

Colonoscopy

COLON-0: General Guidelines
COLON-1: Average-Risk Screening
COLON-2: High-Risk Screening
COLON-3: Surveillance after Polypectomy
COLON-4: Surveillance After Diagnosis of Colorectal Cancer¹¹
COLON-5: Inflammatory Bowel Disease
COLON-6: Irritable Bowel Syndrome
COLON-7: Constipation
COLON-8: Diarrhea
COLON-9: GI Bleeding
COLON-10: Abdominal Pain
COLON-11: Unexplained Weight Loss
COLON-12: Abnormal Radiologic Study
COLON-13: Repeat Colonoscopy for Inadequate Preparation
COLON-14: Therapeutic Colonoscopy
COLON-15: Metastatic Cancer of Unknown Primary Site
COLON-16: Colonoscopy Via Stoma
COLON-17: Genetic Syndromes
COLON-18: Colonoscopy After Noninvasive Testing

COLON-0: General Guidelines

- eviCore's Gastrointestinal Endoscopy Program applies an evidence-based approach to evaluate the most appropriate care for each individual. This evaluation requires submission of medical records pertinent to the treatment and/or services being requested by the provider.
- If the medical records provided do not provide sufficiently detailed information to understand the individual's current clinical status, then the medical necessity for the request cannot be established and the request cannot be approved.
- Specific elements of an individual's medical records commonly required to establish medical necessity include, but are not limited to:
 - ◆ Recent virtual or in-person clinical evaluation which includes a detailed history and physical examination
 - ◆ Laboratory studies
 - ◆ Imaging studies
 - ◆ Pathology reports
 - ◆ Procedure reports
 - ◆ Reports from other providers participating in treatment of the relevant condition
- Adequate clinical information must be submitted to eviCore in order to establish medical necessity for gastrointestinal endoscopy services. Pertinent clinical evaluation (within 60 days) including a recent detailed history, physical examination, and/or laboratory and prior imaging studies should be performed prior to considering endoscopy. Other meaningful contact (telehealth visit, telephone or video call, electronic mail or messaging) by an established individual can substitute for an in-person clinical evaluation.
- eviCore reserves the right to change and update the Gastrointestinal Endoscopy Policy. The Policy undergo a formal review at least annually. eviCore's policy is based upon major national and international association and society guidelines and criteria, peer reviewed literature, major treatises, as well as input from health plans, and practicing academic and community-based physicians.
- This policy is not intended to supersede or replace sound medical judgment, but instead, should facilitate the identification of the most appropriate treatment given the individual's clinical condition. This policy is written to cover most gastrointestinal endoscopic indications. However, the policy may not be applicable in certain clinical circumstances. Physician judgment may override the policy. Clinical decisions, including treatment decisions, are the responsibility of the individual and his/her provider. Clinicians are expected to use independent medical judgment, which takes into account the clinical circumstances to determine individual management decisions.
- All time intervals in the guideline refer to colonoscopy, unless otherwise stated.
- Requests for Open-Access Colonoscopy must meet criteria according these guidelines.

- The terms “male” and “female” used in these guidelines refer to anatomic-specific diseases and disease predispositions associated with individuals’ sex assigned at birth rather than their gender identity. It should be noted that gender identity and anatomic specific diseases as well as disease predispositions are not always linked. As such, these guidelines should be applied to the individual’s corresponding known or suspected anatomic-specific disease or disease predisposition. At eviCore, we believe that it is important to understand how all individuals, including those who are gender diverse, choose to identify themselves. To ensure that gender-diverse individuals are treated with respect and that decisions impacting their healthcare are made correctly and with sensitivity, eviCore recognizes all individuals with the following gender marker options: Male, Female, Transgender male, Transgender female, “X”, and “Not specified”.
- State and federal legislations may need to be considered in the review of gastrointestinal endoscopy requests.
- eviCore supports the Choosing Wisely initiative (www.choosingwisely.org) by the American Board of Internal Medicine (ABIM) Foundation and many national physician organizations, to reduce the overuse of diagnostic tests that are low value, no value, or whose risks are greater than the benefits.
- CPT® (Current Procedural Terminology) is a registered trademark of the American Medical Association (AMA). CPT® five digit codes, nomenclature, and other data are copyright 2019 American Medical Association. All Rights Reserved. No fee schedules, basic units, relative values, or related listings are included in the CPT® book. AMA does not directly or indirectly practice medicine or dispense medical services. AMA assumes no liability for the data contained herein or not contained herein.

COLON-1: Average-Risk Screening

- “Average-risk” is defined as an asymptomatic individual with no previously diagnosed:
 - ◆ Colorectal cancer
 - ◆ Colonic adenomas
 - ◆ Inflammatory bowel disease involving the colon
- Colonoscopy every 10 years, beginning at age 45, up to age 85
 - ◆ Abnormal findings on an average-risk screening examination should be followed up according to the specific guideline for that finding
- See: **AB-25.1: CT Colonography (CTC)** for imaging guidelines regarding screening CT Colonography and FIT-DNA testing
- See: **COLON-18: Colonoscopy After Noninvasive Testing** for guidelines regarding colonoscopy after noninvasive colon cancer screening test (Cologuard, FIT-DNA, etc.)

COLON-2: High-Risk Screening

- Family history of colorectal cancer (CRC):
 - ◆ Colonoscopy every 5 years beginning 10 years younger than the age at which the youngest first-degree relative was diagnosed, or age 40 years, whichever is earlier, if ANY of the following:
 - One or more first-degree relative with CRC or an advanced adenoma (defined as a polyp \geq 1 cm in size, or with high-grade dysplasia, or required surgery to remove the polyp) diagnosed at age \leq 60 years
 - Two first-degree relatives (parent, sibling, child) with CRC or documented advanced adenomas at any age
 - One or more first-degree relatives with a documented advanced serrated lesion (a sessile serrated polyp or a traditional serrated adenoma \geq 10mm in size) or a sessile serrated polyp with cytologic dysplasia
 - ◆ Colonoscopy beginning at age 40 years, but then every 10 years (average-risk screening schedule) if:
 - One first degree relative diagnosed at age $>$ 60 years
- See also: **Background and Supporting Information: High-risk Screening**
- Genetic Syndromes
 - ◆ See: **COLON-11: Genetic Syndromes**

COLON-3: Surveillance after Polypectomy

- The proper application of surveillance guidelines requires information regarding the size, number, and histologic findings from the initial baseline colonoscopy.
- First surveillance colonoscopy intervals after polypectomy:
 - ◆ Adenomatous Polyps:
 - If no polyps found on screening or other colonoscopy: 10 years (average risk)
 - 1-2 tubular adenomas $<$ 10mm: 7-10 years
 - 3-4 tubular adenomas $<$ 10mm: 3-5 years
 - 5-10 tubular adenomas $<$ 10mm: 3 years
 - One or more tubular adenomas \geq 10mm: 3 years
 - Adenoma with tubulovillous or villous histology: 3 years
 - Adenoma with high-grade dysplasia: 3 years.
 - $>$ 10 adenomas on a single examination: 1 year
 - Piecemeal resection of adenoma \geq 20mm: 6 months
 - ◆ Hyperplastic polyps:
 - All polyps located in the rectum and/or sigmoid colon:
 - \leq 20 polyps, size $<$ 10mm: Repeat in 10 years
 - Polyps located proximal to the sigmoid colon:
 - \leq 20 polyps, size $<$ 10mm: Repeat in 10 years
 - Polyps \geq 10mm: Repeat in 5-10 years
 - $>$ 20 polyps Follow Serrated Polyposis Syndrome guidelines (**COLON-17: Genetic Syndromes**)

- ◆ Sessile Serrated Polyps:
 - 1-2 polyps < 10mm in size: Repeat in 5-10 years
 - 3-4 polyps < 10mm in size: Repeat in 3-5 years
 - 5-10 polyps < 10mm in size: Repeat in 3 years
 - Polyp ≥ 10mm: Repeat in 3 years
 - Isolated polyp containing dysplasia: Repeat in 3 years
 - Piecemeal resection of SSP > 20mm: Repeat in 6 months
 - See also: Serrated Polyposis Syndrome in **COLON-17: Genetic Syndromes**
- ◆ Traditional Serrated Adenoma:
 - Repeat in 3 years
- Second surveillance colonoscopy (stratified by baseline and first surveillance adenoma findings):
 - ◆ **If Baseline Colonoscopy/Polypectomy Findings show 1-4 tubular adenomas < 10 mm:**
 - First surveillance colonoscopy findings:
 - Normal colonoscopy:
 - Second surveillance colonoscopy: Repeat in 10 years
 - 1-2 tubular adenomas < 10mm:
 - Second surveillance colonoscopy: Repeat in 7-10 years
 - 3-4 tubular adenomas < 10mm:
 - Second surveillance colonoscopy: Repeat in 3-5 years
 - Adenoma ≥ 10mm in size:
 - Second surveillance colonoscopy: Repeat in 3 years
 - Adenoma with tubulovillous or villous history:
 - Second surveillance colonoscopy: Repeat in 3 years
 - Adenoma with high-grade dysplasia:
 - Second surveillance colonoscopy: Repeat in 3 years
 - 5-10 adenomas < 10mm:
 - Second surveillance colonoscopy: Repeat in 3 years

- ◆ **For any of the following scenarios on baseline colonoscopy/polypectomy:**
 - **Adenoma \geq 10mm**
 - **Adenoma with tubulovillous or villous pathology**
 - **Adenoma with high-grade dysplasia**
 - **5-10 adenomas < 10mm**
 - First surveillance colonoscopy findings:
 - Normal colonoscopy:
 - ◆ Second surveillance colonoscopy: Repeat in 5 years
 - 1-2 tubular adenomas < 10mm:
 - ◆ Second surveillance colonoscopy: Repeat in 5 years
 - 3-4 tubular adenomas < 10mm:
 - ◆ Second surveillance colonoscopy: Repeat in 3-5 years
 - Adenoma \geq 10mm:
 - ◆ Second surveillance colonoscopy: Repeat in 3 years
 - Adenoma with tubulovillous histology:
 - ◆ Second surveillance colonoscopy: Repeat in 3 years
 - Adenoma with high-grade dysplasia:
 - ◆ Second surveillance colonoscopy: Repeat in 3 years
 - 5-10 adenomas < 10mm:
 - ◆ Second surveillance colonoscopy: Repeat in 3 years
- ◆ **If baseline colonoscopy shows: Adenoma or SSP > 20mm with piecemeal resection:**
 - Second surveillance: 1 year from the first surveillance colonoscopy
 - Third surveillance: 3 years from the second surveillance colonoscopy
 - (Note: In this scenario, if any surveillance study after the initial polypectomy reveals local recurrence, subsequent examinations can be performed at 6 month intervals until there is no local recurrence. Once a clear resection site is documented, the next follow-up is at 1 year, and the subsequent follow-ups are at 3 year intervals.)
- ◆ **If baseline colonoscopy shows: Hyperplastic polyps \geq 10mm or SSPs (other than as noted above):**
 - No guidelines exist for second surveillance colonoscopy for these scenarios. Send to medical review. Evidence is lacking at the current time for additional serial surveillance recommendations.

COLON-4: Surveillance After Diagnosis of Colorectal Cancer¹¹

- If colonoscopy was not completed pre-operatively (e.g., because of an obstructing lesion)
 - ◆ Repeat colonoscopy 3-6 months post-surgery, for clearance
- For individuals who have undergone curative resection of either a colon or rectal cancer and had a successful peri-operative clearing colonoscopy at diagnosis or subsequently as noted above:
 - Colonoscopy one year after the surgery or one year after the clearing colonoscopy (assuming clearing colonoscopy occurred post-surgery)
 - Thereafter, repeat in 3 years (4 years from the surgery or clearing colonoscopy)
 - Repeat next colonoscopy in 5 years (9 years from the surgery or clearing colonoscopy)
 - Subsequent colonoscopies should occur at 5 year intervals.
- For individuals with Lynch Syndrome, see: **COLON-11: Genetic Syndromes**
- Additional surveillance of rectal cancer:
 - ◆ In addition to the above surveillance colonoscopies, a sigmoidoscopy or EUS can be performed at prescribed intervals.
 - These surveillance strategies are beyond the scope of the current guideline, which only references colonoscopy.
- See: **COLON-5: Inflammatory Bowel Disease** for surveillance of dysplasia

COLON-5: Inflammatory Bowel Disease

- Active inflammatory bowel disease⁴
 - ◆ For assessment of disease activity and/or treatment decisions, including assessment for mucosal healing on therapy
- Chronic inflammatory bowel disease⁴
 - ◆ Routine follow-up of inflammatory bowel disease in remission is not indicated except for cancer surveillance (see below)
- Post-surgery for Inflammatory Bowel Disease⁴
 - ◆ Evaluation of pouchitis, as clinically indicated
 - ◆ After partial colectomy or partial ileocolectomy
 - Examination of the neoterminal ileum 6-12 months after surgery to risk-stratify individuals who may be affected by endoscopic recurrence
- Screening and surveillance for dysplasia in established ulcerative colitis^{3,4,5}
 - ◆ Average risk individuals with ulcerative colitis
 - Begin screening 8 years after symptom onset (includes individuals with pancolitis, and left-sided colitis).
 - Continue surveillance colonoscopy every 1-3 years
 - Individuals with isolated ulcerative proctitis do not appear to be at increased risk of colon cancer. Thus, surveillance is not recommended in this group.
 - ◆ Elevated risk individuals with ulcerative colitis:
 - Begin annual surveillance beginning immediately upon diagnosis in the following high risk individuals:
 - Active inflammation
 - Anatomic abnormality such as a stricture or multiple pseudopolyps
 - Prior history of dysplasia
 - Family history of CRC in a first-degree relative
 - History of primary sclerosing cholangitis
 - ◆ If dysplasia is discovered or a lesion is present which needs follow-up evaluation:
 - If a polypoid or non-polypoid dysplastic lesion has been removed^{3,5}:
 - Colonoscopy surveillance at 1-6 months, then at 12 months, and then yearly
- Screening and surveillance for dysplasia in established Crohn's Disease of the colon:
 - ◆ Colonoscopy every 1-3 years in individuals with Crohn's Disease who have disease involving at least one-third of the colon, beginning 8 years after symptom onset

COLON-6: Irritable Bowel Syndrome

- Irritable Bowel Syndrome is a positive diagnosis, not a diagnosis of exclusion. It is characterized by abdominal pain associated with altered bowel habits, abdominal distension, and bloating over a period of 6 months. Subtypes include IBS-C (constipation-predominant), IBS-D (diarrhea-predominant), IBS-M (mixed), and unclassified IBS. Rome IV Criteria for the diagnosis of IBS are:
 - ◆ Recurrent abdominal pain, on average ≥ 1 day/week in the past 3 months, related to ≥ 2 of the following:
 - Defecation
 - Change in stool frequency
 - Change in stool appearance
- Colonoscopy indications:
 - ◆ The following laboratory studies should be performed prior to colonoscopy in the absence of alarm features:
 - CBC
 - CRP (C-reactive protein), fecal calprotectin, or fecal lactoferrin for non-constipated IBS
 - Serologic tests for celiac disease in non-constipated IBS
 - Stool analysis for giardia in IBS-D
 - ◆ If any one of the following alarm features are present, colonoscopy can be performed:
 - Positive family history of colorectal cancer (first-degree relative)
 - Rectal bleeding in the absence of documented bleeding hemorrhoids or anal fissures (e.g. positive stool occult blood, hematochezia. See: **COLON-9: GI Bleeding**)
 - Unintentional weight loss $\geq 5\%$ of body weight
 - Abdominal pain awakening individual at night-time
 - A change of pattern including frequent passage of stool during night-time
 - Iron-deficiency anemia as manifested by a low hematocrit and/or hemoglobin AND one of the following:
 - Low serum iron
 - Low serum ferritin
 - Elevated serum iron-binding capacity
 - Low serum transferrin saturation
 - Positive inflammatory markers as noted in the above laboratory examinations

COLON-7: Constipation

- Colonoscopy indicated:
 - ◆ For the following alarm symptoms:
 - Rectal bleeding
 - Note: the nature of rectal bleeding should be specific (e.g., bright red blood per rectum, melena, hematochezia, etc. See: **COLON-9: GI Bleeding**)
 - Heme-positive stool
 - Iron-deficiency anemia as manifested by a low hematocrit and/or hemoglobin AND one of the following::
 - Low serum iron
 - Low serum ferritin
 - Elevated serum iron-binding capacity
 - Low serum transferrin saturation
 - Weight loss (>5% loss of body weight)
 - Individuals ≥ 45 years who have not previously had colon cancer screening via colonoscopy
 - For dilation of benign colon strictures or creation of percutaneous cecostomy when clinically appropriate
 - Note: the nature of the stricture should be specified (e.g., anastomotic stricture in the sigmoid)
 - In selected individuals, if there is a documented concern for obstruction secondary to cancer, stricture, or extrinsic compression
 - If surgery is being considered for the treatment of constipation

Background and Supporting Information

- As per ASGE guidelines, colonoscopy is generally NOT performed for the initial evaluation of individuals presenting with symptoms of chronic constipation in the absence of alarm features or suspicion of organic disease. It should be noted that in a retrospective review of 41,775 colonoscopies performed for average-risk CRC screening, constipation only, or constipation with another indication, individuals with constipation alone (as opposed to constipation with another indication) had a lower risk of significant findings than individuals undergoing colonoscopy for average risk screening.³⁰ In general, the yield of colonoscopy for isolated constipation is comparable to that of asymptomatic individuals undergoing colonoscopy for routine CRC screening.

COLON-8: Diarrhea

- Chronic diarrhea (≥ 28 days)^{8,22}
 - ◆ Prior to colonoscopy:
 - Fecal calprotectin or lactoferrin to screen for Inflammatory Bowel Disease.
 - Giardia antigen test or PCR for Giardia.
 - Testing for celiac with IgA tissue transglutaminase (A positive test would warrant confirmation by duodenal biopsy). The use of IgG-tTG or a test for IgG deaminated gliadin peptides can be considered for IgA-deficient individuals.
 - ◆ If the diagnosis is inconclusive or suggestive of IBD after the above studies, colonoscopy can be approved.
- Acute diarrhea⁸ (< 28 days):
 - ◆ Immunocompetent individuals:
 - Stool and laboratory tests, including tests for the presence of microbial pathogens are the initial studies for the evaluation of clinical scenarios suggestive of infectious diarrhea
 - Colonoscopy is generally not indicated for the initial evaluation of acute diarrhea in this setting, unless:
 - Findings on sigmoidoscopy are inconclusive
 - Results should be provided
 - Symptoms persist and fail to respond to empirical therapy
 - Type of therapy should be provided
 - The diagnosis is inconclusive after routine blood and stool studies
 - Results of these studies should be provided
 - There is significant blood loss
 - Nature of blood loss should be specified
 - ◆ Immunocompromised Individuals:
 - Stool testing for pathogens is the first-line evaluation
 - Colonoscopy can be considered if stool studies fail to reveal a cause and symptoms persist. In addition, cytomegalovirus infection (CMV) diagnosed by PCR, viral culture, or positive serology may not be indicative of tissue-invasive disease and endoscopic biopsy may be needed.

Background and Supporting Information

- In the immunocompromised individual (e.g., HIV) evidence indicates that colonoscopy has a higher diagnostic yield than sigmoidoscopy.

COLON-9: GI Bleeding

- History of rectal bleeding
 - ◆ The nature of the rectal bleeding should be specified (e.g., bright red blood per rectum, melena, hematochezia, etc.)
 - For symptoms suggesting outlet-type bleeding (e.g., scant hematochezia, blood on toilet paper, small amount of blood on outside of stool)
 - Individuals age less than 40 years, colonoscopy is indicated when:
 - Flexible sigmoidoscopy does not reveal a local source of bleeding such as hemorrhoids or anal fissure.
 - Findings on sigmoidoscopy suggest a need for further evaluation (e.g., inflammatory bowel disease, adenomatous polyp, etc.)
 - In the presence of alarm symptoms of weight loss or bowel habit changes, or if criteria for colonoscopy is met by other guidelines (e.g. iron deficiency anemia, etc.)
 - For elevated risk individuals with family history of colorectal polyps or cancer or other genetic predisposition to colonic cancer
 - Individuals age 40 years or older, colonoscopy is indicated
 - For confirmed positive occult blood, melena, or hematochezia not suggestive of outlet-type bleeding
 - Colonoscopy is indicated
- Iron deficiency anemia as manifested by a low hematocrit and/or hemoglobin AND one of the following::
 - ◆ Low serum iron
 - ◆ Low serum ferritin
 - ◆ Elevated serum iron-binding capacity
 - ◆ Low serum transferrin saturation

COLON-10: Abdominal Pain

- Isolated abdominal pain with or without constipation in the absence of bleeding (i.e., no history of rectal bleeding, negative stool occult blood, and normal Hgb).¹⁵
- With respect to colonoscopy indications, isolated abdominal pain is usually localized to the lower abdomen. In general, isolated abdominal pain is a poor indication for colonoscopy but can be considered in individual cases:
 - ◆ In individuals ≥ 45 years of age, colonoscopy is indicated if a screening colonoscopy (or a diagnostic colonoscopy for another indication) has not yet been performed.
 - A recent negative colonoscopy for colon cancer screening or for other investigative purposes should mitigate the need for another colonoscopy for isolated abdominal pain or irritable bowel-type symptomatology in the absence of new alarm symptoms.
 - See alarm symptoms under **COLON-6: Irritable Bowel Syndrome** for indications for colonoscopy in this setting.
 - ◆ In individuals < 45 years of age, see alarm symptoms under **COLON-6: Irritable Bowel Syndrome** for colonoscopy indications.

COLON-11: Unexplained Weight Loss

- Unexplained weight loss of > 5% body weight
 - ◆ Colonoscopy as requested

COLON-12: Abnormal Radiologic Study

- Abnormal radiologic studies or other examinations indicating colorectal pathology⁶:
 - ◆ Colonoscopy as requested to assess the abnormality as indicated
 - The nature of the abnormality must be documented by description of the radiologic finding (e.g., colon wall thickening on CT scan)

COLON-13: Repeat Colonoscopy for Inadequate Preparation

- Inadequate preparation on initial colonoscopy for screening or surveillance:
 - ◆ For a BBPS (Boston Bowel Prep Scale) score of 2 or 3 in all segments of the colon:
 - Repeat examination as per screening or surveillance guidelines
 - ◆ For BBPS score of 0 or 1 in any segment of the colon:
 - Repeat examination as per the endoscopist
 - ◆ For cases in which the BBPS score is not available:
 - Repeat examination as per the endoscopist with documentation from prior colonoscopy report indicating the inadequacy of the preparation and the need for earlier-than-usual follow-up.

COLON-14: Therapeutic Colonoscopy

- Removal of a foreign body⁶
 - ◆ The nature of the suspected foreign body should be provided (e.g., battery, etc.)
- Treatment of a known bleeding source (e.g., radiation proctitis, arteriovenous malformation, etc.)
- Excision of a known polyp⁶
 - ◆ This would apply to a known polyp not previously resected. Documentation of the nature of the retained polyp should be provided (e.g., large polyp for which endoscopic mucosal resection is being planned)
 - ◆ For colon polyp surveillance, see: **COLON-3: Surveillance after Polypectomy**
- Decompression of acute nontoxic megacolon or sigmoid volvulus⁶
 - ◆ Documentation of the history should be provided
- Balloon-dilation of stenotic lesions⁶
 - ◆ The nature of the stenosis should be specified (e.g., dilation of an anastomotic sigmoid stricture)
- Palliative treatment of stenosing or bleeding neoplasms⁶
 - ◆ The type of neoplasm and location should be specified
- Marking a neoplasm for localization⁶
 - ◆ The type of neoplasm and location should be specified
- Intra-operative colonoscopy for site identification at time of surgery⁶
 - ◆ The nature of the planned surgical procedure should be specified (e.g., surgical treatment of a polypoid lesion)

COLON-15: Metastatic Cancer of Unknown Primary Site

- Metastatic adenocarcinoma of unknown primary site when, in the opinion of the treating physician responsible for oncology care, the results will not alter management.
 - ◆ Colonoscopy is NOT indicated⁶

COLON-16: Colonoscopy Via Stoma

- Colonoscopy via stoma can be performed for any of the above indications, and in addition¹³:
 - ◆ To evaluate stoma complications (e.g., hernia, retraction, prolapse, stenosis, fistula, etc.)

COLON-17: Genetic Syndromes

- Lynch Syndrome (NOTE: Screening colonoscopy begins at the stated age as indicated below, or 5 years before the youngest age of diagnosis of colorectal cancer in an affected family member, whichever occurs first)
 - ◆ MLH1/MSH2 Mutation:
 - Annual colonoscopy beginning at age 20
 - ◆ MSH6/PMS2 Mutation:
 - Annual colonoscopy beginning at age 25
 - ◆ Deletions of upstream EpCAM gene⁵²⁻⁵⁴:
 - Annual colonoscopy beginning at age 20
- Polyposis Syndromes
 - ◆ FAP (Familial Adenomatous Polyposis, confirmed by a mutation in the APC-Adenomatous Polyposis Coli gene):
 - Annual colonoscopy beginning at age 10
 - ◆ Attenuated FAP:
 - Annual colonoscopy beginning at age 18
 - ◆ MUTYH-associated polyposis:
 - Annual colonoscopy beginning at age 25
 - ◆ Juvenile Polyposis Syndrome (defined as individuals with 5 or more juvenile polyps in the colorectum or any juvenile polyps in other parts of the GI tract, or evidence of SMAD4 or BMPRI1A mutations)
 - Colonoscopy at age 12. If polyps are present, repeat yearly. If no polyps, repeat every 2 years.
 - ◆ Serrated Polyposis Syndrome:
 - Colonoscopy yearly
 - Criteria for diagnosis - at least one of the following:
 - At least 5 serrated polyps proximal to the sigmoid colon with ≥ 2 of these being > 10 mm
 - Any number of serrated polyps proximal to the sigmoid colon in an individual who has a first-degree relative with serrated polyposis
 - > 20 serrated polyps of any size, distributed throughout the colon

- ◆ Puetz-Jeghers Syndrome (individuals with perioral or buccal pigmentation and/or 2 or more histologically characteristic hamartomatous polyps, or family history of PJS, or STK11 mutations):
 - Colonoscopy at age 8. If polyps are present, can be repeated every 3 years. If no polyps are discovered, repeat at age 18, then every 3 years, or earlier if any symptoms occur.
- ◆ Cowden Syndrome (individuals with PTEN gene mutations, history of multiple gastrointestinal hamartomas or ganglioneuromas):
 - Colonoscopy beginning at age 15. Can be repeated every 2 years if no polyps are discovered. If polyps are found, repeat as requested.
- ◆ Family Colon Cancer X Syndrome (individuals who meet Amsterdam I criteria* but lack genetic mutation findings):
 - Colonoscopy every 3 years beginning 10 years before the age at diagnosis of the youngest affected relative.
- ◆ Hereditary Gastric Cancer (Hereditary Diffuse Gastric Cancer-HDGC Syndrome):
 - Colonoscopy beginning at age 40. Interval has not been established.
- ◆ BMMRD (Biallelic Mismatch Repair Deficiency)
 - Colonoscopy annually beginning at age 6. Once polyps are found, colonoscopy is recommended every 6 months.
 - All heterozygous family members are eligible for Lynch Syndrome Screening (See above for Lynch Syndrome)

Background and Supporting Information

- Lynch syndrome is caused by germline variants in one of the DNA mismatch repair (MMR) genes (MLH1, MSH2, MSH6, PMS2) or by deletions in the epithelial cell adhesion molecule gene (EpCAM). This increases susceptibility to colorectal, endometrial, and other tumors.
- High Risk Screening:
 - ◆ If there is no information regarding the pathology of the first-degree relative's polyp, it cannot be assumed that the adenomas or polyps were advanced, unless surgery was required to remove the polyp.
- *Amsterdam I Criteria
 - ◆ At least three relatives with colorectal cancer (CRC)
 - ◆ All of the following criteria should be present:
 - One should be a first-degree relative of the other two
 - At least two successive generations must be affected
 - At least one of the relative with CRC must have received the diagnosis before the age of 50 years
 - Familial adenomatous polyposis should be excluded
 - Tumors should be verified by pathologic examination

COLON-18: Colonoscopy After Noninvasive Testing

- Colonoscopy is indicated after an abnormal result on a noninvasive colon cancer screening test (e.g., fecal occult blood test (FOBT), fecal immunochemical test (FIT), serum-based screening test, or stool-based DNA test such as Cologuard®)^{46, 48-51}
- Colonoscopy is indicated if the individual had a prior negative screening colonoscopy, but later received an abnormal result on a noninvasive colon cancer screening test (as listed above)⁴⁷

References

1. Rex DK, Boland CR, Dominitz JA, et al. Colorectal Cancer Screening: Recommendations for Physicians and Patients from the U.S. Multi-Society Task Force on Colorectal Cancer. *The American Journal of Gastroenterology*. 2017;112(7):1016-1030. doi:10.1038/ajg.2017.174
2. Giardiello FM, Allen JI, Axilbund JE, et al. Guidelines on Genetic Evaluation and Management of Lynch Syndrome: A Consensus Statement by the US Multi-Society Task Force on Colorectal Cancer. *The American Journal of Gastroenterology*. 2014;109(8):1159-1179. doi:10.1038/ajg.2014.186
3. Laine L, Kaltenbach T, Barkun A, et al. SCENIC international consensus statement on surveillance and management of dysplasia in inflammatory bowel disease. *Gastrointestinal Endoscopy*. 2015;81(3). doi:10.1016/j.gie.2014.12.009
4. Shergill AK, Lightdale JR, Bruining DH, et al. The role of endoscopy in inflammatory bowel disease. *Gastrointestinal Endoscopy*. 2015;81(5). doi:10.1016/j.gie.2014.10.030
5. Farraye FA, Odze RD, Eaden J, Itzkowitz SH. AGA Medical Position Statement on the Diagnosis and Management of Colorectal Neoplasia in Inflammatory Bowel Disease. *Gastroenterology*. 2010;138(2):738-745. doi:10.1053/j.gastro.2009.12.037
6. Early DS, Ben-Menachem T, Decker GA, et al. Appropriate use of GI endoscopy. *Gastrointestinal Endoscopy*. 2012;75(6):1127-1131. doi:10.1016/j.gie.2012.01.011
7. Cash BD, Acosta RD, Chandrasekhara V, et al. The role of endoscopy in the management of constipation. *Gastrointestinal Endoscopy*. 2014;80(4):563-565. doi:10.1016/j.gie.2014.06.018
8. Shen B, Khan K, Ikenberry SO, et al. The role of endoscopy in the management of patients with diarrhea. *Gastrointestinal Endoscopy*. 2010;71(6):887-892. doi:10.1016/j.gie.2009.11.025
9. Short MW, Layton MC, Teer BN, et al. Colorectal Cancer Screening and Surveillance. *Am Fam Physician*. 2015. 91(2): 93-100.
10. Lieberman DA, Rex DK, Winawer SJ, Giardiello FM, Johnson DA, Levin TR. Guidelines for Colonoscopy Surveillance After Screening and Polypectomy: A Consensus Update by the US Multi-Society Task Force on Colorectal Cancer. *Gastroenterology*. 2012;143(3):844-857. doi:10.1053/j.gastro.2012.06.001
11. Kahi CJ, Boland CR, Dominitz JA, et al. Colonoscopy Surveillance After Colorectal Cancer Resection: Recommendations of the US Multi-Society Task Force on Colorectal Cancer. *Gastroenterology*. 2016;150(3). doi:10.1053/j.gastro.2016.01.001
12. Lichtenstein GR, Loftus EV, Isaacs KL, Regueiro MD, Gerson LB, Sands BE. ACG Clinical Guideline: Management of Crohn's Disease in Adults. *The American Journal of Gastroenterology*. 2018;113(4):481-517. doi:10.1038/ajg.2018.27
13. Sinh P, Shen B. Endoscopic Evaluation of Surgically Altered Bowel in Patients with Inflammatory Bowel Diseases. *Inflammatory Bowel Diseases*. 2015;1. doi:10.1097/mib.0000000000000357.
14. Minoli G, Meucci G, Bortoli A, Garripoli A, Gullotta R, et al. The ASGE guidelines for the appropriate use of colonoscopy in an open access system. *Gastrointestinal Endoscopy*, 2000; 52(1). doi:10.1067/mge.2000.106683
15. Wayne J, Rex D, Williams C. *Colonoscopy Principles and Practice*. 2nd Ed. 2009.
16. Syngal S, Brand RE, Church JM, Giardiello FM, Hampel HL, Burt RW. ACG clinical guideline: Genetic testing and management of hereditary gastrointestinal cancer syndromes. *Am J Gastroenterology*. 2015;110(2):223-262. doi:10.1038/ajg.2014.435.
17. Rubenstein JH, Enns R, Heidelbaugh J, et al. American Gastroenterological Association Institute guideline on the diagnosis and management of Lynch syndrome. *Gastroenterology*. 2015;149(3):777-782. doi:10.1053/j.gastro.2015.07.036.
18. Durno C, Boland CR, Cohen S, et al. Recommendations on surveillance and management of biallelic mismatch repair deficiency (BMMRD) syndrome: A consensus statement by the U.S. Multi-Society Task Force on Colorectal Cancer. *Gastroenterology*. 2017;152(6):1605-1614. doi:10.1053/j.gastro.2017.02.011.
19. Pimentel M. Evidence-based management of Irritable Bowel Syndrome with diarrhea. *Am. J. of Manag Care*. 2018;24(3):S35-S46.

20. Moayyedi P, Andrews CN, MacQueen G, et. al. Canadian Association of Gastroenterology clinical practice guideline for the management of Irritable Bowel Syndrome (IBS). *Journal of the Canadian Association of Gastroenterology*. 2019;2(1):6-29. doi:10.1093/jcag/gwy071.
21. Quigley EMM, Fried M, Gwee K, et. al. Irritable Bowel Syndrome: a global perspective. *World Gastroenterology Organisation Global Guidelines*. 2015.
22. Smalley W, Falck-Ytter C, Carrasco-Labra A, Wani S, Lytvyn L, Falck-Ytter Y. AGA clinical practice guidelines on the laboratory evaluation of functional diarrhea and diarrhea-predominant Irritable Bowel Syndrome in adults (IBS-D). *Gastroenterology*. 2019;157(3):851-854. doi:10.1053/j.gastro.2019.07.004.
23. Ford AC, Moayyedi P, Chey WD, et. al. American College of Gastroenterology monograph on the management of Irritable Bowel Syndrome and chronic idiopathic constipation. *Am J Gastroenterol*. 2018;113:1-18. doi:10.1038/s41395-018-0084-x.
24. Ford AC, Lacy BE, Talley NJ. Irritable Bowel Syndrome. *N Engl J Med*. 2017;376(26):2566-2578. doi:10.1056/NEJMra1607547.
25. Sultan S, Malhotra A. Irritable Bowel Syndrome. *Ann Intern Med*. 2017;166(11):ITC81-ITC96. doi:10.7326/AITC201706060.
26. Brandt LJ, Chey WD, Foxx-Orenstein AE, et. al. An evidence-based position statement on the management of Irritable Bowel Syndrome. *Am J Gastroenterol*. 2009;104:S1-S35. doi:10.1038/ajg.2008.122.
27. Kaltenback T, Anderson JC, Burke CA, et. al. Endoscopic removal of colorectal lesions-recommendations by the US Multi-Society Task Force on Colorectal Cancer. *Gastroenterology*. 2020;158(4):1095-1129. doi:10.1053/j.gastro.2019.12.018.
28. Gupta S, Lieberman D, Anderson JC, et. al. Recommendations for follow-up after colonoscopy and polypectomy: a consensus update by the US Multi-Society Task Force on Colorectal Cancer. *Gastroenterology*. 2020;91(3):463-485. doi:10.1016/j.gie.2020.01.014.
29. Riddle MS, DuPont HL, Connor BA. ACG clinical guideline: diagnosis, treatment, and prevention of acute diarrheal infections in adults. *Am J Gastroenterol*. 2016;111(5):602-622. doi:10.1038/ajg.2016.126.
30. Gupta M, Holub J, Knigge K, Eisen G. Constipation is not associated with an increased risk of findings on colonoscopy: Results from a national endoscopy consortium. *Endoscopy*. 2010;42(3):208-212. doi:10.1055/s-0029-1243843.
31. Clark BT, Protiva P, Nagar A, et. al. Quantification of adequate bowel preparation for screening or surveillance colonoscopy in men. *Gastroenterology*. 2016;150:396-405. doi:10.1053/j.gastro.2015.09.041.
32. Menees SB, Elliott E, Govani S, et. al. The impact of bowel cleansing on follow-up recommendations in average-risk patients with a normal colonoscopy. *Am J Gastroenterol*. 2014;109(2):154-148. doi:10.1038/ajg.2013.243.
33. Dhese E, Bersherdas K. colonoscopy for abdominal pain: is it worth performing? *Gut*. 2016;65:A225-226. doi:10.1136/gutjnl-2016-312388.422.
34. Chey WD, Nojkov B, Rubenstein JH, Dobhan RR, Greenson JK, Cash BD. Yield of colonoscopy in patients with non-constipated Irritable Bowel Syndrome: results from a prospective, controlled US trial. *Am J Gastroenterol*. 2010;105(4):859-865. doi:10.1038/ajg.2010.55.
35. Nunn M, Williams G, Gruchy SE. Evaluating the diagnostic yield of patients presenting for colonoscopy with isolated abdominal pain. *Journal of the Canadian Association of Gastroenterology*. 2018;1(1):90-91. doi:10.1093/jcag/gwy008.054.
36. Black TP, Manolakis CS, Di Palma JA. "Red flag" evaluation yield in Irritable Bowel Syndrome. *J Gastrointest Liver Dis*. 2012;21(2):153-156.
37. Kueh SH, Zhou L, Walmsley RS. The diagnostic yield of colonoscopy in patients with isolated abdominal pain. *N Z Med J*. 2013;13:126(1382):36-44.
38. Bharucha AE, Dorn SD, Lembo A, Pressman A. American Gastroenterological Association medical position statement on constipation. *Gastroenterology*. 2013;144(1):P211-217. doi:10.1053/j.gastro.2012.10.029.
39. Telford J. Inappropriate uses of colonoscopy. *Gastroenterol Hepatol*. 2012;8(5):342-344.
40. Pasha SF, Shergill A, Acosta RD, et. al. The role of endoscopy in the patient with lower GI bleeding. *Gastrointestinal Endoscopy*. 2014;79(6):875-885.
41. Koh FH, Seah A, Chan D, Ng J, Tan KK. Is colonoscopy indicated in young patients with hematochezia. *Gastrointest Tumors*. 2017;4:90-95. doi:10.1159/000481686.
42. Marderstein EL, Church JM. Classic "outlet" rectal bleeding does not require full colonoscopy to exclude significant pathology. *Diseases of the Colon & Rectum*. 2008;51:202-206.
43. Shaukat A, Kahi CJ, Burke CA, Rabeneck L, Sauer BG, Rex, D. ACG clinical guidelines: colorectal cancer screening 2021. *Am J Gastroenterol*. 2021;116(3):458-479. doi:10.14309/ajg.0000000000001122.
44. Davidson KW, Barry MJ, Mangione CM, et. al. Screening for colorectal cancer. *US Preventative Services Task Force recommendation statement*. *JAMA*. 2021;325(19):1965-1977. doi:10.1001/jama.2021.6238.
45. Yang J, Gurudu SR, Koptiuch C, et. al. American Society for Gastrointestinal Endoscopy guideline on the role of endoscopy in familial adenomatous polyposis syndromes. *Gastrointest Endosc*. 2020;(91)5:963-982. doi:10.1016/j.gie.2020.01.028.
46. Ebner DW, Eckmann JD, Burger KN, et. al. Detection of postcolonoscopy colorectal neoplasia by multi-target stool DNA. *Clin Transl Gastroenterol*. 2021;12(6):e00375. doi:10.14309/ctg.0000000000000375.

47. Eckmann JD, Ebner DW, Bering J, et. al. Multitarget stool DNA screening in clinical practice: high positive predictive value for colorectal neoplasia regardless of exposure to previous colonoscopy. *Am J Gastroenterol.* 2020;115(4):608-615. doi:10.14309/ajg.0000000000000546.
48. Anderson JC, Robinson CM, Hisey WM, et. al. Colorectal neoplasia detection in individual with positive Multitarget stool DNA tests: data from the New Hampshire colonoscopy registry. *J Clin Gastroenterol.* 2022;56(5):419-425. doi:10.1097/MCG.0000000000001554.
49. Krigel A, Wan DW. Colonoscopy after a positive stool-based test for colon cancer screening: moving toward a better understanding of what to expect. *Cancer Prev Res (Phila).* 2022;15(7):417-418. doi:10.1158/1940-6207.CAPR-22-0213.
50. Zorzi M, Battagello J, Selby K, et. al. Non-compliance with colonoscopy after a positive faecal immunochemical test doubles the risk of dying from colorectal cancer. *Gut.* 2022;71(3):561-567. doi:10.1136/gutjnl-2020-322192.
51. Chung SS, Ali SI, Cash BD. The present and future of colorectal cancer screening. *Gastroenterol Hepatol.* 2022;18(11):646-653.
52. Cini G, Quaia M, Canzonieri V, et. al. Toward a better definition of EPCAM deletions in Lynch syndrome: report of new variants in Italy and the associated molecular phenotype. *Mol Genet Genomic Med.* 2019;7(5). doi:10.1002/mgg3.587.
53. Pathak SJ, Mueller JL, Okamoto K, et. al. EPCAM mutation update: variants associated with congenital tufting enteropathy and Lynch syndrome. *Human mutation.* 2019;40:142-161. doi:10.1002/humu.23688.
54. Hosono H, Ohishi T, Tai J, et. al. The anti-epithelial cell adhesion molecule (EpCAM) monoclonal antibody EpMab-16 exerts antitumor activity in a mouse model of colorectal adenocarcinoma. *Oncol Lett.* 2020;20(6):383. doi:10.3892/ol.2020.12246.