Esophagogastroduodenoscopy (EGD), UGI Endoscopy

MCG Health
Ambulatory Care
27th Edition

ACG: A-0203 (AC)
Link to Codes

Clinical Indications for Procedure

- Esophagogastroduodenoscopy (UGI endoscopy) may be indicated for **1 or more** of the following(1):
  - Achalasia (eg, onabotulinumtoxinA injection, balloon dilation)(3)(4)(5)(6)N
  - Atypical chest pain, after cardiac disease has been ruled out(13)(14)N
  - Barrett esophagus[A] and **1 or more** of the following(4)(17)(21)(22)(23):N
    - Barrett esophagus indefinite for dysplasia on previous endoscopy: repeat UGI endoscopy at 3 to 6 months, then annually if repeat UGI endoscopy is indefinite for dysplasia
    - Barrett esophagus with low-grade dysplasia on previous endoscopy, managed with surveillance: repeat UGI endoscopy at 6 months to reconfirm diagnosis, at 12 months after diagnosis, and then annually(30)
    - Barrett esophagus, nondysplastic (metaplastic columnar or glandular epithelium) on previous endoscopy: repeat UGI endoscopy at 3 to 5 years
    - Endoscopic resection and/or ablation (ie, cryoablation, radiofrequency, or photodynamic therapy) for identification of dysplasia or treatment of positive (ie, low-grade or high-grade) dysplasia associated with Barrett esophagus(20)(31)(32)(33)
  - Cancer, known or suspected, and **1 or more** of the following:
    - Cancer, and need for evaluation and treatment, as indicated by **1 or more** of the following(17)(34)(35):N
      - Ablation of polyp, tumor, or other lesions(39)(40)
      - Dilation of malignant stricture(41)
      - Esophageal or esophagogastric junction cancer, and need for **1 or more** of the following:
        - Preoperative evaluation or staging with biopsies, as indicated
        - Endoscopic mucosal resection or submucosal dissection of esophageal or esophagogastric junction cancer (high-grade dysplasia (Tis), carcinoma limited to lamina propria or muscularis mucosa (T1a), or superficial submucosa carcinoma (T1b) without lymphovascular invasion)(33)(36)(42)(43)(44)
        - Assessment of response or surveillance after chemoradiation for esophageal or esophagogastric junction cancer
      - Gastric cancer, and need for **1 or more** of the following(45):
        - Preoperative evaluation or staging with biopsies, as indicated
        - Endoscopic mucosal resection or submucosal dissection of gastric carcinoma (carcinoma in situ (Tis) or well-differentiated or moderately differentiated carcinoma confined to mucosa (T1a) without evidence of lymph node metastases or lymphovascular invasion)(46)(47)(48)(49)(50)
      - Gastrointestinal neuroendocrine tumor, and endoscopic resection needed(51)(52)(53)
      - Lymphoma (eg, MALT (mucosa-associated lymphoid tissue) lymphoma), and need for preoperative evaluation or staging with biopsies, as indicated(50)(54)
      - Stent placement for obstruction due to intrinsic or extrinsic compression(55)(56)(57)(58)(59)
      - Tumor debulking or ablation (eg, electrocautery, laser, chemical)(60)
    - Cancer screening[B] in patient at increased risk, as indicated by **1 or more** of the following(17)(34)(63):N
      - High-risk family history, as indicated by **1 or more** of the following:
        - Family member with Lynch syndrome (ie, hereditary nonpolyposis colorectal cancer): screening is individualized.[C](66)(68)
        - Family member with Peutz-Jeghers syndrome[D] and **ALL** of the following(70)(71):

        - Age 8 years or older(72)
        - No UGI endoscopy in past 2 years
    - Family member with tylosis[E]: screening frequency is individualized starting at age 20 years.
    - Sibling with MUTYH-associated polyposis, and individual not tested for known MUTYH mutation, and **ALL** of the following(66):
        - Age 30 years or older
        - No previous UGI endoscopy for screening
- High-risk personal history, as indicated by **1 or more** of the following:
    - History of achalasia: screening frequency is individualized.(65)(73)
    - History of autoimmune gastritis, atrophic gastritis, or pernicious anemia: single endoscopy is indicated.(52)
    - History of caustic injury to esophagus: screening frequency is individualized.(65)
    - History of classical or attenuated familial adenomatous polyposis: screening starting at age 20 to 25 years (baseline endoscopy may be offered at earlier age if colectomy performed before age 20 years)(66)(70)(72)(74)
    - History of gastric carcinoid tumor: screening frequency is individualized.(52)(53)(75)
    - History of gastric resection for benign or malignant disease, as indicated by **1 or more** of the following:
        - Development of any new UGI symptoms
        - Routine follow-up at 15 to 20 years after partial gastric resection for benign gastric or duodenal ulcer, with multiple biopsies from anastomosis and gastric remnant(63)
    - Personal history of hereditary cancer predisposition syndrome associated with esophageal cancer (eg, Bloom syndrome, familial Barrett esophagus, Fanconi anemia, tylosis)(17)
    - Personal history of hereditary diffuse gastric cancer syndrome: screening every 6 months for mutation carrier who does not elect to undergo gastrectomy(76)
    - Personal history of homozygous MUTYH-associated polyposis mutations and **ALL** of the following(69):
        - Age 30 years or older
        - No UGI endoscopy in past year
    - Personal history of juvenile polyposis syndrome[F] and **ALL** of the following(66)(69)(77):
        - Appropriate at-risk age, as indicated by **1 or more** of the following:
            - Age 12 years or older
            - Age younger than 12 years and symptomatic (eg, GI bleed, iron deficiency anemia)
        - No UGI endoscopy in past year
    - Personal history of Li-Fraumeni syndrome[G] and **ALL** of the following(78)(79):
        - Appropriate at-risk age, as indicated by **1 or more** of the following:
            - Age 25 years or older
            - Age is 5 years younger than earliest age of diagnosis of gastric cancer in family, or older.
        - No UGI endoscopy in past 2 years
    - Personal history of Lynch syndrome (ie, hereditary nonpolyposis colorectal cancer): screening is individualized.[C](66)(67)(80)(81)(82)
    - Personal history of Peutz-Jeghers syndrome[D] and **ALL** of the following(69)(77):
        - Age 8 years or older
        - No UGI endoscopy in past year

− Cancer surveillance,[B] as indicated by **1 or more** of the following:N

- Patient with prior nonmalignant gastrointestinal lesion removal, as indicated by **1 or more** of the following:
    - Barrett esophagus, nondysplastic (metaplastic columnar or glandular epithelium), on previous endoscopy: UGI endoscopy with 4-quadrant biopsy every 3 to 5 years(19)(29)(83)
    - Barrett esophagus with low-grade dysplasia on previous endoscopy, managed with endoscopic eradication therapy: repeat UGI endoscopy intervals individualized (every 6 months to 3 years)[H](23)(30)
    - Classical or attenuated familial adenomatous polyposis syndrome: subsequent surveillance intervals based on modified Spigelman score of UGI endoscopy duodenal polyposis findings, as indicated by **1 or more** of the following(66):
        - Spigelman stage 0 and no UGI endoscopy in past 3 years
        - Spigelman stage I and no UGI endoscopy in past 2 years
        - Spigelman stage II and no UGI endoscopy in past 1 year
        - Spigelman stage III and no UGI endoscopy in past 6 months
        - Spigelman stage IV and no UGI endoscopy in past 3 months[I]
    - Colonic adenomatous polyposis of unknown etiology[J]: subsequent surveillance intervals based on modified Spigelman score of UGI endoscopy duodenal polyposis findings, as indicated by **1 or more** of the following(66):
        - Spigelman stage 0 and no UGI endoscopy in past 3 years
        - Spigelman stage I and no UGI endoscopy in past 2 years
        - Spigelman stage II and no UGI endoscopy in past 1 year
        - Spigelman stage III and no UGI endoscopy in past 6 months

        - Spigelman stage IV and no UGI endoscopy in past 3 months[I]
    - History of gastric adenomatous polyps: status post gastric adenomatous polyp removal, and no UGI endoscopy in past 1 year; if subsequent UGI endoscopy negative, then surveillance at 3-year to 5-year intervals(63)
    - Juvenile polyposis syndrome,[F] and no UGI endoscopy in past 1 year(69)(77)
    - MUTYH-associated polyposis: subsequent surveillance intervals based on modified Spigelman score of UGI endoscopy duodenal polyposis findings, as indicated by **1 or more** of the following(66)(69)(70):
        - Spigelman stage 0 and no UGI endoscopy in past 4 years
        - Spigelman stage I and no UGI endoscopy in past 2 years
        - Spigelman stage II and no UGI endoscopy in past 1 year
        - Spigelman stage III and no UGI endoscopy in past 6 months
        - Spigelman stage IV and no UGI endoscopy in past 3 months[I]
    - Personal history of Lynch syndrome (ie, hereditary nonpolyposis colorectal cancer): screening is individualized.[C](66)(67)(80)(81)(82)
    - Peutz-Jeghers syndrome,[D] and no UGI endoscopy in past 1 year(69)(77)
- Surveillance after esophageal or gastric cancer treatment with curative intent, as indicated by **1 or more** of the following:
    - Esophageal or esophagogastric junction cancer treated with curative intent (eg, endoscopic resection and/or ablation, esophagectomy, chemoradiation): every 3 to 6 months for first 2 years, then annually(17)(84)(85)
    - Gastric cancer treated with curative intent, as indicated by **1 or more** of the following(34):
        - High-grade dysplasia (Tis) status post successful endoscopic resection: every 6 months for year 1, then annually for 3 years
        - Carcinoma limited to lamina propria or muscularis mucosa (T1a) status post endoscopic resection: every 6 months for year 1, then annually for up to 5 years
        - Carcinoma limited to lamina propria or muscularis mucosa (T1a) status post surgical resection: as clinically indicated
        - Superficial submucosa carcinoma (T1b) without lymphovascular invasion status post surgical resection: as clinically indicated
        - Gastric MALT lymphoma after primary treatment (eg, *Helicobacter pylori* eradication): UGI endoscopy with biopsy every 3 months for 5 years, then annually(54)(86)
    - Gastrointestinal neuroendocrine tumor treatment with curative intent: frequency is individualized based on tumor burden.(51)(52)

- Caustic ingestion(73)(87)(88)(89)(90)N
- Crohn disease and suspected involvement of **1 or more** of the following(93)(94)(95)(96)(97):N
    - Esophagus
    - Stomach
    - Duodenum(98)
- Duodenal disease, suspected, and need for examination and biopsy (eg, celiac disease, neoplastic lesion)(4)(99)(100)(101)N
- Dyspepsia and **1 or more** of the following(2)(104):N
    - Age 60 years or older(108)
    - Dysphagia or odynophagia[K]
    - Eosinophilic esophagitis, suspected, and need for biopsy(88)(110)(111)(112)
    - Failure of medical therapy (eg, poor response to H2-receptor antagonists, proton pump inhibitors)
    - Family history of UGI cancer in first-degree relative[L](39)(114)
    - History of gastric surgery
    - Involuntary weight loss since onset of symptoms
    - Iron deficiency anemia
    - Medication-induced enterocolitis, suspected(105)(106)
    - Persistence for 3 months or longer
    - Planned bariatric surgery(115)(116)(117)(118)
    - Use of NSAIDs
    - Vomiting(39)
- Dysphagia and **1 or more** of the following(2)(41)(109):N
    - Bleeding associated with any swallowing problem
    - Eosinophilic esophagitis, suspected, and need for biopsy(88)(110)(111)(112)
    - Malignant compression or obstruction and need for stent placement(17)(123)(124)(125)
    - Mechanical obstruction, suspected, due to clinical signs, patient history, or results of radiographic testing (eg, Schatzki ring, vascular ring, esophageal stricture, ingested foreign body, gastric outlet obstruction)(92)(121)(126)(127)(128)(129)
    - Planned bariatric surgery(115)(116)(117)(118)
    - Swallowing problems that are persistent or recurrent(14)(60)
    - Symptoms after bariatric surgery(115)(116)(117)

- Transient obstruction, with repeated episodes

- Eosinophilic esophagitis, known, and need for evaluation of response to medical or dietary treatment(129)(130)(131)
- Esophageal varices and **1 or more** of the following(141)(142)(143)(144)(145):
  - Need for ligation or sclerosis of known esophageal varices(4)(147)(148)
  - Screening for esophageal varices in patient at high risk (eg, known chronic liver disease)(149)
- Foreign body ingestion, known or suspected(88)(92)(126)(150)
- Gastric intestinal metaplasia on prior biopsy and increased risk of gastric cancer, as indicated by **1 or more** of the following(153):
  - First-degree relative[L] with gastric cancer, and patient without UGI endoscopy in last 3 years(52)(154)
  - First-degree relative[L] with gastric cancer, and patient with advanced atrophic gastritis[M] and no UGI endoscopy in last 1 year(52)
  - Patient with advanced atrophic gastritis,[M] and no UGI endoscopy in last 3 years(52)
- Gastroesophageal reflux disease symptoms and **1 or more** of the following(14)(15)(88)(155)(156):
  - Anemia
  - Dysphagia(158)
  - Eosinophilic esophagitis, suspected, and need for biopsy(88)(110)(111)(112)
  - Epigastric mass on examination
  - Failure of medical therapy (eg, poor response to empiric twice-daily proton pump inhibitor for 4 to 8 weeks)(159)
  - Gastrointestinal bleeding(160)
  - History of esophageal stricture and recurrent dysphagia
  - Involuntary weight loss since onset of symptoms
  - Male 50 years or older with 5 years or more of gastroesophageal reflux disease symptoms and **1 or more** of the following(161):
    - Elevated BMI
    - Hiatal hernia
    - Intra-abdominal distribution of fat
    - Nocturnal reflux symptoms
    - Tobacco use
  - Persistent symptoms after antireflux surgery(162)
  - Planned bariatric surgery(115)(116)(117)(118)
  - Recurrent vomiting
  - Severe erosive esophagitis, known, and need for follow-up after 8 weeks of proton pump inhibitor therapy
  - Symptoms after bariatric surgery(115)(116)(117)
- Gastrointestinal bleeding, as indicated by **1 or more** of the following(2)(4)(163)(164):
  - Blood in stool and suspected UGI source (eg, positive nasogastric tube aspirate, history of dyspepsia)(168)(169)
  - Hematemesis(165)(167)(170)
  - Melena(167)
  - Persistent occult bleeding after negative endoscopies, and need for repeat test(171)
  - Recurrent bleeding evident, with history of UGI bleeding or ulcer(170)
- Hiatal hernia, known or suspected(172)
- History of UGI bleeding or ulcer, and results may change management, as indicated by **1 or more** of the following:
  - Long-term anticoagulation planned
  - Long-term NSAID therapy planned
  - Organ transplant planned
- Iron deficiency anemia with no other source of chronic blood loss identified(2)(171)(173)(174)(175)
- Nausea and vomiting, unexplained(4)(176)
- Odynophagia[K](4)
- Peptic ulcer disease, as indicated by **1 or more** of the following(4)(177):
  - Before treatment for suspected ulcer, with **1 or more** of the following:
    - Blood in stool
    - Definitive diagnosis of *Helicobacter pylori* infection required because of **ALL** of the following:
      - Empirical trial of treatment inappropriate because of history of adverse drug reactions
      - Results of noninvasive tests for *Helicobacter pylori* negative or indeterminate
    - History of UGI surgery, gastrointestinal tract anomalies, or complicated antral, pyloric, or duodenal ulcer with scarring or gastric outlet obstruction(179)
    - Iron deficiency anemia
  - Gastric ulcer and **1 or more** of the following:
    - Dysplasia on initial biopsy
    - Family history of gastric cancer
    - Ulcer appearance on initial endoscopy large or suspicious for malignancy(180)
    - Ulcer appearance on UGI barium study suspicious for malignancy

        - Ulcer not associated with NSAID usage(181)
    - After treatment of duodenal ulcer, with **1 or more** of the following:
        - Incomplete clinical response to treatment
        - Ulcer complicated by bleeding or obstruction
        - Ulcer initially greater than 2 cm in diameter
- Weight loss, unexplained(4)

Alternatives to Procedure

- Alternatives include:
    - Abdominal CT scan. See Abdominal/Pelvic CT Scan AC for further information.
    - Abdominal ultrasound. See Abdominal Ultrasound AC for further information.
    - Capsule endoscopy.(182)(183) See Capsule Endoscopy AC for further information.
    - Contrast swallowing evaluation. See UGI Contrast Studies: Esophagography, UGI Study, Small Bowel Follow-Through, and Swallowing Evaluation AC for further information.
    - Esophageal transit scintigraphy. See Esophageal Transit Scintigraphy AC for further information.
    - Gastric emptying study. See Gastric Emptying Study (Gastric Scintigraphy) AC for further information.
    - Gastrointestinal blood loss study
    - UGI contrast studies.(184) See UGI Contrast Studies: Esophagography, UGI Study, Small Bowel Follow-Through, and Swallowing Evaluation AC for further information.

Evidence Summary

Background

Esophagogastroduodenoscopy, also known as UGI endoscopy, is performed by passing a flexible endoscope through the nose or mouth in order to view the esophagus, stomach, and duodenum.(1)(2) **(EG 2)** It allows direct visualization of the mucosa and permits directed biopsy and endoscopic therapy.(1)(2) **(EG 2)**

Criteria

For achalasia, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** Specialty society guidelines support the use of UGI endoscopy for management of achalasia (eg, botulinum toxin injection, balloon dilation).(4)(7)(8)(9) **(EG 2)** OnabotulinumtoxinA has a 1-month response rate of greater than 75%; however, approximately 50% of patients relapse and require repeat injections at 6-month to 24-month intervals. Studies of balloon dilation report therapeutic success in up to 90% of patients, with relapse occurring in about 1/3 of patients over a 4-year to 6-year period; repeat dilation can achieve long-term symptomatic remission in the majority of patients.(3)(10) **(EG 2)** Both onabotulinumtoxinA injection and balloon dilation are inferior to surgical myotomy, which is the treatment of choice for younger patients and those without contraindications to surgical therapy.(11)(12) **(EG 2)**

For atypical chest pain, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Esophageal chest pain closely mimics cardiac chest pain, which should be the primary consideration and excluded or treated before UGI endoscopy is performed.(13) **(EG 2)** Up to 65% of patients with achalasia will present with chest pain.(11) **(EG 2)** An expert consensus guideline recommends evaluation with UGI endoscopy for individuals with noncardiac chest pain who have not responded adequately to a trial of proton pump inhibitor therapy or who have alarm symptoms.(15) **(EG 2)**

For Barrett esophagus, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** A systematic review and meta-analysis of 37 studies (521 patients) evaluating the efficacy of endoscopic treatments for low-grade dysplasia associated with Barrett esophagus found pooled rates of complete eradication of intestinal metaplasia and dysplasia of 68% and 89%, respectively; the pooled incidence of progression to cancer was 3.9 per 1000 patient-years.(24) **(EG 1)** Reviews of studies of endoscopic mucosal resection for Barrett esophagus with high-grade dysplasia reported complete remission rates of 88% to 100%.(25)(26) **(EG 2)** Studies of 50 or more patients with low-grade dysplasia followed for 2 to 7 years found that the incidence of cancer ranged from 1% to 39%.(27) **(EG 2)** Consensus statements from an international multidisciplinary group that performed a comprehensive literature review recommend that a high-resolution endoscope be used for surveillance of patients with Barrett esophagus and that 4-quadrant biopsies are needed to exclude synchronous neoplastic lesions. Moreover, endoscopic mucosal resection of high-grade dysplasia and subsequent ablation has been found to be superior to surveillance alone and can result in complete remission of neoplasia in 80% to 100% of cases.(17)(28)(29) **(EG 2)** For patients with Barrett esophagus with confirmed low-grade dysplasia, a specialty society guideline considers both endoscopic therapy and endoscopic surveillance for progression to be acceptable alternatives.(23) **(EG 2)**

For esophageal or gastric cancer and need for endoscopic treatment, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** Specialty society guidelines support the use of UGI endoscopy for ablation or removal of selected

polyps, tumors, or other lesions; for dilation of malignant strictures; for palliative stent placement in patients with stenosing neoplasms or malignant esophageal fistulas; or for tumor debulking or ablation (eg, electrocautery, laser, chemical) of stenosing esophageal neoplasms.(1)(17)(34)(35) **(EG 2)** A retrospective matched cohort study that included 114 patients with mucosal esophageal adenocarcinoma found that both en bloc esophagectomy and endoscopic resection are effective when done in high-volume centers; however, esophagectomy was associated with higher morbidity and risk for procedure-related mortality, while endoscopic resection was associated with a higher recurrence rate that mandated thorough follow-up.(36) **(EG 2)** A systematic review and meta-analysis of 19 studies (6118 patients) did not identify any randomized controlled trials comparing endoscopic resection with gastrectomy for early gastric cancer; however, it found that there was no significant difference in 3-year and 5-year disease-free survival or 5-year and 10-year overall survival between the procedures. Endoscopic resection was associated with increased rates of local recurrence and metachronous lesions.(37) **(EG 1)** A systematic review of stents for malignant gastric outlet obstruction found that the postprocedure clinical success rate was 83% with a mean patency time of 115 days.(38) **(EG 2)**

For esophageal or gastric cancer screening, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** An evidence-based specialty society guideline recommends consideration of periodic surveillance with UGI endoscopy and biopsies for patients with hereditary cancer predisposition syndromes (eg, tylosis, familial Barrett esophagus, Bloom syndrome, Fanconi anemia).(17) **(EG 2)** Uncontrolled studies and database analysis suggest a reduction in mortality with screening patients at increased risk for gastric cancer.(39)(64) **(EG 2)** The accuracy of UGI endoscopy with adequate biopsies for the detection and diagnosis of early gastric cancer in patients at increased risk has been reported to be between 90% and 96%, making it the gold standard for gastric cancer diagnosis.(39) **(EG 2)** A specialty society guideline recommends UGI endoscopic surveillance for esophageal carcinoma in patients with a history of achalasia or caustic injury to the esophagus; however, the authors note that there is no consensus among experts regarding when to initiate endoscopic screening and the frequency for subsequent surveillance.(65) **(EG 2)**

For cancer surveillance, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Because the majority of esophageal and gastric cancers relapse within 2 to 5 years after completion of local therapy, specialty society guidelines recommend careful surveillance UGI endoscopy with multiple (eg, at least 4 to 6) biopsies of suspicious lesions and strictures after definitive treatment of gastric or esophageal cancer or other previously removed precancerous lesions; endoscopic surveillance includes a search for Barrett esophagus with 4-quadrant biopsies in patients treated locally for esophageal cancer.(17)(34) **(EG 2)** These same specialty society guidelines also note that, although the evidence to screen specifically for gastric cancer in individuals with hereditary cancer syndromes is limited, there are surveillance protocols in place for these patients who have had nonmalignant colon lesions removed during previous screening or surveillance colonoscopies, based on their specific hereditary cancer syndrome diagnosis.(34) **(EG 2)** For patients with Barrett esophagus with confirmed dysplasia, a specialty society guideline considers both endoscopic therapy and endoscopic surveillance for progression to be acceptable alternatives.(23) **(EG 2)**

For caustic ingestion, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** A specialty guideline supports the use of UGI endoscopy for assessment of acute injury after caustic ingestion.(1) **(EG 2)** In a multicenter observational study of 162 children of median age 36.9 months, multivariate analysis showed that the presence of symptoms was significantly associated with severe esophageal lesions (odds ratio of 2.3), leading to the conclusion that endoscopy is mandatory in symptomatic patients.(91) **(EG 2)** A review article recommends UGI endoscopy within 12 to 24 hours of a suspected caustic ingestion in patients who are symptomatic, have oropharyngeal burns, or have significant history of ingestion (eg, intentional ingestion).(89) **(EG 2)** A specialty society guideline recommends UGI endoscopy within 24 hours of the suspected exposure for children who are symptomatic after suspected caustic ingestion; asymptomatic children with suspected caustic ingestion may be able to be observed without UGI endoscopy, but adequate follow-up must be assured.(88) **(EG 2)** A specialty society guideline recommends emergent endoscopy after a caustic ingestion when CT scan of the neck, thorax, and abdomen is unavailable, contraindicated, or indeterminate, and in pediatric patients, but notes that CT scan may be more sensitive for detecting transmural injuries and predicting esophageal stricture formation after caustic ingestions.(92) **(EG 2)**

For Crohn disease, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** A systematic review of 20 studies of 2511 patients with Crohn disease who underwent gastroduodenal biopsy reported a prevalence of UGI involvement of 34%.(98) **(EG 1)** According to a specialty society guideline, routine UGI endoscopy is not recommended for all adult patients suspected of having Crohn disease because when the UGI tract is involved in Crohn disease, disease is usually present in the terminal ileum, colon, or perianal area.(93) **(EG 2)** However, a review article and a specialty society recommend that UGI endoscopy should be part of the initial diagnostic evaluation of suspected Crohn disease in pediatric patients regardless of UGI symptoms.(93)(95)(96) **(EG 2)** Patients with symptomatic duodenal strictures due to Crohn disease may benefit from endoscopic balloon dilation.(93) **(EG 2)**

For duodenal disease and need for examination and biopsy (eg, celiac disease, neoplastic lesion), evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** Specialty society guidelines support the use of UGI endoscopy for biopsy confirmation of suspected celiac disease and suspected neoplastic lesion.(1)(4)(99)(100)(102) **(EG 2)** An observational study of 47 pediatric patients with suspected celiac disease who underwent duodenal biopsy found that the diagnosis was confirmed in 89% of cases.(103) **(EG 2)**

For dyspepsia, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** UGI endoscopy should be performed in patients with alarm features (eg, weight loss, iron deficiency anemia) and is a useful diagnostic tool if empiric treatment does not resolve symptoms.(2) **(EG 2)** A retrospective review of 2000 consecutive patients who underwent UGI endoscopy for UGI

symptoms showed that a significantly higher percentage of patients with alarm symptoms (eg, dysphagia, vomiting, anemia, weight loss, persistent symptoms) had abnormal findings as compared with patients without alarm symptoms (65% vs 42%, respectively).(104) **(EG 2)** Subspecialty society practice guidelines note that UGI endoscopy can be used to evaluate suspected enterocolitis due to immune checkpoint inhibitor therapy, especially if the symptoms are predominantly UGI in nature (eg, dyspepsia, nausea, vomiting) or if symptoms persist despite a negative lower endoscopy.(105)(106) **(EG 2)** A specialty society guideline suggests that, because UGI endoscopy can identify conditions that could be treated before bariatric surgery, routine preoperative UGI endoscopy in patients undergoing bariatric surgery may be reasonable, but notes that routine screening is controversial. The authors recommend UGI endoscopy after bariatric surgery in patients with gastrointestinal symptoms and note that routine UGI endoscopy 3 or more years after sleeve gastrectomy may be reasonable, based on limited evidence.(107) **(EG 2)**

For dysphagia, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** UGI endoscopy is indicated to rule out esophageal carcinoma in patients with symptoms of bleeding and dysphagia.(41) **(EG 2)** Specialty society guidelines support the use of UGI endoscopy for confirmation and histologic diagnosis of suspected upper tract stricture or obstruction as demonstrated by radiographic testing and for UGI symptoms that are persistent or recurrent (eg, dysphagia due to suspected achalasia, benign or malignant stricture, esophageal reflux).(1)(4) **(EG 2)** When mechanical obstruction is suspected as a cause of dysphagia, UGI endoscopy is a useful initial diagnostic test because it permits immediate biopsy with or without dilation of strictures, masses, or rings.(2)(41)(109)(119) **(EG 2)** Database analysis of patients undergoing dilation for a symptomatic esophageal ring found that 65% of the patients had symptoms of dysphagia.(120) **(EG 2)** A small observational study of children with a suspected vascular ring found that there was 85% agreement between endoscopic and surgical findings.(121) **(EG 2)** Recurrent dysphagia can occur in up to 40% of patients who had stent placement for malignant stricture due to stent migration, tumor growth, or food obstruction.(60) **(EG 2)** A specialty society guideline states that a biopsy that shows a peak eosinophil level of 15 or more cells per high-power field is required to make a diagnosis of eosinophilic esophagitis in patients who have symptoms of esophageal dysfunction, including dysphagia.(122) **(EG 2)** A specialty society guideline suggests that, because UGI endoscopy can identify conditions that could be treated before bariatric surgery, routine preoperative UGI endoscopy in patients undergoing bariatric surgery may be reasonable, but notes that routine screening is controversial. The authors recommend UGI endoscopy after bariatric surgery in patients with gastrointestinal symptoms and note that routine UGI endoscopy 3 or more years after sleeve gastrectomy may be reasonable, based on limited evidence.(107) **(EG 2)**

For eosinophilic esophagitis, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Treatment for eosinophilic esophagitis includes proton pump inhibitors, topical corticosteroids, and elemental or 6-food elimination diets, with the therapeutic goals of normalizing esophageal inflammation and reducing symptoms.(132)(133)(134) **(EG 2)** While disease severity scores based on findings on UGI endoscopy have been validated and are recognized as clinical and trial endpoints, measures of disease severity based on clinical signs and symptoms have been investigated but are not well validated.(131)(135)(136)(137)(138) **(EG 2)** An expert consensus guideline recommends UGI endoscopy with biopsies to evaluate the response to dietary changes or pharmacologic treatment in patients with eosinophilic esophagitis.(130) **(EG 2)** A joint task force guideline on the management of eosinophilic esophagitis notes that it is reasonable to monitor UGI endoscopy findings after treatment changes because symptom-based assessments may be misleading.(129) **(EG 2)** Another joint task force guideline recommends UGI endoscopy to evaluate the efficacy of therapies for eosinophilic esophagitis, based on expert opinion.(139) **(EG 2)** A specialty society guideline on the management of pediatric eosinophilic esophagitis recommends UGI endoscopy 4 to 12 weeks after a change in therapy.(140) **(EG 2)**

For esophageal varices, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Specialty society guidelines support the use of UGI endoscopy for patients with cirrhosis in order to document and treat esophageal varices.(141)(142)(143)(146) **(EG 2)**

For known or suspected foreign body ingestions, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Although most ingested foreign objects pass through the gastrointestinal tract without causing symptoms, UGI endoscopy may be indicated, depending on the object and its location. Ingested button batteries lodged in the esophagus are associated with a high risk of esophageal burns and stenosis due to discharged electric current and should be removed by UGI endoscopy emergently.(89)(150)(151) **(EG 2)** Most button batteries that have passed beyond the esophagus will pass spontaneously, but in some circumstances (eg, symptomatic patient, delayed presentation), UGI endoscopy may still be indicated to evaluate for esophageal injury.(150) **(EG 2)** An observational study of 115 pediatric patients who underwent endoscopic removal of a foreign body of the esophagus found that surgery was required in less than 1% of patients.(152) **(EG 2)** A specialty society guideline on pediatric foreign body ingestions recommends emergent or urgent UGI endoscopy for pediatric patients with suspected ingestions of a variety of objects (eg, button battery, magnets, sharp objects), with level of urgency depending on the object's location and the presence of symptoms. For a witnessed or suspected button battery ingestion, with the object lodged in the esophagus, emergent endoscopic removal is indicated; while the authors note that the management of a button battery located in the stomach or beyond is more controversial, they suggest UGI endoscopy for patients age 5 years or younger with ingestion of a larger battery (20 mm or greater).(126) **(EG 2)** Another specialty society guideline recommends emergent UGI endoscopy (within 2 hours) for pediatric patients with impacted esophageal button batteries or esophageal, gastric, or proximal duodenal sharp-pointed objects, regardless of symptoms, and for symptomatic patients with impacted esophageal blunt foreign bodies. Indications for urgent UGI endoscopy (within 24 hours) include esophageal foreign bodies in asymptomatic patients, blunt foreign bodies in the stomach or duodenum when associated with symptoms or when the object is larger than 2.5 cm in diameter or 6 cm or more in length, and all magnets within endoscopic reach.(88) **(EG 2)**

For gastric intestinal metaplasia, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Gastric cancer develops along a continuum starting with nonatrophic gastritis and progressing to atrophic gastritis, then to intestinal metaplasia followed by dysplasia, and finally to gastric adenocarcinoma. Chronic infection with *Helicobacter pylori* is considered to be a primary risk factor.(153)(154) **(EG 2)** Although the evidence to inform the optimal endoscopic surveillance intervals in patients with gastric intestinal metaplasia is limited, specialty society guidelines recommend that endoscopic surveillance should be based on family history of gastric cancer, most recent gastric histopathologic findings, and the anatomic location of the gastric intestinal metaplasia in the stomach (eg, antrum, corpus).(52)(153) **(EG 2)**

For gastroesophageal reflux disease symptoms, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** A clinical practice guideline recommends UGI endoscopy for certain patients with gastroesophageal reflux disease, including those who have alarm symptoms, those who have failed a trial of medical therapy, and those who require reassessment after treatment for severe erosive esophagitis; however, it was noted that no direct evidence shows that screening and surveillance endoscopy programs decrease death from adenocarcinoma of the esophagus.(1)(157) **(EG 2)** Cohort and case control studies have suggested that esophageal cancer discovered through endoscopic screening and surveillance is associated with longer survival time than esophageal cancer presenting symptomatically; however, these studies are limited by lead time and length bias.(157) **(EG 2)** A specialty society guideline suggests that, because UGI endoscopy can identify conditions that could be treated before bariatric surgery, routine preoperative UGI endoscopy in patients undergoing bariatric surgery may be reasonable, but notes that routine screening is controversial. The authors recommend UGI endoscopy after bariatric surgery in patients with gastrointestinal symptoms and note that routine UGI endoscopy 3 or more years after sleeve gastrectomy may be reasonable, based on limited evidence.(107) **(EG 2)**

For gastrointestinal bleeding, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** UGI endoscopy is indicated for evaluation of blood in stools and occult fecal blood if no source is found on colonoscopy.(1) **(EG 2)** For hematemesis, early UGI endoscopy (within 24 hours of presentation) is recommended to reduce the risk of further bleeding and potentially allow a shorter length of stay; patients with low-risk features on initial UGI endoscopy may be safely discharged promptly after UGI endoscopy, while patients with high-risk features may require additional endoscopic hemostatic therapy.(147)(163)(165) **(EG 2)** UGI endoscopy is indicated in the evaluation of melena because the UGI tract is the most likely source of bleeding.(166) **(EG 2)** A randomized trial of 516 patients presenting to the emergency department with an acute UGI bleed compared UGI endoscopy performed within 6 hours and 24 hours of specialist consultation and found, at 30-day follow-up, that there was no difference in mortality or incidence of further bleeding between groups. The authors noted that exclusion of hemodynamically unstable patients with ongoing bleeding limited generalizability.(167) **(EG 1)**

For hiatal hernia, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** A review article notes that UGI endoscopy is useful for both diagnosis of hiatal hernia and evaluation of associated findings such as esophagitis and Barrett esophagus.(172) **(EG 2)**

For a history of UGI bleeding or ulcer, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** A specialty society guideline supports the use of UGI endoscopy for the identification of UGI pathology that may modify planned management (eg, patient is a transplant candidate, prior to initiation of long-term anticoagulation or NSAID therapy for arthritis).(1) **(EG 2)**

For iron deficiency anemia, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Specialty society guidelines support the use of UGI endoscopy for evaluation of iron deficiency anemia when there is no other source of chronic blood loss, particularly when the clinical situation suggests a UGI source.(1)(173)(175) **(EG 2)**

For nausea and vomiting (unexplained), evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Specialty society guidelines support the use of UGI endoscopy for persistent vomiting of unknown etiology.(1)(4) **(EG 2)**

For odynophagia, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Specialty society guidelines support the use of UGI endoscopy for the evaluation of patients with odynophagia.(1)(4) **(EG 2)**

For peptic ulcer disease, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** UGI endoscopy is the most sensitive and specific technique for examining the UGI tract; approximately 8% of gastric ulcers that appear to be benign on radiography are malignant on endoscopy or surgery.(177) **(EG 2)** UGI endoscopy is a useful diagnostic tool if treatment for diagnosed *Helicobacter pylori* infection results in an incomplete clinical response.(177)(178) **(EG 2)** A retrospective review of 2000 consecutive patients who underwent UGI endoscopy for evaluation of UGI symptoms showed that a significantly greater percentage of patients with alarm symptoms (including gastrointestinal bleeding and anemia) had abnormal findings (including gastric inflammation, ulcer, and cancer) as compared with patients without alarm symptoms (65% vs 42%, respectively).(104) **(EG 2)**

For weight loss (unexplained), evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Specialty society guidelines support the use of UGI

endoscopy for upper abdominal symptoms associated with unexplained weight loss.(1)(4) **(EG 2)**

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Footnotes

[A] Barrett esophagus is the replacement of the normal squamous epithelium of the esophagus that is damaged by gastroesophageal reflux disease with metaplastic columnar or glandular epithelium that is predisposed to esophageal adenocarcinoma.(16)(17)(18)(19)(20) [A in Context Link 1, 2]

[B] UGI cancer screening involves detecting and removing premalignant lesions (eg, dysplasia) in patients to improve survival.(61)(62) Surveillance starts after achieving complete eradication of initially screened precancerous or early cancer lesions.(61)(62) [B in Context Link 1, 2, 3, 4]

[C] Individuals with Lynch syndrome have increased risk of gastric and small bowel cancer, but evidence to support specific screening strategies is limited. Screening with UGI endoscopy beginning at age 30 years is suggested for individuals with Lynch syndrome and at-risk family members, with subsequent screening every 2 to 4 years; consideration for earlier initiation of screening or shorter intervals is suggested for those at higher risk (eg, family history of UGI cancers).(66)(67) [C in Context Link 1, 2, 3]

[D] Peutz-Jeghers syndrome can be diagnosed by genetic testing; it can also be diagnosed clinically with 2 or more of the following: family history of Peutz-Jeghers syndrome; 2 or more hamartomatous polyps in the gastrointestinal tract; or mucocutaneous hyperpigmentation of the mouth, lips, nose, eyes, genitalia, or fingers.(69) [D in Context Link 1, 2, 3]

[E] Tylosis is a rare autosomal dominant syndrome associated with increased risk of esophageal squamous cell carcinoma.(1)(17) [E in Context Link 1]

[F] Juvenile polyposis syndrome can be diagnosed by genetic testing; it can also be diagnosed endoscopically by 5 or more juvenile polyps in the colon, multiple juvenile polyps found throughout the gastrointestinal tract, or any number of juvenile polyps in a patient with a family history of juvenile polyposis syndrome.(69) [F in Context Link 1, 2]

[G] Li-Fraumeni syndrome is a cancer predisposition syndrome characterized by a variety of early-onset tumors, including premenopausal breast cancer, colon cancer, sarcoma, adrenocortical carcinoma, hypodiploid acute lymphoblastic leukemia, melanoma, pancreatic cancer, and brain tumors. A diagnosis of Li-Fraumeni syndrome is established by identification of a heterozygous germline mutation in the TP53 gene and/or the presence of clinical features meeting consensus diagnostic criteria.(78) [G in Context Link 1]

[H] Intervals for follow-up UGI endoscopy for patients who have undergone endoscopic eradication therapy for Barrett esophagus with low-grade dysplasia may be individualized, with shorter intervals if complete eradication of intestinal metaplasia was not achieved.(23)(30) [H in Context Link 1]

[I] Individuals with Spigelman stage IV duodenal findings should undergo expert surveillance endoscopy every 3 to 6 months. Surgical evaluation and counseling are also recommended.(66) [I in Context Link 1, 2, 3]

[J] Colonic adenomatous polyposis of unknown etiology is defined as a cumulative lifetime history of 10 to 20 or more adenomas without a pathogenic mutation identified in a polyposis gene.(66) [J in Context Link 1]

[K] Odynophagia is the sensation of pain on swallowing.(109) [K in Context Link 1, 2]

[L] First-degree relatives consist of male or female parents, siblings, or children.(113) [L in Context Link 1, 2, 3]

[M] Advanced atrophic gastritis is defined as severe atrophic changes or intestinal metaplasia in both the antrum and corpus of the stomach. Gastric intestinal metaplasia may be histologically graded as complete (ie, small intestinal-type histopathology) or incomplete (ie, at least partial colonic-type intestinal histopathology).(52)(154) The risk of gastric cancer in patients with extensive atrophic gastritis (eg, gastric body plus incisura and/or antrum) is greater than the risk in patients with limited gastric involvement (eg, antrum or incisura). Low-quality evidence suggests that patients with partial or total colonic-type gastric intestinal metaplasia are at higher risk of progressing to gastric cancer as compared with patients with histologically complete (ie, small intestinal-type) gastric intestinal metaplasia; however, histopathology risk stages for gastric intestinal metaplasia specimens are not routinely used in all clinical pathology laboratories.(52)(154) [M in Context Link 1, 2]

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