Pharmacologic Intervention
I. Renovascular hypertension, suspected renal artery stenosis\textsuperscript{1-4} 
[One of the following] 
A. Severe hypertension (>110 diastolic) with [One of the following] 
   1. Progressive renal insufficiency 
   2. Refractoriness to aggressive medical therapy (usually failure to respond to 3 drug therapy) 
B. Malignant or accelerated hypertension 
C. Acute worsening of previously stable hypertension 
D. Hypertension (diastolic > 100) in adult <35 years old 
E. New onset significant hypertension (>110 diastolic) after age 50 
F. Hypertension in a patient with [One of the following] 
   1. Diffuse atherosclerosis or 
   2. Incidentally detected asymmetry of kidney size 
G. Hypertension with an acute elevation in plasma creatinine concentration unexplained or after therapy with an ACE inhibitor 
H. Abdominal bruit 
I. Recurring acute pulmonary edema with significant hypertension) 
J. Hypokalemia (<3.5 mmol/L) with normal or elevated plasma renin (>1 ng/ml/Hr) levels in the absence of diuretic therapy 
K. Children with hypertension (MRA) 
L. Hypertension and documented neurofibromatosis

II. Determination of renal plasma flow and/or glomerular filtration rate and differential renal function\textsuperscript{2}

III. Recurrent flank pain\textsuperscript{3} 
A. CT and US non-diagnostic, or allergy to iodinated contrast agent

IV. Suspected obstructive uropathy\textsuperscript{3,5} (Diuretic-enhanced studies included here) 
A. Prior imaging (CT or US) suggesting obstruction

V. Acute renal failure with no evidence of obstruction on recent ultrasound\textsuperscript{5}

VI. Evaluation of chronic renal failure\textsuperscript{5} 
A. Assessment of global and differential renal function to estimate prognosis
VII. Follow up of renal transplant

References:

I. Known pyelonephritis to detect cortical scarring\textsuperscript{1,2}

II. Urinary tract infection in a child with poor response to 48 hours of antibiotics with urinary retention, elevated creatinine or recurrent febrile urinary tract infections\textsuperscript{1}

References:


78740 Ureteral Reflux Study (Radiopharmaceutical Voiding Cystogram)

This study is almost exclusively performed in children.

I. **Suspected vesicoureteral reflux**\(^1-5\) [One of the following]
   A. Clinical evidence of recurrent urinary tract infections
   B. Known reflux

II. **Antenatal renal pelvis measuring 5 mm (hydronephrosis) or more**

III. **Clinical evidence of recurrent urinary tract infections**

IV. **Known reflux**\(^1-4\)
   A. Repeat between 12-24 months of initial diagnosis

V. **Sibling with proven ureteral reflux**\(^2,3\)
   A. History of urinary tract infection with no prior testing for reflux
   B. Renal scarring on ultrasound

References:

78761 Testicular Scan – Vascular Flow and Delayed Images

I. Scrotal pain\(^{1-3}\) [Both of the following]
   A. Suspected testicular torsion
   B. Non-diagnostic evaluation with Doppler inadequate or not available

References:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>78800</td>
<td>Radiopharmaceutical Localization of Tumor Limited Area</td>
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<tr>
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<td>Radiopharmaceutical Localization of Tumor Multiple Areas</td>
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<td>78802</td>
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BSGI or breast-specific gamma imaging is considered to be investigational and/or experimental.

If this is for radioembolization of the liver see CPT code 78201-78216.

I. **Octreoscan**\(^{1-3}\) [One of the following for initial evaluation] (not recommended for routine surveillance)
   
   A. Neuroendocrine tumors of thymus, bronchopulmonary, stomach (may have elevated or normal gastrin levels), small bowel, appendix, or pancreas for initial staging and evaluation of unresectable or metastatic disease
   
   B. Medullary thyroid carcinoma (Patient must have an established diagnosis)
   
   C. Carcinoid tumors [One of the following] for initial staging
      1. Elevated urine 5HIAA >15mg/24hr
      2. Elevated chromogranin A (CgA) >39ng/L
      3. Elevated substance P >270 ng/L or pg/mL
      4. Elevated serotonin >330mcmol/L
   
   D. Gastrinoma
      1. Elevated serum gastrin >100 pg/mL
   
   E. Insulinoma
      1. Elevated serum insulin >2.0ng/mg
   
   F. Glucagonoma
      1. Elevated serum glucagon >100pg/mL
   
   G. VIPoma
      1. Elevated vasoactive intestinal polypeptide (VIP) >75pg/mL
   
   H. Somatostatinoma
      1. Elevated somatostatin
   
   I. Pheochromocytoma
      1. Elevated VMA or metanephrine >7mg/24hr
      2. Elevated blood catecholamines
         a. Epinephrine >20ng/mL
         b. Norepinephrine >60ng/mL
   
   J. Merkel cell tumor of the skin
II. Proctascincit® scan [One of the following]
Before proctascinct® scan may be certified the patient must have the following imaging studies: chest x-ray, bone scan, and CT or MRI scan abdomen and pelvis
A. Patients with a history of prostate carcinoma treated with a radical prostatectomy
   1. The patient must have a rising PSA. A rising PSA means an increase in the PSA level on two or more consecutive tests after the first or reference test. The levels can be <10.
B. Patients with a history of prostate carcinoma treated with radiation or seed implantation, etc., but without prostatectomy, must have a rising PSA.

III. Gallium scan [One of the following]
A. Lymphoma and Hodgkin’s disease
   1. No PET scan within 2 months
B. Sarcoïd
C. Suspected inflammatory reaction
D. Sarcoma (PET)
E. Melanoma (PET)
F. Multiple myeloma (PET)
G. Head and neck tumors (PET)

IV. Zevalin® chemotherapy

V. MIBG I (123 or 131) scan [One of the following]
A. Neuroblastoma [One of the following]
   1. Initial staging
   2. Response to treatment with stage IV
   3. Before and after surgery of the primary tumor
   4. New onset of bone pain
   5. Planning MIBG therapy
B. Pheochromocytoma [One of the following]
   1. Initial staging
   2. Before and after surgery of the primary tumor
   3. Suspicion of relapse (rising catecholamines or VMA)
C. Ganglioneuroma [One of the following]
   1. Initial staging
   2. Before and after surgery of the primary tumor
   3. Suspicion of relapse
D. Merkel cell tumor [One of the following]
   1. Initial staging
   2. Suspected relapse
E. Medullary thyroid carcinomas
References:


I. Osteomyelitis¹ - Bone scan (CPT®78315 or CPT®78320) is indicated for the evaluation of suspected bone infection [One of the following]
   A. MRI cannot be done
   B. Infection is multifocal
   C. Infection is associated with orthopedic hardware
   D. Chronic bone alterations from trauma or surgery

General statement:

Combining bone scintigraphy with a labeled leukocyte scan enhances sensitivity. A labeled leukocyte scan (radiopharmaceutical inflammatory imaging - one of CPT® codes: 78805, 78806, or 78807) in concert with Tc-99m sulfur colloid marrow imaging (one of CPT® codes: 78102, 78103, or 78104) is particularly useful in cases with altered bone marrow distribution, such as joint prosthesis.

In the presence of orthopedic hardware or prosthesis, normal bone marrow is disrupted and displaced, making interpretations difficult in these regions. Comparison of ¹¹¹In-leukocyte localization with ⁹⁹mTc-sulfur colloid uptake using combined or sequential ¹¹¹In-leukocyte/⁹⁹mTc colloid images is often necessary. Comparison with adjacent or contralateral regions can also be helpful.

A white-cell scan should be accompanied by a bone marrow scan using Tc 99m sulfur colloid performed either together or sequentially. ¹¹¹In-leukocyte uptake is typically increased in the vicinity of infected orthopedic hardware and normal or loose but non-infected prosthesis. Infection is likely when there is abnormal ¹¹¹In-leukocyte localization without corresponding ⁹⁹mTc-sulfur colloid bone marrow activity (discordant activity).

II. Cellulitis [All of the following]
   A. Local pain
   B. Erythema
   C. Swelling
   D. Heat

III. Peritonitis
IV. Inflammatory granulomatous process
   A. Tuberculosis
   B. Sarcoidosis

V. Pulmonary infection and inflammatory disease

VI. Pneumonia

VII. Drug-induced pulmonary reactions or toxicity
   A. Cytoxan®
   B. Busulfan
   C. Bleomycin
   D. Amiodarone
   E. Nitrofurantoin

VIII. Urinary tract infections
   A. Pyelonephritis
   B. Diffuse interstitial nephritis

IX. Fever of unknown origin (FUO)

X. Postoperative fever with no localizing signs or symptoms

XI. Detection of mycotic aneurysms, vascular graft infections and shunt infections

XII. Infected central venous catheters or other indwelling devices

References:


CPT CODES:

Whole body PET or PET/CT may be indicated for evaluation of melanoma, myeloma and primary bone or soft tissue sarcomas below the knee. If either CPT® codes 78813 or 78816 are requested for any other indications, the physician should be redirected to CPT® codes 78812 or 78815.

RADIOTRACERS:

Unless specified otherwise, the term “PET” refers to $^{18}$F-FDG-PET and PET/CT fusion studies.

$^{68}$Gallium DOTATATE (NETSPOT®) PET/CT scan may be beneficial in selected situations in low grade neuroendocrine tumors (details below in XVI)

$^{11}$C Choline PET/CT scan may be beneficial to detect biochemical relapse in previously treated prostate cancer if other imaging studies are negative (details below in XXIV).

$^{18}$F-Fluciclovine (AXUMIN®) PET scan is considered investigational and/or experimental in prostate cancer.

$^{18}$Na Fluoride PET scan (PET Bone scan) is considered to be experimental and/or investigational.

PET/CT imaging using any isotopes other than those listed above is considered experimental and/or investigational.

Positron emission mammography (PEM, generally reported with CPT® 78811) is considered experimental and/or investigational.
I.  GENERAL STATEMENTS:

A. PET or PET/CT scan is generally not indicated for:
   1. Infection, inflammation, trauma, post-operative healing, granulomatous disease, rheumatological conditions
   2. Concomitantly with separate diagnostic CT studies
   3. If distant or diffuse metastatic disease is clearly documented on conventional imaging studies (CT, MRI or nuclear medicine)
   4. Metastatic disease in the central nervous system (CNS)
   5. Lesions less than 8 mm in size
   6. Follow up after localized therapy (i.e. radiofrequency ablation, embolization, stereotactic radiation, etc.)
   7. Certain histologies like salivary gland, hepatocellular, kidney, uterus, vagina, vulva, basal or squamous cell skin cancers, nonseminomatous germ cell tumors, sex-cord stromal tumors, Kaposi’s sarcoma, retinoblastoma, acute or chronic leukemias, or adrenocortical carcinoma, due to lack of evidence supporting the use of PET in these cancers
   8. Rare malignancies, due to lack of available evidence regarding the diagnostic accuracy of PET in rare cancers
   9. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
   10. Serial monitoring of FDG avidity until resolution. PET/CT avidity in a residual mass at the end of planned therapy is not an indication for PET/CT imaging during surveillance.
   11. Residual mass that has not changed in size since the last conventional imaging does not justify PET imaging

B. PET scan may be indicated if:
   1. Clinical concern for persistent/recurrent disease is present AND recent conventional imaging studies (CT scan, MRI scan or bone scan) are inconclusive or negative
   2. PET/CT may be considered prior to biopsy in order to determine a more favorable site for biopsy when a prior biopsy was nondiagnostic or a relatively inaccessible site is contemplated which would require invasive surgical intervention for biopsy attempt
   3. The patient is undergoing salvage treatment for a recurrent solid tumor with residual measurable disease on conventional imaging and confirmed repeat negative PET imaging will allow the patient to transition from active treatment to surveillance.
   4. Delay PET/CT for at least 12 weeks after completion of radiation treatment, unless required sooner for imminent surgical resection.
II. **Breast carcinoma**

A. Initial staging for stage IIIA or higher breast cancer when conventional imaging is equivocal

B. Restaging during chemotherapy in a member with known metastases, if conventional imaging is equivocal or inconclusive

C. Restaging during treatment of breast cancer with bone-only metastases when there is no prior bone scan done for comparison

D. PET may NOT be indicated in breast cancer for:
   1. Establishing the diagnosis of breast cancer or to detect the primary lesion
   2. Non-invasive or in-situ breast conditions
   3. Staging of clinical stage I or IIA-B breast cancer
   4. To evaluate response to neoadjuvant chemotherapy or after surgery
   5. Clarifying a finding on mammography, physical examination, MRI or ultrasound
   6. Evaluating axillary lymph nodes
   7. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
   8. Prior to lymph node sampling in a patient with clinical stage I, II, or operable IIIA disease
   9. Obvious multi-organ metastatic disease is present on CT or MRI

III. **Thyroid carcinoma**

A. Initial staging and Restaging of Follicular, Papillary or Hürthle cell thyroid cancer when BOTH, nuclear imaging (I^{131} scan and/ or thallium^{201} scans) AND conventional imaging (CT or MRI of symptomatic body area) are negative or inconclusive and [One of the following]
   1. Thyroglobulin level detectable on hormone replacement therapy or
   2. Thyroglobulin 2ng/mL after Thyrogen® stimulation

B. Suspected recurrence with [One of the following]
   1. Negative I^{131} or Th^{201} scan or
   2. Stimulated thyroglobulin >2 ng/mL

C. Initial staging of anaplastic or medullary thyroid cancer if conventional imaging is inconclusive

D. PET may NOT be indicated in thyroid cancer for:
   1. Routinely prior to thyroidectomy
   2. Surveillance in stable asymptomatic individual without signs, symptoms or laboratory abnormalities

E. Squamous cell Head and Neck cancers Initial staging of patient with pathologically documented primary head and neck cancer stage III-IV

F. Initial staging of patient with any stage Nasopharyngeal cancer

G. Evaluation of patient with metastatic cervical lymph node(s) when CT or MRI of the neck and chest have failed to establish primary site

H. To guide laryngoscopic examination under anesthesia and biopsy, when primary site is not clinically accessible

I. Evaluation of inconclusive findings on conventional imaging (CT/MRI) Restaging after completion of primary chemoradiation of ONE of the following applies:
1. PET/CT is indicated to evaluate the need for salvage surgery/radical neck dissection in patients with measurable residual disease seen on physical exam or on recent CT/MRI (PET should be performed no sooner than 12 weeks post completion of XRT)

2. PET/CT is indicated to distinguish active tumor from radiation fibrosis if recent CT/MRI is inconclusive

J. Restaging a patient with biopsy proven local recurrence

K. PET may NOT be indicated in head and neck cancers for:
   1. Assessing response to neoadjuvant chemotherapy
   2. Assessing response after radiation therapy alone
   3. Assessing residual disease after surgery alone
   4. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

IV. Salivary Gland Cancers\(^{11}\)
   A. Only to evaluate suspicious lung nodules (see VIII below).

V. Melanoma\(^{15-17}\)
   A. Initial staging of biopsy-proven melanoma and ONE of the following:
      1. Stage III (sentinel node positive, palpable regional nodes)
      2. Stage IV (biopsy proven distant or in-transit metastases)
      3. Mucosal primary (including lip)
      4. Ocular or orbital primary
      5. Melanoma from an unknown primary and CT chest, abdomen and pelvis fail to demonstrate primary site
   B. Restaging when recurrence is clinically suspected or biopsy proven AND CT scan chest, abdomen and pelvis are inconclusive.
   C. Restaging for documented recurrence that is isolated based on conventional imaging and definitive therapy for metastatic site planned
   D. PET is not indicated in Melanoma for:
      1. In addition to diagnostic CT scans
      2. Prior to lymph node sampling
      3. For in-situ or clinical stage I/II (node negative) melanoma
      4. For monitoring response to therapy unless conventional imaging is inconclusive
      5. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
VI. **Non-Melanoma Skin Cancer**\(^{18-20}\)
   A. Initial staging of Merkel Cell Carcinoma when no metastatic disease is identified on conventional imaging
   B. Restaging for suspected recurrence of Merkel Cell Carcinoma, when conventional imaging is inconclusive or negative for metastases
   C. PET is not indicated in Non-Melanoma skin cancers for:
      1. Basal cell, squamous cell and any histology other than listed above
      2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

VII. **Solitary pulmonary nodule by CT**\(^{21-22}\)
    Multiple nodules are not covered by these criteria unless one is significantly larger than the others. Such a lesion should be treated as a solitary nodule
    A. Solid nodule \(\geq 8\text{mm}\)
       1. If Negative: Repeat CT Chest with contrast (CPT®71260) or CT Chest without contrast (CPT®71250) at 6 months and repeat at 24 months from the first CT Chest
       2. If Positive: Qualifies as initial staging PET/CT
       3. If Inconclusive: Repeat CT scan or biopsy. PET/CT may not be repeated

VIII. **Lung carcinoma**\(^{23-28}\)

    **NON-SMALL CELL LUNG CANCER**
    A. Initial staging of NSCLC, stages I-IIIB and stage IV with disease limited to the chest region (such as pleura, pericardium or lung nodules) based on conventional imaging
    B. Restaging for suspected or biopsy proven recurrence localized to the chest cavity based on conventional imaging
    C. Evaluation of inconclusive findings on conventional imaging
    D. PET is not indicated in NSCLC for:
       1. Known metastatic disease outside of the chest cavity
       2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

    **SMALL CELL LUNG CANCER**
    A. Initial staging of SCLC if limited stage is suspected based on conventional imaging
    B. Evaluation of inconclusive findings on conventional imaging
    C. PET-CT scan is not indicated in SCLC for:
       1. Evaluation of response to chemotherapy or chemoradiation
       2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
IX. **Thoracic Tumors – Mesothelioma and Thymoma**

A. Initial staging if conventional imaging shows no evidence of metastatic disease

B. Following induction chemotherapy prior to surgical resection, if conventional imaging is obtained first and shows no evidence of metastatic disease

C. For evaluation of inconclusive findings on conventional imaging

D. PET is not indicated in Thoracic tumors for:
   1. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

X. **Esophageal and Gastroesophageal junction carcinoma**

A. Initial staging of known esophageal and GE junction cancer if no evidence of metastatic disease on standard imaging

B. Restaging after chemoradiation and ONE of the following:
   1. Conventional imaging is inconclusive
   2. Patient is surgical salvage candidate for recurrence and no metastatic disease is noted on conventional imaging

C. PET-CT scan is not indicated in Esophageal cancer for:
   1. Monitoring response to chemotherapy and/or radiation prior to CT scans
   2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XI. **Gastric carcinoma**

A. Initial staging of T2 or greater gastric cancer when there is no evidence of metastatic disease on conventional imaging (CT or MRI)

B. Restaging after completion of chemotherapy or chemoradiation IF conventional imaging is inconclusive

C. PET-CT scan is not indicated in Gastric cancer for:
   1. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XII. **Pancreatic Cancer**

A. Initial staging of pancreatic cancer when there is no evidence of metastatic disease on conventional imaging (CT or MRI)

B. Restaging after completion of chemoradiation or chemotherapy if conventional imaging is inconclusive

C. PET-CT scan is not indicated in Pancreatic cancer for:
   1. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
XIII. Hepatocellular and Hepatobiliary Cancer

A. PET/CT scan is not indicated for diagnosis or staging of Hepatocellular carcinoma
B. Initial staging of primary biliary carcinoma when there is no evidence of metastatic disease on conventional imaging (CT or MRI)
C. Restaging if conventional imaging is inconclusive
D. PET-CT scan is not indicated in Hepatobiliary cancer for:
   1. Hepatocellular carcinoma
   2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XIV. Colorectal and Anal carcinoma

COLON and RECTAL CANCER

A. Initial staging of newly diagnosed colon/rectal cancer with ONE of the following:
   1. Isolated metastatic lesion noted on conventional imaging and patient is a candidate for aggressive surgical resection or local treatment of metastases with a curative intent
   2. Inconclusive conventional imaging (CT and/or MRI)

B. Evaluation of suspected recurrence when CEA/LFTs are rising and conventional imaging is negative

C. Differentiate local tumor recurrence from post-operative or post-radiation scarring

D. PET-CT scan is not indicated in Colon and Rectal Cancer for:
   1. Clearly unresectable metastatic disease
   2. Monitor response to chemotherapy or chemoradiation
   3. Monitoring liver lesions that are treated with local therapy such as chemoembolization, radiofrequency or microwave ablation, etc.
   4. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

ANAL CANCER

E. Initial staging of cancer of the Anal canal (not Anal margin, Bowen’s disease or Paget’s disease) that is stage II or greater (T3-4, N0 or anyT, N+)

F. Restaging for suspected recurrence, when conventional imaging is negative or inconclusive.

G. PET-CT scan is not indicated in Anal Cancer for:
   1. Anal margin cancer, Bowen’s disease or Paget’s disease
   2. Monitor response to chemotherapy or chemoradiation
   3. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
XV. Neuroendocrine carcinoma (low-grade, well-differentiated neuroendocrine tumors arising from lung, gastrointestinal, pancreatic or adrenal sites)\textsuperscript{56-60}

\textbf{\textsuperscript{68}Gallium DOTATATE PET scan}

Either \textsuperscript{68}Gallium DOTATATE PET scan or Octreotide\textsuperscript{®} scan (CPT\textsuperscript{®} 78800, 78801, 78802, 78803, or 78804) may be used for indications listed below, NOT BOTH.

A. When diagnosis is strongly suspected based on symptoms or elevated of tumor markers AND CT scans are negative or inconclusive

B. Initial staging of biopsy-proven neuroendocrine cancer AFTER CT scans are obtained first and are found to be inconclusive

C. Restaging for suspected recurrence based on symptoms or elevated tumor markers AND conventional imaging with CT scan is negative or inconclusive

D. \textsuperscript{68}Gallium DOTATATE PET-CT scan is not indicated in Neuroendocrine cancer for:
   1. High-grade neuroendocrine tumors
   2. Prior to conventional imaging (CT scans)
   3. Monitoring response to treatment
   4. Surveillance of an asymptomatic individual having no new signs or symptoms concerning for recurrence

\textbf{\textsuperscript{18}F-FDG PET scan}

E. Restaging for suspected recurrence based on symptoms or elevated tumor markers AND BOTH CT scans and Somatostatin-receptor based study (Octreotide\textsuperscript{®} Scan or \textsuperscript{68}Gallium DOTATATE PET scan) are negative or inconclusive

F. \textsuperscript{18}F-FDG PET PET-CT scan is not indicated in Neuroendocrine cancer for:
   1. Prior to conventional imaging (CT scans)
   2. Monitoring response to treatment
   3. Surveillance of an asymptomatic individual having no new signs or symptoms concerning for recurrence

XVI. Soft tissue sarcoma (extremity, head/neck, abdominopelvic, retroperitoneal and gastrointestinal stromal tumors)\textsuperscript{61-66}

A. Initial staging of soft tissue sarcoma with ONE of the following:
   1. When the grade of tumor is in doubt after biopsy
   2. When conventional imaging suggests solitary metastasis that is amenable to surgical resection
   3. For planning neoadjuvant therapy prior to surgical resection of tumors >3 cm on conventional imaging
   4. If conventional imaging is equivocal or inconclusive

B. Restaging of soft tissue sarcoma and ONE of the following:
   1. To differentiate tumor from radiation or surgical fibrosis
   2. To determine response to neoadjuvant therapy
   3. To confirm oligometastatic disease prior to surgical resection with curative intent
4. To clarify inconclusive findings on conventional imaging
C. PET is not indicated in Soft tissue sarcoma for:
   1. Surveillance of an asymptomatic individual not on treatment and having no
      new signs or symptoms concerning for recurrence

XVII. Primary Bone Tumors$^{67-68}$
A. Ewing's sarcoma
   1. Initial staging
   2. Monitoring response to chemotherapy (every 2 cycles) for patients with
doctorated bony metastases on pre-treatment PET scan
   3. Restaging after completion of chemotherapy
B. Osteogenic sarcoma or osteosarcoma
   1. Initial staging
   2. Monitoring response to chemotherapy (every 2 cycles) for patients with
doctorated bony metastases on pre-treatment PET scan
   3. Restaging after completion of chemotherapy
C. Chordoma
   1. Initial staging if inconclusive findings are noted on conventional imaging
   2. Restaging if inconclusive findings are noted on conventional imaging
D. PET is not indicated in Bone tumors for:
   1. Benign bone tumors such as osteochondroma, chondroblastoma,
desmoplastic fibroma, osteoid osteoma, enchondroma and giant cell
tumors of the bone
   2. Surveillance of an asymptomatic individual not on treatment and having no
new signs or symptoms concerning for recurrence

XVIII. Lymphoma: Hodgkin’s and Non-Hodgkin’s lymphoma$^{69-81}$
A. Suspected diagnosis:
   1. PET/CT scan is rarely indicated prior to histological confirmation of
lymphoma, unless used to determine a more favorable site for biopsy
when a relatively inaccessible site is contemplated
B. Initial staging (usually after tissue diagnosis is established) in addition to
standard imaging for ONE of the following:
   1. Hodgkin’s lymphoma
   2. Diffuse Large B cell lymphoma
   3. Burkitt’s lymphoma
   4. High grade (grade III) follicular lymphoma
   5. Primary Cutaneous B and T cell lymphomas
   6. Peripheral T cell lymphomas
   7. Other lymphomas when Radiation therapy is being considered as primary
treatment for stage I or II:
      a. Low grade (grade I and II) follicular lymphoma
      b. Mantle cell lymphoma
      c. Marginal zone and Mucosa-associated (MALT) lymphoma
C. Restaging during chemotherapy for ONE of the following:
   1. Hodgkin’s lymphoma
   2. If conventional imaging with CT scans is equivocal
D. End of treatment evaluation (establish new baseline) after completion of chemotherapy and/or radiation therapy (after 12 weeks of completion of radiation therapy)

E. Suspected Richter’s transformation from a low grade lymphoma to a more aggressive type when any one of the following is present:
   1. New B symptoms
   2. Rapidly growing lymph nodes
   3. Extranodal disease develops
   4. Significant recent rise in LDH above the normal range

F. PET-CT scan is not indicated in Lymphomas for:
   1. Initial staging of low grade lymphomas
   2. Evaluation of chronic lymphocytic leukemia/small lymphocytic lymphoma unless Richter’s transformation is suspected
   3. Serial monitoring of resolution of FDG activity noted on post-treatment scan
   4. Evaluation of suspected lymphoma prior to biopsy and conventional imaging, unless a relatively inaccessible site is being contemplated
   5. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
   6. Post-transplant surveillance once the PET scan is negative

XIX. Cervical carcinoma
   A. Initial staging of cervical cancer that is Stage IB2 or higher
   B. Restaging after completion of primary radiation with/without chemotherapy if the patient is a surgical salvage candidate
   C. Restaging for suspected recurrence and conventional imaging is inconclusive
   D. PET-CT scan is not indicated in Cervical cancer for:
      1. Staging of Stage IB1 or less, unless conventional imaging is inconclusive
      2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XX. Ovarian Epithelial and Primary Peritoneal carcinoma
   A. Suspected diagnosis of ovarian cancer when tumor markers are elevated with negative or inconclusive conventional imaging
   B. Primary peritoneal disease with biopsy proven ovarian malignancy
   C. Restaging for suspected recurrence when tumor markers are elevated and conventional imaging is negative or inconclusive
   D. PET-CT scan is not indicated in Ovarian cancer for:
      1. Non-epithelial ovarian cancers – germ cell tumors, sex cord stromal (granulosa cell) tumors and ovarian tumors of low malignant potential
      2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XXI. Testicular carcinoma (Seminoma)
   A. Pure Seminoma after primary treatment and ONE of the following:
      1. Residual mass on CT which is > 3 cm with normal tumor markers (Wait 6 weeks after completion of chemotherapy)
2. Suspected recurrence with rising tumor markers and negative or inconclusive conventional imaging

B. PET is not indicated in Testicular carcinoma for:
   1. Non-seminomatous germ cell tumors, sex cord stromal tumors (Sertoli-Leydig cell tumors)
   2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XXII. Transitional Cell cancer of the Bladder\textsuperscript{97-101}

A. Initial staging of transitional cell bladder cancer when there is no evidence of metastatic disease on conventional imaging (CT or MRI)

B. PET-CT scan is not indicated in Bladder cancer for:
   1. Monitoring response to treatment or for suspected recurrence
   2. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XXIII. Prostate Cancer\textsuperscript{102-104}

\textsuperscript{11}C Choline PET/CT scan

A. Restaging for suspected recurrence in a patient when ALL of the following criteria are met:
   1. Prior treatment with prostatectomy and/or radiation therapy
   2. Rising PSA on 2 consecutive occasions
   3. Recent conventional imaging (CT, MRI and Bone scan) are negative for metastatic disease

B. PET is not indicated in Prostate Cancer in these situations:
   1. The request is for FDG-PET Scan
   2. The request is for \textsuperscript{18}F-Na (Sodium Fluoride) or PET/Bone scan
   3. The request is for \textsuperscript{18}F-Fluciclovine (AXUMIN\textsuperscript{®}) PET Scan
   4. For initial staging of prostate cancer
   5. For restaging prior to recent conventional imaging
   6. For monitoring response to treatment
   7. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

XXIV. Multiple myeloma and Plasmacytoma\textsuperscript{105-111}

A. Initial staging:
   1. To determine if Plasmacytoma is truly solitary
   2. Suspected extraosseous Plasmacytomas
   3. Suspected progression of MGUS/smoldering myeloma to a more malignant form when conventional imaging (CT/MRI) is negative
   4. Inconclusive conventional imaging

B. Restaging:
   1. Recurrence suspected AND conventional imaging is negative
   2. Negative PET will allow change of management from active treatment to maintenance or surveillance
   3. Determine additional therapies in refractory or non-secretory disease

C. PET is not indicated in Myeloma for:
1. Surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence
2. For bone marrow transplant evaluation or surveillance

**XXV. Metastatic Cancer from an unknown primary site**

A. Initial staging of biopsy proven malignancy when conventional imaging (CT, MRI, nuclear scans) fail to demonstrate a primary site
B. PET is not indicated for surveillance of an asymptomatic individual not on treatment and having no new signs or symptoms concerning for recurrence

**XXVI. Castleman’s disease (unicentric and multicentric)**

A. Initial staging - Either CT Chest (CPT®71260) and CT Abdomen/Pelvis with contrast (CPT®74177) or PET/CT (CPT®78815)
B. Restaging: Either CT Chest (CPT®71260) and CT Abdomen/Pelvis with contrast (CPT®74177) or PET/CT (CPT®78815) for one of the following:
   1. Multicentric disease or surgically unresected unicentric disease on chemotherapy every 2 cycles
   2. Suspected recurrence based on one of the following:
      a. Recurrent B symptoms
      b. Rising LDH/IL-6/VEGF levels

**XXVII. Abdominal Lymphadenopathy**

A. Clinical or lab findings suggesting a lymphoproliferative disorder:
   1. Biopsy
   2. If biopsy is negative or inconclusive, PET (CPT®78815) can be considered
   3. PET can be considered if requested to find the most appropriate LN for biopsy in this scenario.
B. Clinical or laboratory findings suggesting benign etiology, and no history of malignancy
   1. 3-month follow-up CT Abdomen/Pelvis (CPT®74177).
   2. If no changes at 3 months, 2 additional follow-up scans (at 6 months and one year) can be approved.
   3. If no changes by one year, the finding can be considered benign. No further imaging.
   4. If a follow-up CT demonstrates a concerning change, biopsy should be performed. If biopsy is inconclusive, PET/CT (CPT®78815) can be approved

**XXVIII. Adrenal Cortical Lesions**

A. 1 cm to < 4 cm, History of cancer, No prior imaging for comparison and indeterminate imaging on any CT or MRI
   1. APW/RPW < 60/40%: PET CT; consider biopsy; Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection
   2. If enlarging or new lesion: PET CT or biopsy; Biochemical evaluation to determine functional status and exclude pheochromocytoma prior to biopsy/resection
B. > 4 cm, History of cancer, > 10 HU on NCCT and Indeterminate imaging features on any CT or MRI
   1. PET CT or biopsy
   2. Consider biochemical assays to determine functional status and exclude pheochromocytoma prior to biopsy / resection

**XXIX. Spleen - Incidental splenic findings on CT or MRI:**

A. Imaging is diagnostic of a benign lesion (simple cyst, hemangioma) or characteristics are benign-appearing (homogenous, low attenuation, no enhancement, smooth margins): No follow-up imaging.

B. Imaging characteristics are not diagnostic:
   1. Prior imaging available:
      a. One year stability: no follow up imaging
      b. Lack of stability: consider MRI if not done, biopsy, or PET.

C. No prior imaging:
   1. No known malignancy
   2. Suspicious imaging features: (suggesting possible malignancy)
      a. MRI if not already done or biopsy
      b. If MRI still inconclusive and biopsy is not feasible then PET can be considered
   3. Indeterminate imaging features: (equivocal but not suspicious for malignancy) Follow up MRI in 6 and 12 months.
   4. Known malignancy:
      a. < 1 cm: follow up MRI in 6 and 12 months.
      b. > 1 cm: consider MRI if not done, biopsy.
         i. If MRI still inconclusive and biopsy is not feasible then PET can be considered

**XXX. Takayasu arteritis - Any of the following are indicated for evaluation of Takayasu arteritis:**

A. MRA of the affected body area(s) (contrast as requested)
B. CTA of the affected body area(s) (contrast as requested)
C. Ultrasound with Doppler of the affected body area(s)
D. PET is also very sensitive in detecting large vessel and is useful in the early diagnosis of large vessel vasculitis, but its role in monitoring disease activity during treatment is not known. Patients with aggressive disease being treated with systemic therapy can have imaging (see specific sections for details regarding modality and contrast level) approved for treatment response every 3 months during active treatment
References:


78811, 78812, 78813 PET Scan, and 78814, 78815, 78816 PET/CT Scan

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G0219 PET Imaging Whole Body; Melanoma for Non-covered Indications

This procedure is not a covered benefit for Medicare beneficiaries.
G0219 PET Imaging Whole Body; Melanoma for Non-covered Indications

This procedure is considered investigational/experimental.
G0235 PET Imaging Any Site Not Otherwise Specified

This code should be redirected to CPT codes 78811 through 78816.
G0252 PET Imaging Full and Partial-Ring PET Scanners Only, for Initial Diagnosis of Breast Cancer and/or Surgical Planning for Breast Cancer (e.g., Initial Staging of Axillary Lymph Nodes)

This code should be redirected to CPT codes 78811 through 78816.
G0297 Low Dose CT of the Chest for Lung Cancer Screening

U.S. Preventative Services Task Force: Lung Cancer Screening (Commercial and Medicaid)

Low-dose chest CT (CPT® G0297) may be approved for lung cancer screening if all of the following criteria are met:

<table>
<thead>
<tr>
<th>Screening Indications – Commercial and Medicaid</th>
<th>Imaging Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>➤ All criteria below must be met for approval:</td>
<td>Low-Dose Chest CT without contrast CPT® G0297</td>
</tr>
<tr>
<td>✷ Patient has not received a low-dose CT lung screening in less than 12 months; and</td>
<td></td>
</tr>
<tr>
<td>✷ Patient has NO health problems that substantially limit life expectancy or the ability or willingness to have curative lung surgery*; and</td>
<td></td>
</tr>
<tr>
<td>✷ Patient is between 55 and 80 years of age; and</td>
<td></td>
</tr>
<tr>
<td>✷ Patient has at least a 30 pack-year history of cigarette smoking; and</td>
<td></td>
</tr>
<tr>
<td>✷ Currently smokes or quit within the past (&lt;=) 15 years</td>
<td></td>
</tr>
</tbody>
</table>

*This is based on a range of chest or other organ signs, symptoms or conditions which would question the member’s ability to undergo surgical or non-surgical treatment if a lung cancer was discovered. For example, congestive heart failure, advanced cancer from another site or a member with COPD who uses oxygen when ambulating, would be examples of conditions that would “substantially limit life expectancy.” Conversely, stable COPD and its symptoms, including cough, shortness of breath would not “substantially limit life expectancy.”

I. Incidental Pulmonary Nodules Detected on Low Dose CT Chest (LDCT) Images

   A. Additional intervening CT Chest or LDCT can be approved based on a LDCT Lung-RADS Version-1.0 designation 3 or 4, as indicated in the charts below.
<table>
<thead>
<tr>
<th>Primary Category/Category Descriptor*</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>3: Probably benign finding(s) - short term follow up suggested; includes nodules with a low likelihood of becoming a clinically active cancer</td>
<td>6 month LDCT</td>
</tr>
<tr>
<td>4A: Suspicious - Findings for which additional diagnostic testing and/or tissue sampling is recommended</td>
<td>3 month LDCT PET/CT may be used when there is a ≥ 8 mm solid component</td>
</tr>
<tr>
<td>4B: Suspicious - Findings for which additional diagnostic testing and/or tissue sampling is recommended</td>
<td>Chest CT with or without contrast, PET/CT and/or tissue sampling depending on the probability of malignancy and. PET/CT may be used when there is a ≥ 8 mm solid component.</td>
</tr>
</tbody>
</table>

B. Category 3 and 4A nodules that are unchanged on interval CT should be coded as category 2, and individuals returned to screening in 12 months.³

C. For example, if the first LDCT was done January 1st and designated Lung-RADS 3 with an interval LDCT done on July 1st – the LDCT annual screening would resume January 1st of the following year.

D. Category 4B is intended to direct the individual out of screening and into a diagnosis based on a larger, growing or increasingly suspicious nodule.³
<table>
<thead>
<tr>
<th>Category</th>
<th>Category Descriptor</th>
<th>Findings</th>
<th>Management</th>
<th>Probability of Malignancy</th>
<th>Estimated Population Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete</td>
<td>-</td>
<td>0</td>
<td>Additional lung cancer screening CT images and/or comparison to prior chest CT examinations is needed</td>
<td>n/a</td>
<td>1%</td>
</tr>
<tr>
<td>Negative</td>
<td>No nodules and definitely benign nodules</td>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>Benign Appearance or Behavior</td>
<td>Nodules with a very low likelihood of becoming a clinically active cancer due to size or lack of growth</td>
<td>solid nodule(s): &lt; 6 mm new &lt; 4 mm</td>
<td>Continue annual screening with LDCT in 12 months</td>
<td>&lt; 1%</td>
<td>90%</td>
</tr>
<tr>
<td>Probable Benign</td>
<td>Probably benign finding(s) - short term follow up suggested; includes nodules with a low likelihood of becoming a clinically active cancer</td>
<td>solid nodule(s): ≥ 6 to &lt; 8 mm at baseline OR new 4 mm to &lt; 6 mm</td>
<td>part solid nodule(s) ≥ 6 mm total diameter with solid component &lt; 6 mm OR new &lt; 6 mm total diameter</td>
<td>1-2%</td>
<td>5%</td>
</tr>
<tr>
<td>Suspicious</td>
<td>Findings for which additional diagnostic testing and/or tissue sampling is recommended</td>
<td>4A</td>
<td>solid nodule(s): ≥ 8 to &lt; 15 mm at baseline OR growing &lt; 8 mm OR new 6 to &lt; 8 mm</td>
<td>3 month LDCT; PET/CT may be used when there is a ≥ 8 mm solid component</td>
<td>5-15%</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>4B</td>
<td>part solid nodule(s): ≥ 6 mm with solid component ≥ 6 mm to &lt; 8 mm OR with a new or growing &lt; 4 mm solid component</td>
<td>Chest CT with or without contrast, PET/CT and/or tissue sampling depending on the *probability of malignancy and comorbidities. PET/CT may be used when there is a ≥ 8 mm solid component.</td>
<td>&gt; 15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4X</td>
<td>Category 3 or 4 nodules with additional features or imaging findings that increases the suspicion of malignancy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Other | Clinically Significant or Potentially Clinically Significant Findings (non lung cancer) | S | modifier - may add on to category 0-4 coding | As appropriate to the specific finding | n/a | \10% |

| Prior Lung Cancer | Modifier for patients with a prior diagnosis of lung cancer who return to screening | C | modifier - may add on to category 0-4 coding | - | - | - |

*The full description of the LUNG-RADS categories

References:


This code will be redirected to G0297 for both Non-Medicare and Medicare indications.

S8032 Low Dose CT of the Chest for Lung Cancer Screening

S8032 Low Dose CT of the Chest for Lung Cancer Screening
This code should be redirected to CPT Code 74183.
S8042 MRI Low Field

This code should be redirected to an MRI CPT Code.
S8080 Scintimammography

These procedures are considered investigational and/or experimental for most health plans. Please check specific health plan medical policy for coverage.
S8085 FDG (F-18 FDG) Imaging Using Dual-Head Coincidence Detection System (Non-dedicated PET Scan)

This code should be redirected to CPT codes 78811 - 78816.
S8092 Electron Beam Computed Tomography (Also Known as Ultrafast CT, CINET)

This procedure is not a covered benefit.