Spinal Ultrasonography (for Indiana Only)

Policy Number: CS113IN.01
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Instructions for Use

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Related Policies
None

Application

This Medical Policy only applies to the state of Indiana.

Coverage Rationale

Spinal and paraspinal ultrasonography is proven and medically necessary in newborns and infants for evaluating and managing suspected spinal disorders including:

- Caudal regression syndrome, including sacral agenesis, anal atresia, or stenosis
- Detection of sequelae of injury, such as:
  - Hematoma following injury such as birth injury
  - Infection or hemorrhage secondary to prior instrumentation such as lumbar puncture
  - Post-traumatic leakage of cerebrospinal fluid
- Evaluation of suspected defects such as cord tethering, diastematomyelia, hydromyelia, or syringomyelia
- Guidance for lumbar puncture
- Lumbosacral stigmata known to be associated with spinal dysraphism
- Post-operative assessment for cord retethering
- Visualization of blood products within the spinal canal in newborns and infants with intracranial hemorrhage

Spinal and paraspinal ultrasonography is unproven and not medically necessary for the following uses due to insufficient evidence of efficacy:

- To diagnose and manage spinal pain and radiculopathies
- To guide rehabilitation of neuromusculoskeletal disorders and spinal pain

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CPT Code	Description
76800	Ultrasound, spinal canal and contents

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Diagnosis Code	Description
G95.0	Syringomyelia and syringobulbia
G95.11	Acute infarction of spinal cord (embolic) (nonembolic)
G95.89	Other specified diseases of spinal cord
G96.0	Cerebrospinal fluid leak [post-hyphentrauma]
G97.51	Postprocedural hemorrhage of a nervous system organ or structure following a nervous system procedure
G97.61	Postprocedural hematoma of a nervous system organ or structure following a nervous system procedure
G97.63	Postprocedural seroma of a nervous system organ or structure following a nervous system procedure
M41.00	Infantile idiopathic scoliosis, site unspecified
M41.02	Infantile idiopathic scoliosis, cervical region
M41.03	Infantile idiopathic scoliosis, cervicothoracic region
M41.04	Infantile idiopathic scoliosis, thoracic region
M41.05	Infantile idiopathic scoliosis, thoracolumbar region
M41.06	Infantile idiopathic scoliosis, lumbar region
M41.07	Infantile idiopathic scoliosis, lumbosacral region
M41.08	Infantile idiopathic scoliosis, sacral and sacrococcygeal region
M41.112	Juvenile idiopathic scoliosis, cervical region
M41.113	Juvenile idiopathic scoliosis, cervicothoracic region
M41.114	Juvenile idiopathic scoliosis, thoracic region
M41.115	Juvenile idiopathic scoliosis, thoracolumbar region
M41.116	Juvenile idiopathic scoliosis, lumbar region
M41.117	Juvenile idiopathic scoliosis, lumbosacral region
M41.119	Juvenile idiopathic scoliosis, site unspecified
M41.122	Adolescent idiopathic scoliosis, cervical region
M41.123	Adolescent idiopathic scoliosis, cervicothoracic region
M41.124	Adolescent idiopathic scoliosis, thoracic region
M41.125	Adolescent idiopathic scoliosis, thoracolumbar region
M41.126	Adolescent idiopathic scoliosis, lumbar region
M41.127	Adolescent idiopathic scoliosis, lumbosacral region
M41.129	Adolescent idiopathic scoliosis, site unspecified
M41.20	Other idiopathic scoliosis, site unspecified
M41.22	Other idiopathic scoliosis, cervical region
M41.23	Other idiopathic scoliosis, cervicothoracic region
M41.24	Other idiopathic scoliosis, thoracic region
M41.25	Other idiopathic scoliosis, thoracolumbar region
M41.26	Other idiopathic scoliosis, lumbar region
M41.27	Other idiopathic scoliosis, lumbosacral region

Diagnosis Code	Description
M41.30	Thoracogenic scoliosis, site unspecified
M41.34	Thoracogenic scoliosis, thoracic region
M41.35	Thoracogenic scoliosis, thoracolumbar region
M41.40	Neuromuscular scoliosis, site unspecified
M41.41	Neuromuscular scoliosis, occipito-atlanto-axial region
M41.42	Neuromuscular scoliosis, cervical region
M41.43	Neuromuscular scoliosis, cervicothoracic region
M41.44	Neuromuscular scoliosis, thoracic region
M41.45	Neuromuscular scoliosis, thoracolumbar region
M41.46	Neuromuscular scoliosis, lumbar region
M41.47	Neuromuscular scoliosis, lumbosacral region
M41.50	Other secondary scoliosis, site unspecified
M41.52	Other secondary scoliosis, cervical region
M41.53	Other secondary scoliosis, cervicothoracic region
M41.54	Other secondary scoliosis, thoracic region
M41.55	Other secondary scoliosis, thoracolumbar region
M41.56	Other secondary scoliosis, lumbar region
M41.57	Other secondary scoliosis, lumbosacral region
M41.80	Other forms of scoliosis, site unspecified
M41.82	Other forms of scoliosis, cervical region
M41.83	Other forms of scoliosis, cervicothoracic region
M41.84	Other forms of scoliosis, thoracic region
M41.85	Other forms of scoliosis, thoracolumbar region
M41.86	Other forms of scoliosis, lumbar region
M41.87	Other forms of scoliosis, lumbosacral region
M41.9	Scoliosis, unspecified
M51.86	Other intervertebral disc disorders, lumbar region
M51.87	Other intervertebral disc disorders, lumbosacral region
P10.0	Subdural hemorrhage due to birth injury
P10.1	Cerebral hemorrhage due to birth injury
P10.2	Intraventricular hemorrhage due to birth injury
P10.3	Subarachnoid hemorrhage due to birth injury
P10.8	Other intracranial lacerations and hemorrhages due to birth injury
P10.9	Unspecified intracranial laceration and hemorrhage due to birth injury
P11.5	Birth injury to spine and spinal cord
P52.0	Intraventricular (nontraumatic) hemorrhage, grade 1, of newborn
P52.1	Intraventricular (nontraumatic) hemorrhage, grade 2, of newborn
P52.21	Intraventricular (nontraumatic) hemorrhage, grade 3, of newborn
P52.22	Intraventricular (nontraumatic) hemorrhage, grade 4, of newborn
P52.3	Unspecified intraventricular (nontraumatic) hemorrhage of newborn
P52.4	Intracerebral (nontraumatic) hemorrhage of newborn
P52.5	Subarachnoid (nontraumatic) hemorrhage of newborn

Diagnosis Code	Description
P52.6	Cerebellar (nontraumatic) and posterior fossa hemorrhage of newborn
P52.8	Other intracranial (nontraumatic) hemorrhages of newborn
P52.9	Intracranial (nontraumatic) hemorrhage of newborn, unspecified
Q05.0	Cervical spina bifida with hydrocephalus
Q05.1	Thoracic spina bifida with hydrocephalus
Q05.2	Lumbar spina bifida with hydrocephalus
Q05.3	Sacral spina bifida with hydrocephalus
Q05.4	Unspecified spina bifida with hydrocephalus
Q05.5	Cervical spina bifida without hydrocephalus
Q05.6	Thoracic spina bifida without hydrocephalus
Q05.7	Lumbar spina bifida without hydrocephalus
Q05.8	Sacral spina bifida without hydrocephalus
Q05.9	Spina bifida, unspecified
Q06.0	Amyelia
Q06.1	Hypoplasia and dysplasia of spinal cord
Q06.2	Diastematomyelia
Q06.3	Other congenital cauda equina malformations
Q06.4	Hydromyelia
Q06.8	Other specified congenital malformations of spinal cord
Q06.9	Congenital malformation of spinal cord, unspecified
Q07.00	Arnold-Chiari syndrome without spina bifida or hydrocephalus
Q07.01	Arnold-Chiari syndrome with spina bifida
Q07.02	Arnold-Chiari syndrome with hydrocephalus
Q07.03	Arnold-Chiari syndrome with spina bifida and hydrocephalus
Q07.8	Other specified congenital malformations of nervous system
Q07.9	Congenital malformation of nervous system, unspecified
Q42.2	Congenital absence, atresia and stenosis of anus with fistula
Q42.3	Congenital absence, atresia and stenosis of anus without fistula
Q76.49	Other congenital malformations of spine, not associated with scoliosis
Q87.2	Congenital malformation syndromes predominantly involving limbs
Q89.8	Other specified congenital malformations

Description of Services

Ultrasonography is a noninvasive imaging technique that relies on detection of the reflections or echoes generated as high-frequency sound waves are passed into the body. This technique is commonly used for a number of imaging purposes such as investigation of abdominal and pelvic masses, cardiac echocardiography, and prenatal fetal imaging. Less commonly, it has also been applied to detection of spinal and paraspinal disorders. Ultrasonography of the spinal canal and its contents includes imaging of the spinal cord, the vertebrae, and the intervertebral discs.

In newborns and infants, various tumors and disorders, especially neurological and vascular malformations, can be detected with spinal ultrasound (US). In newborns up to six months of age, spinal cord lesions can be detected with US because the posterior elements are membranous rather than bony. Beyond this age, these elements calcify, reserving magnetic resonance imaging (MRI) for cases where spinal ultrasound is equivocal or has revealed a definite abnormality. (ACR, 2016)

Spinal ultrasonography has also been used for investigation of neonatal spinal dysraphism, a disorder resulting from incomplete closure of the neural tube during gestation. This type of birth defect occurs in approximately 2 per 1000 live births, and the resulting spinal disorders include spinal agenesis, low cord, tethered cord, hydromyelia, diastematomyelia, myelocystocele, and myelomeningocele. Spinal ultrasonography may be used as the primary screening tool, reserving magnetic resonance imaging (MRI) for cases where spinal ultrasound is equivocal or has revealed a definite abnormality.

In adults, spinal ultrasonography has been used to investigate degenerative disc disease to determine whether back pain is a consequence of fissuring or herniation of the gelatinous discs that separate the vertebrae. Spinal ultrasound has also been used in the assessment of injuries to paraspinal ligaments after spinal fractures. Although ultrasonography has limited ability to reveal bone and tissues surrounding bone, it has been studied as a means to assess the posterior ligament complex that contributes to the maintenance of spinal stability.

Compared with computed tomography (CT) and magnetic resonance imaging (MRI), ultrasonography provides less detailed images of bone and the structures within and near bone. However, ultrasonography has the advantages of being simpler, more widely available, requiring no exposure to ionizing radiation, and having less susceptibility to patient movement.

Spinal ultrasonography is also being studied to determine if it can be used to guide rehabilitation of neuromusculoskeletal disorders and back pain. In this application, rehabilitative ultrasound imaging (RUSI) has been defined as a "procedure used by physical therapists to evaluate muscle and related soft tissue morphology and function during exercise and physical tasks. RUSI is used to assist in the application of therapeutic interventions, providing feedback to the patient and physical therapist." This information assists in determining which exercise treatment or rehabilitation programs can improve neuromuscular function for the individual. (Teyhen, 2006)

Clinical Evidence

Spinal and Paraspinal Ultrasonography in Newborns and Infants

Valente et al (2019) indicated that since the 1980's, ultrasound (US) has been the first-line imaging modality for the assessment of spinal cord development abnormalities. In fact, within 6 months of life, the non-ossification of neuronal arcs provides an excellent acoustic window that allows a detailed depiction of the spinal canals, its content and of the surrounding soft tissue. The authors' review briefly summarized the US technique, the main clinical indication and the key notions that could help to properly perform this type of US examination.

Professional Societies/Position Statements

American College of Radiology (ACR)/American Institute of Ultrasound in Medicine (AIUM)/Society for Pediatric Radiology (SPR)/ Society of Radiologists in Ultrasound (SRU)

In a 2016, the AIUM, ACR, SPR, and SRU jointly published a practice parameter for the Performance of an Ultrasound Examination of the Neonatal Spine stating the following for neonatal spinal ultrasound:

- Indications including but not limited to:
  - Lumbosacral stigmata known to be associated with spinal dysraphism and tethered spinal cord, including but not limited to:
    - Midline or paramedian masses
    - Midline skin discolorations
    - Skin tags
    - Hair tufts
    - Hemangiomas
    - Small midline dimples
    - Paramedian deep dimples
  - The spectrum of caudal regression syndrome, including patients with sacral agenesis and patients with anal atresia or stenosis
  - Evaluation of suspected cord abnormalities such as cord tethering, diastematomyelia, hydromyelia, syringomyelia
  - Detection of sequelae of injury, such as:
    - Hematoma following injury such as birth injury
    - Infection or hemorrhage secondary to prior instrumentation, such as lumbar puncture

        - Post-traumatic leakage of cerebrospinal fluid (CSF)
    - Visualization of blood products within the spinal canal in patients with intracranial hemorrhage
    - Guidance for lumbar puncture
    - Postoperative assessment for cord retethering
- Contraindications:
    - Preoperative examination in patients with open spinal dysraphic defect. However, in such cases the closed portion of the spinal canal away from the open defect can be examined for other suspected abnormalities, such as syrinx or diastematomyelia. These latter abnormalities should be identified preoperatively.
    - Examination of the contents of a closed neural tube defect if the skin overlying the defect is thin or no longer intact

The practice parameter states, "In experienced hands, ultrasound of the infant spine has been demonstrated to be an accurate and cost-effective examination that is comparable to MRI for evaluating congenital or acquired abnormalities in the neonate and young infant."

Spinal and Paraspinal Ultrasonography in Adults or Individuals with Spinal Injuries

There is insufficient evidence in the peer-reviewed medical literature to establish the efficacy or clinical value of spinal and paraspinal ultrasonography as a diagnostic tool in the management of back pain, radiculopathies or for monitoring of therapies in adults. The use of ultrasound imaging to guide rehabilitation is under investigation. More research is needed to define the role of rehabilitative ultrasound imaging.

Lee et al (2017) conducted a retrospective study of 74 patients with cervical radiculopathy who received an ultrasonography-guided nerve block at an outpatient clinic from July 2012 to July 2014. Before actual injection of the steroid was performed, the authors evaluated the vulnerable blood vessels around each C5, C6, and C7 nerve root of each patient's painful side, with Doppler ultrasound. The results of this study showed that there was a high prevalence of vulnerable blood vessels, either at the targeted nerve root or at the site of the needle' projected pathway to the nerve root. Also, it shows a higher prevalence of vulnerable blood vessels either at the targeted nerve root or at the site of an imaginary needle's projected pathway to the nerve root as the spinal nerve root level gets lower. The authors concluded that routinely evaluating for the presence of vulnerable blood vessels around each cervical nerve root using Doppler ultrasound imaging before the cervical nerve root block, (especially for the lower cervical nerve root level) is necessary to prevent unexpected critical complications, This study has several limitations identified by the authors: only C5-7 cervical root level were examined; lack of detailed clinical data, as well as sociodemographic and long term outcomes; and not evaluating the efficacy of US guided nerve block, only showing vulnerable arteries. Additionally, this study is uncontrolled with a small sample size, and further investigation is needed before clinical usefulness of this procedure is proven.

Perlas et al (2016) conducted a systematic review and meta-analysis to examine the evidence for preprocedural neuraxial ultrasound as an adjunct to lumbar spinal and epidural anesthesia in adults. Electronic databases were searched for randomized controlled and cohort studies that reported data for one or more of the following questions: (1) Does ultrasound accurately identify a given lumbar intervertebral space? (2) Does ultrasound accurately predict the needle insertion depth required to reach the epidural or intrathecal space? (3) Does ultrasound improve the efficacy and safety of spinal or lumbar epidural anesthesia? Thirty-one clinical trials and 1 meta-analysis met these inclusion criteria. 8 studies indicate that neuraxial ultrasound can identify a given lumbar intervertebral space more accurately than by landmark palpation alone. Thirteen studies reported an excellent correlation between ultrasound-measured depth and needle insertion depth to the epidural or intrathecal space. The mean difference between the 2 measurements was within 3 mm in most studies. Thirteen RCTs, 5 cohort studies, and 1 meta-analysis reported data on efficacy and safety outcomes. Results consistently showed that ultrasound resulted in increased success and ease of performance. There is significant evidence supporting the role of neuraxial ultrasound in improving the precision and efficacy of neuraxial anesthetic techniques and reduce the risk of traumatic procedures but there was otherwise insufficient evidence to conclude if it significantly improves safety.

In an article discussing the assessment of spinal pain, Braun et al. (2014) stated that the main imaging techniques used for the detection of spinal pathologies are conventional radiographs, CT, and MRI.

Professional Societies/Position Statements

American Chiropractic Association (ACA)

In a 1996, policy titled Diagnostic Ultrasound of the Adult Spine, the ACA states that-the application of diagnostic ultrasound in the adult spine in areas such as disc herniation, spinal stenosis and nerve root pathology is inadequately studied and its routine application for these purposes cannot be supported by the evidence at this time. This position has not been changed despite annual re-evaluation.

American College of Physicians/American Pain Society (ACP/APS)

In a 2007 joint clinical practice guideline from the American College of Physicians and the American Pain Society, for the diagnosis and treatment of low back pain, imaging recommendations include MRI and CT for persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis.

American Institute of Ultrasound in Medicine (AIUM)

The AIUM's statement regarding nonoperative spinal/paraspinal ultrasounds in adults was published in 2014 and reaffirmed in 2019. In the official statement, the authors reported there is insufficient evidence in the peer-reviewed medical literature establishing the value of nonoperative spinal/paraspinal ultrasound in adults. Therefore, the AIUM states that, at this time, the use of nonoperative spinal/paraspinal ultrasound in adults (for study of intervertebral discs, facet joints and capsules, central nerves and fascial edema, and other subtle paraspinous abnormalities) for diagnostic evaluation, screening, diagnostic evaluation, including pain or radiculopathy syndromes, and for monitoring of therapy has no proven clinical utility.

American College of Radiology (ACR)

In the ACR Appropriateness Criteria for chronic back pain and suspected sacroiliitis/spondyloarthropathy, an expert panel on musculoskeletal imaging concluded that although a few studies show potential for the use of US with Doppler imaging of the sacroiliac joints for initial screening and for follow-up of treatment, more research needs to be done before US can be included in their general diagnostic imaging recommendations. (2016)

Rehabilitative Ultrasound Imaging (RUSI)

There are conflicting conclusions from systematic reviews about the reliability of ultrasound imaging. Hebert, et al (2009) determined that there is good reliability of ultrasound imaging within the majority of research studies that measured the abdominal and lumbar trunk muscles. The levels of reliability were influenced by several factors: operator experience; measurement targets (measures of muscle thickness were more reliable than cross-sectional area); and calculation methodology (a mean of measures was more reliable). In another recent systematic review Costa, et al (2009) concluded, "The current evidence of the reproducibility of RUSI [rehabilitative ultrasound imaging] for measuring abdominal muscle activity is based mainly on studies with suboptimal designs and the study of people who were healthy." The authors highlighted a lack of studies investigating the reproducibility of muscle thickness changes and differences in thickness changes over time as a key limitation of existing research on the reliability of ultrasound imaging for assessing the abdominal wall muscles. In addition to systematic reviews on the reliability of rehabilitative ultrasound imaging, questions about the influence of gender, body mass index, posture, hand dominance, and different populations on muscle morphology remain unclear (Teyhen, 2006).

Interest in rehabilitative ultrasound imaging (RUSI) of the posterior paraspinal muscles is growing, along with the body of literature to support integration of this technique into routine physical therapy practice. This clinical commentary review (Hides, 2007) shows RUSI can be used as an evaluative and treatment tool and proposes guidelines for its use for the posterior muscles of the lumbar and cervical regions. Measurement of morphological characteristics of the muscles (morphometry) in healthy populations and people with spinal pathology are described. Further investigation of many of these observations is required using controlled studies to provide conclusive evidence that RUSI enhances clinical practice.

RUSI has been used to explore the neurophysiologic mechanisms of interventions e.g., spinal manipulation used in the treatment of common spine-related disorders (Brenner, 2007; Raney, 2007). The associations between variances in muscle morphology and their role in the etiology and/or persistence of spinal complaints are largely unknown (Fernandez-de-las-Penas, 2008).

The clinical utility of spinal ultrasound imaging has received preliminary investigation. Whittaker (2006) outlined challenges of accurate interpretation, hurdles with comparing imaging studies over time, and in generating reliable and meaningful measurements in a clinical environment. Hodges (2006) commented on the consideration of spinal ultrasound imaging from a patient-centered perspective, "whether rehabilitative ultrasound imaging measures contribute to prediction of those who benefit from an intervention, and whether changes in rehabilitative ultrasound imaging measures with intervention are associated with positive clinical outcomes. An additional consideration is whether feedback provided using rehabilitative ultrasound imaging improves clinical outcomes. Although a number of studies have confirmed that treatments that include rehabilitative ultrasound imaging lead to better outcomes than control interventions, these studies have not compared the same exercise interventions with and without feedback from rehabilitative ultrasound imaging." A cross-sectional study (Hebert, 2010) provided preliminary evidence that supports the construct validity of factors predictive of successful clinical outcomes and muscular activation via a stabilization exercise program monitored with ultrasound imaging. This study was limited by the lack of longitudinal follow-up and small sample size.

American Institute of Ultrasound in Medicine (AIUM)

In the AIUM's 2014 official statement, the AIUM states that, at this time, the use of non-operative spinal/paraspinal ultrasound in adults (for study of intervertebral discs, facet joints and capsules, central nerves and fascial edema, and other subtle paraspinous abnormalities) for diagnostic evaluation, for screening, diagnostic evaluation, including pain or radiculopathy syndromes, and for monitoring of therapy has no proven clinical utility.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

The use of musculoskeletal ultrasound to diagnose low back pain is a procedure and, as such, is not regulated by the FDA. However, the devices used to perform this procedure are regulated by the FDA and many ultrasound devices and probes have received FDA approval for marketing. Additional information, under product code IYO (subsequent product codes IXT and IYN), is available at: http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm. (Accessed December 1, 2020)

References

American Chiropractic Association Public Policies. Diagnostic ultrasound of the adult spine 1996.

American College of Radiology (ACR). ACR Appropriateness Criteria. Chronic Back Pain: Suspected Sacroiliitis/ Spondyloarthropathy (2016).

American College of Radiology (ACR), American Institute of Ultrasound in Medicine (AIUM), Society for Pediatric Radiology (SPR), Society of Radiologists in Ultrasound (SRU). Practice Parameter for the Performance of an Ultrasound Examination of the Neonatal and Infant Spine. 2007 (Revised 2016). Reaffirmed by AIUM November 2019.

American Institute of Ultrasound in Medicine (AIUM). Official Statements: Nonoperative Spinal/Paraspinal Ultrasound in Adults April 2014.

American Institute of Ultrasound in Medicine (AIUM). Practice Guideline for the Performance of an Ultrasound Examination of the Neonatal and Infant Spine. October 2007 (Updated 2016).

Braun et al. Assessment of spinal pain. Best Practice & Research: Clinical Rheumatology, 2014: 28(6):875-887.

Chou R, et al. Clinical Efficacy Assessment Subcommittee of the American College of Physicians; American College of Physicians; American Pain Society Low Back Pain Guidelines Panel. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007 Oct 2;147(7):478-91.

Costa LOP, Maher CG, Latimer J, et al. Reproducibility of rehabilitative ultrasound imaging for the measurement of abdominal muscle activity: a systematic review. Physical Therapy. 2009; 89:756-769.

Fernandez-De-Las-Penas C, Albert-Sanchis JC, Buil M, et al. Cross-sectional area of cervical multifidus muscle in females with chronic bilateral neck pain compared to controls. J Orthop Sports Phys Ther. 2008; 38:175-180.

Hebert JJ, Koppenhaver SL, Parent EC, et al. A systematic review of the reliability of rehabilitative ultrasound imaging for the quantitative assessment of the abdominal and lumbar trunk muscles. Spine. 2009; 34:E848–E856.

Hides JA, Wong I, Wilson SJ, et al. Assessment of abdominal muscle function during a simulated unilateral weight-bearing task using ultrasound imaging. J Orthop Sports Phys Ther. 2007 Aug; 37(8):467-71.

Hodges P. Reliability of ultrasound imaging to measure muscle thickness of the lateral abdominal muscles. J Orthop Sports Phys Ther. 2006; 36(8): A-5.

Lee HH, Park D, Oh Y, et al. Ultrasonography Evaluation of Vulnerable Vessels Around Cervical Nerve Roots During Selective Cervical Nerve Root Block. Ann Rehabil Med. 2017 Feb;41(1):66-71.

Perlas A, Chaparro LE, Chin KJ. Lumbar Neuraxial Ultrasound for Spinal and Epidural Anesthesia: A Systematic Review and Meta-Analysis. Reg Anesth Pain Med. 2016 Mar-Apr;41(2):251-60.

Teyhen D. Rehabilitative ultrasound imaging symposium San Antonio, TX. J Orthop Sports Phys Ther. May 8-10, 2006a; 36:A1-3.

Teyhen D, Koppenhaer S. Rehabilitative Ultrasound Imaging. J Phyiother. 2011;7(3):196.

Valente I, Pediclli A, Piacentini M, et al. Spinal cord ultrasonography of the newborn. J Ultrasound 2019 Jun; 22(2):113119.

Whittaker JL. The clinical application of rehabilitative ultrasound imaging (abstract from the Rehabilitative Ultrasound Imaging Symposium). J Orthop Sports Phys Ther. 2006; 36.

Policy History/Revision Information

Date	Summary of Changes
04/01/2021	• New Medical Policy

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the federal, state or contractual requirements for benefit plan coverage must be referenced as the terms of the federal, state or contractual requirements for benefit plan coverage may differ from the standard benefit plan. In the event of a conflict, the federal, state or contractual requirements for benefit plan coverage govern. Before using this policy, please check the federal, state or contractual requirements for benefit plan coverage. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

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