MEDICAL POLICY

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Medical Policy Title	**Peroral Endoscopic Myotomy (POEM) Procedures**
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Our medical policies are guides to evaluate technologies or services for medical necessity. Criteria are established through the assessment of evidence based, peer-reviewed scientific literature, and national professional guidelines. Federal and state law(s), regulatory mandates and the member's subscriber contract language are considered first in the determination of a covered service.
(Link to Product Disclaimer)

POLICY STATEMENT(S)

I. Esophageal peroral endoscopic myotomy (POEM) is considered **medically necessary** for type III achalasia when **ALL** of the following criteria are met:

   A. Age 18 years or older;

   B. Eckardt symptom score is greater than or equal to 3;

   C. Objective evidence of type III achalasia demonstrated by **all** of the following:

      1. High-resolution manometry or EndoFLIP;

      2. Barium esophagram; **and**

      3. Upper endoscopy.

II. Esophageal POEM is considered **medically necessary** for individuals with recurrent achalasia following prior surgical Heller myotomy (type I, II, or III achalasia) when **ALL** of the following are met:

   A. Age 18 years or older;

   B. Eckard symptom score is greater than or equal to 3;

   C. Objective evidence of recurrent achalasia following prior surgical Heller myotomy, demonstrated by **all** of the following:

      1. High-resolution manometry or EndoFLIP;

      2. Barium esophagram; **and**

      3. Upper endoscopy.

III. Repeat esophageal POEM is considered **medically necessary** when **ALL** of the following criteria are met:

   A. Age 18 years or older;

   B. Objective evidence of recurrent type III achalasia following prior POEM, demonstrated by **all** of the following:

1. High-resolution manometry or EndoFLIP;
2. Barium esophagram; **and**
3. Endoscopic findings.

IV. Peroral endoscopic myotomy (POEM) is considered **investigational** in all other scenarios, including but not limited to:

A. Age 17 years or younger (See Policy Guideline II);

B. Esophageal POEM for the treatment of type I or II achalasia, unless criteria outlined in Policy Statement II are met;

C. Gastric POEM (G-POEM) for the treatment of gastroparesis;

D. Zenker POEM (Z-POEM) for the treatment of Zenker diverticulum.

RELATED POLICIES

Corporate Medical Policy

7.01.45 Transendoscopic Therapies for Gastroesophageal Reflux Disease (GERD)

7.01.89 Magnetic Sphincter Augmentation for the Treatment of Gastroesophageal Reflux Disease (GERD)

11.01.03 Experimental or Investigational Services

POLICY GUIDELINE(S)

I. Achalasia is diagnosed using high-resolution esophageal manometry (HRM), upper endoscopy (EGD) and radiographic studies (e.g., fluoroscopic barium swallow, endoluminal functional lumen imaging probe [EndoFLIP]).

II. Requests for esophageal POEM in pediatric patients (age 17 years or younger) diagnosed with achalasia are reviewed on a case-by-case basis by Medical Directors. Coverage may be deemed appropriate when the procedure is performed by pediatric gastroenterologists at a tertiary care center, and the submitted medical records provide comprehensive documentation of objective evidence, symptomology, and conservative treatments.

DESCRIPTION

Peroral endoscopic myotomy (POEM) of the esophagus is a minimally invasive technique originally developed to treat to treat esophageal motility disorders, such as achalasia. The procedure involves the insertion of an endoscope through the mouth and advancement to the esophagogastric junction. A submucosal tunnel is created in the proximal esophageal mucosa, allowing for selective division of the inner circular muscle fibers of the lower esophageal sphincter (LES). This targeted myotomy relieves the functional obstruction caused by impaired LES relaxation, thereby facilitating the passage of food into the stomach. Unlike traditional laparoscopic Heller myotomy, which typically involves cutting both the circular and longitudinal muscle layers, POEM preserves the outer longitudinal

muscle layer, potentially reducing postoperative complications and preserving structural integrity.

Gastric POEM (G-POEM) is a minimally invasive endoscopic procedure under investigation for the treatment of medically refractory gastroparesis, a chronic gastric motility disorder characterized by delayed gastric emptying in the absence of mechanical obstruction. G-POEM is modeled after the established POEM technique for achalasia and is considered for patients who fail conservative management, including dietary modification, hydration and glycemic control, and pharmacologic therapy (e.g., antiemetics, prokinetics such as metoclopramide, or off-label agents like erythromycin). The procedure involves the creation of a submucosal tunnel in the gastric antrum, allowing endoscopic access to the pyloric sphincter muscle, which is then selectively divided. This pyloromyotomy aims to reduce outflow resistance at the gastric outlet and improve gastric emptying.

Diverticular POEM (D-POEM) and Zenker POEM (Z-POEM) are adapted from POEM for achalasia, allowing for precise myotomy under direct visualization, potentially reducing the risk of perforation and recurrence. These minimally invasive techniques under investigation for the treatment of symptomatic esophageal diverticula, which are rare outpouchings of the esophageal wall. Zenker's diverticulum, the most common subtype, arises in the upper esophagus due to dysfunction of the cricopharyngeal muscle. D-POEM refers more broadly to procedures targeting various types of esophageal diverticula and involves direct incision through both the mucosa and muscle at the septum between the esophagus and the diverticulum. In contrast, Z-POEM employs a submucosal tunneling technique to expose and divide the cricopharyngeal muscle while preserving the overlying mucosa.

Achalasia is a rare esophageal motility disorder characterized by reduced numbers of neurons in the esophageal myenteric plexuses and reduced peristaltic activity, leading to impaired peristalsis and failure of LES relaxation. Common symptoms include progressive dysphagia to both solids and liquids, chest pain, heartburn, regurgitation of undigested food, and varying degrees of weight loss or nutritional deficiencies (Vaezi 2020).

According to the American Society for Gastrointestinal Endoscopy (ASGE), in patients presenting with symptoms suggestive of achalasia, upper endoscopy is essential to exclude pseudoachalasia or other forms of mechanical obstruction at the esophagogastric junction (EGJ). However, a definitive diagnosis of achalasia cannot be established by endoscopy alone. A timed barium esophagram, which involves fluoroscopic imaging of esophageal emptying after ingestion of a standardized volume of barium, is recommended to support diagnosis, monitor treatment response, and predict symptom recurrence.

The gold standard for diagnosing achalasia is high-resolution esophageal manometry (HRM), which identifies three subtypes of achalasia based on esophageal pressurization and contraction patterns. Additional diagnostic tools may include barium swallow, upper endoscopy, and functional lumen imaging probe (FLIP). Treatment is palliative, aiming to reduce symptoms, improve esophageal emptying, and prevent further dilation. Therapy options include pharmacologic (e.g., calcium channel blockers, nitrates), endoscopic (e.g., injections with botulinum toxin, pneumatic dilation [PD]), and surgery (e.g., laparoscopic Heller myotomy [LHM]).

The Chicago Classification is a standardized system used to interpret high-resolution esophageal

manometry (HRM) studies, which assess esophageal motor function. The latest version, Chicago Classification Version 4.0 (CCv4.0) continues to define three subtypes of achalasia (Yadlapati 2021):

- Type I (classical achalasia): an abnormal median integrated relaxation pressure (IRP), and 100% failed peristalsis, with no panesophageal pressurization.
- Type II: an abnormal median IRP and 100% failed peristalsis, accompanied by panesophageal pressurization in ≥20% of swallows.
- Type III (spastic achalasia): an abnormal IRP and ≥20% of swallows with premature contractions, with no evidence of normal peristalsis.

The Eckardt score is a symptom-based clinical tool used to assess the severity of achalasia and monitor treatment success. It evaluates four key symptoms: dysphagia, regurgitation chest pain, and weight loss. Each symptom is scored from 0 to 3 based on frequency or severity. The total score ranges from 0 to 12, with a score ≥3 indicative of clinically significant achalasia.

Score	Weight loss (kgs)	Dysphagia	Retrosternal pain	Regurgitation
0	None	None	None	None
1	<5	Occasional	Occasional	Occasional
2	5-10	Daily	Daily	Daily
3	>10	Each meal	Each meal	Each meal

SUPPORTIVE LITERATURE

Esophageal POEM - Adult Achalasia

Ponds et al (2019) conducted a multicenter, randomized clinical trial (RCT) across six international hospitals (Netherlands, Germany, Italy, Hong Kong, and the United States) to compare the efficacy and safety of peroral endoscopic myotomy (POEM) versus pneumatic dilation (PD) in treatment-naive patients with achalasia. Long-term follow-up results were published by Kuipers et al (2022). A total of 130 patients were randomized, including those with achalasia type I (n=31), type II (n=81), and type III (n=18). Of these, 64 patients underwent POEM: type I (n=10; 16%); type II (n=42; 65%); and type III (n=8; 19%). The remaining 66 patients were assigned to the PD group. The primary outcome was treatment success at 2 years, defined as an Eckardt score ≤3 without retreatment. POEM achieved treatment success in 92% (58/63) of patients compared to 54% (34/63) in the PD group, with a statistically significant difference of 38% ($P < .001$). Of the 14 secondary endpoints, no significant differences were found in ten. There were no significant between-group differences in median integrated relaxation pressure or barium column height ($P = .05$). However, reflux esophagitis occurred more frequently in the POEM group (41% vs 7%; $P = .002$). Notably, two serious adverse events (including one perforation) occurred in the PD group, while none were reported in the POEM group. Limitations included the unblinded design, absence of a strict intention-to-treat analysis, and slightly different follow-up durations (24 months for POEM vs 24.5 months for

PD). Five-year follow-up data are pending to assess durability of treatment effect. The authors concluded that POEM offers superior long-term efficacy compared to PD and should be considered a first-line treatment option for achalasia, while emphasizing the need for post-procedural GERD monitoring.

Kuipers et al (2022) reported the 5-year outcomes of a multicenter, randomized controlled trial originally conducted by Ponds and colleagues (2019) across six international centers comparing POEM with PD in treatment-naïve patients with achalasia. At 5 years, 62 patients in the POEM group and 63 in the PD group were available for analysis. The primary outcome, treatment success defined as Eckardt score ≤ 3 without retreatment, was achieved in 81% (50/62) of POEM patients and 40% (25/63) of PD patients. The median time to treatment failure was 60 months for POEM and 24 months for PD. Retreatment rates were similar with 13% in the POEM group compared to 11% in the PD group. Symptom recurrence, defined as having an Eckhardt score >3, occurred in 18% of POEM patients and 40% of PD patients. The rate of adverse events was 0% in the POEM group and 2% in the PD group. Among patients still in clinical remission at 5 years, proton pump inhibitor (PPI) use was significantly higher after POEM (46% vs 13%; P=.0081), GERD questionnaire were also higher in POEM patients (mean score 7 vs 6; P = .0081), and endoscopic reflux esophagitis was observed in 33% (14/42) patients in the POEM group and 13% (2/16) patients in the PD group (p=0.19). No serious intervention-related adverse events occurred between years 2 and 5. The authors concluded that POEM provides significantly greater long-term therapeutic success than a single series of PD (30–35 mm) in treatment-naive achalasia patients. However, GERD-related symptoms and PPI use remain elevated in the POEM group, underscoring the importance of long-term reflux monitoring. Based on these findings, POEM should be considered a first-line treatment option for achalasia.

Werner et al (2019) conducted a multicenter, randomized, open-label, non-inferiority trial across eight European centers (Germany, Italy, Czech Republic, Sweden, the Netherlands, and Belgium) to compare POEM with LHM plus Dor fundoplication in patients with idiopathic achalasia. A total of 221 patients (mean age: 48.6 years) were randomized to receive either POEM (n = 112) or LHM with Dor fundoplication (n = 109). Among those undergoing POEM, achalasia subtypes included: subtype I (n=15; 13.4%); subtype II (n=85; 75.9%); and subtype III (n=12; 10.7%). In the LHM group, subtype I was observed in 21 patients (19.3%), subtype II in 78 patients (71.6%), and subtype III in 9 patients (8.3%). The primary endpoint was clinical success at 2 years, defined as an Eckardt score <3 without additional treatment. Clinical success, defined as an Eckardt score <3 without additional treatment, was achieved in 83.0% of the patients in the POEM group and 81.7% in the LHM group. The difference of 1.4 percentage points met the prespecified non-inferiority margin of −12.5 (P=0.007 for non-inferiority). Serious adverse events were less frequent, but not statistically significant, in the POEM group (2.7% vs. 7.3%). Esophageal function and quality-of-life improvements were comparable between groups; however, reflux esophagitis was more common in the POEM group at both 3- and 24-months. Limitations include the unblinded design, operator experience favoring LHM, and limited enrollment rate with only half of eligible patients participating. The study concluded that POEM is non-inferior to LHM with Dor fundoplication in controlling achalasia symptoms over 2 years. However, POEM was associated with a higher incidence of gastroesophageal reflux, highlighting the need for post-procedural reflux monitoring**.**

Hugova et al (2025) published the 5-year follow-up results of the RTC originally conducted by Werner

and colleagues in 2019, which compared POEM with LHM plus Dor fundoplication in patients with idiopathic achalasia. At 5 years, follow-up data were available for 80% of patients in both groups. Clinical success, defined as an Eckardt score ≤3 without additional treatment, was achieved in 75.0% of patients in the POEM group and 70.8% of patients in the LHM group. This outcome confirms non-inferiority of POEM relative to LHM. The mean reduction in Eckardt score from baseline to 5 years was observed in both groups, with a modest overall difference of −0.29 favoring POEM. Changes in Gastrointestinal Quality of Life Index (GIQLI) scores and integrated relaxation pressure (IRP) on manometry were not significantly different between groups. Reflux symptoms at 5 years were comparable, with mean DeMeester scores of 1.3 (POEM) and 1.1 (LHM). Endoscopic reflux esophagitis was more frequent in the POEM group (41%) than in the LHM group (31%), with Los Angeles grade B or higher esophagitis in 14% (POEM) vs 7% (LHM). Abnormal acid exposure and proton pump inhibitor (PPI) use were consistently higher with POEM group than LHM across all timepoints (baseline: 25% vs 30%, p=.45; 5 years: 53% vs 39%, p=0.0067 respectively). In a post-hoc subgroup analyses of 5-year clinical success, POEM appeared to be more successful in patients with achalasia subtypes II and III, while LHM tended to be more successful in achalasia subtype I; however, these differences did not reach statistical significance. The authors concluded that POEM remains a non-inferior, less invasive alternative to LHM for long-term symptom control in achalasia. However, the higher incidence of reflux esophagitis and PPI use following POEM underscores the importance of ongoing reflux surveillance in these patients.

Two systematic reviews and meta-analyses published in 2021 evaluated the comparative efficacy and safety of POEM, LHM, PD as first-line treatments for achalasia (Dirks 2021; Facciorusso 2021). Both reviews concluded that POEM and LHM offer comparable efficacy, while POEM may provide greater symptom relief and lower retreatment rates than PD. Although POEM was associated with a higher incidence of reflux esophagitis, its overall safety profile was similar to that of LHM and PD. Confidence in these findings was limited by variability in study design, follow-up duration, and quality of evidence.

De Mourna et al (2022) conducted a single center RCT in Brazil comparing POEM to LHM and partial fundoplication (LM-PF) in 40 adult patients with achalasia. Patients were randomly assigned to either POEM (n=20) or LM-PF (n=20) and followed for 12 months. The primary outcome was reflux esophagitis assessed at baseline, 1 month, 6 months, and 1-year post-treatment. At 1-, 6-, and 12-months, Eckardt scores in both groups was significantly lower than baseline (P<0.001), but there were no significant between-group differences observed. Treatment success, defined as an Eckardt score ≤3, was maintained in 100% of LM-PF patients throughout follow-up, while the POEM group showed 100% success at 1 month, declining slightly to 90% at 6 months and 95% at 12 months. Both groups experienced significant improvements in dysphagia, though the between-group difference was not statistically significant (P = 0.547). Reflux esophagitis was significantly more frequent in the POEM group at all time points (P = 0.014, <0.001, and 0.002, respectively). Adverse event rates were similar between groups. POEM was associated with shorter procedure time, reduced hospital stay, and lower postoperative pain scores, but also with a higher incidence of gastroesophageal reflux. Limitations of the study include its single-center design, short follow-up duration, and lack of blinding. The authors concluded that both POEM and LM-PF are equally effective and safe for symptom control in achalasia over 12 months but noted that long-term comparative data

are needed to determine the optimal approach.

Saleh et al (2023) conducted a RCT across three expert achalasia centers in Netherlands, Belgium, and Italy to compare POEM to PD in adult patients with persistent achalasia symptoms after LHM. A total of 90 patients were randomized in a 1:1 ratio, with two patients in the POEM group lost to follow-up. In the POEM group (n=45), achalasia types included type I (n=9), type II (n=15), and type III (n=4). In the PD group (n=45), the distribution was: type I (n=10), type II (n=15), and type III (n=3). The primary outcome was clinical success at 1 year, defined as an Eckardt score <3 without additional treatment. At baseline, both groups had a mean Eckardt score of 6. At 1-year mark, POEM demonstrated significantly higher clinical success compared to PD (P=.001). Reflux symptoms and daily proton pump inhibitor (PPI) use were comparable between groups. However, POEM was associated with significantly greater reductions in basal lower esophageal sphincter pressure and integrated relaxation pressure (IRP-4) (P = .034 and P = .002, respectively). Additionally, barium column height at 2- and 5- minutes post-ingestion was significantly lower in the POEM group (P = .005 and P = .015), indicating improved esophageal emptying. While the rate of serious adverse events was similar between groups, POEM had a higher overall incidence of adverse events (31.1% vs. 20%). Limitations of the study included the lack of blinding in outcome assessment and a follow-up period limited to one year. The authors concluded that POEM may offer superior symptomatic relief and physiological improvement compared to PD in patients with persistent symptoms after LHM, though further long-term data are needed.

Ma et al (2025) conducted a systematic review and meta-analysis to evaluate the long-term outcomes of POEM versus LHM in the treatment of esophageal achalasia. The review included nine studies with a total of 1,099 patients, of whom 583 underwent POEM, with a mean follow-up of 34.2 months. The primary outcome was treatment success, defined as an Eckardt score ≤3. Secondary outcomes included operative time, length of hospital stay, postoperative complications, and gastroesophageal reflux disease (GERD). The analysis found no significant difference in treatment success between POEM and LHM. POEM was associated with a significantly shorter operative time (mean difference −35.7 minutes) and shorter hospital stay (mean difference −0.7 days), with a comparable rate of complications. When outlier studies were excluded, POEM showed a significantly increased risk of esophagitis and higher odds of continued postoperative PPI use. The authors concluded that POEM offers equivalent long-term efficacy to LHM but may carry a higher risk of postoperative GERD. They emphasized the need for additional randomized studies with extended follow-up to better understand the long-term clinical significance of GERD following POEM.

Pedersen et al (2025) aimed to evaluate the long-term clinical efficacy, patient satisfaction, and prevalence of gastroesophageal reflux disease (GERD) following POEM for achalasia over a 10-year period at a single Danish center. This retrospective cohort study included 63 patients treated between 2012 and 2016, with a median follow-up of 10 years. Patients were assessed using the Eckardt-score for achalasia symptoms and the GerdQ-score for GERD symptoms. Clinical success was defined as an Eckardt-score ≤3 with no need for further treatment. The cohort consisted of 44% males, with 57% treatment-naive and others having prior interventions such as pneumatic balloon dilation (40%), Heller's myotomy (24%), or botulinum toxin injections (3%). Achalasia subtypes included type I (30%), type II (35%), and type III (8%), with 22% undetermined. Results showed a significant reduction in mean Eckardt-score from 7.6 pre-POEM to 2.16 at follow-up (p < 0.0001),

with a clinical success rate of 74%. Most failures occurred within three months post-procedure, and no new failures were observed beyond five years. GERD symptoms were reported by 33% of patients, and 60% used proton pump inhibitors, though GERD was not significantly associated with lower satisfaction. Overall, 91% of patients were satisfied or very satisfied. Treatment-naive patients had significantly higher success rates (85%) compared to those with prior Heller's myotomy (40%). Of the patients with clinical failure at follow up, 12 (19%) were non-responders experiencing clinical failure before three months post-POEM. Four patients (6%) experienced clinical failure between three months post-POEM and follow up. Only two patients experienced clinical failure after more than two years (3%), and no patients experienced failure after five years. Limitations included the retrospective design, single-center scope, and small subgroup sizes, particularly for previously treated patients. The study concluded that POEM offers durable symptom relief and high patient satisfaction over a decade, with most failures occurring early and GERD being a common but generally well-tolerated side effect.

Yang and colleagues (2025), representing a North American expert steering committee of 34 experts, conducted a modified Delphi process to address the significant variability in post-procedural care following POEM, largely due to the absence of high-quality evidence. Their goal was to establish consensus on key aspects of post-procedural management for POEM patients. While many experts supported selective use of post-procedural esophagram when complications are suspected, this item did not reach consensus. Consensus was achieved on 23 statements, including:

- All patients should be enrolled in a post-POEM reflux surveillance program, which should follow-up endoscopy and/or pH study to evaluate for esophagitis and/or pathologic acid exposure.
- Patients with LA grade B, C, or D esophagitis should be continued on proton pump inhibitor (PPI) therapy with repeat upper endoscopy in 3 months and thereafter to assess response.
- Patients with persistent esophagitis and/or reflux-like symptoms despite PPI use should undergo additional testing (i.e., pH/ impedance, esophagram) to evaluate for other etiologies, including esophageal acid fermentation and chemical/mechanical hypersensitivity.

<u>Esophageal POEM - Pediatric Achalasia</u>

Miao et al (2017) conducted a retrospective, single-center study to evaluate the safety and efficacy of peroral endoscopic myotomy (POEM) in treating pediatric achalasia. The study included 21 children, aged 11 months to 18 years, who underwent POEM between 2014 and 2016. The mean follow-up duration was 13.2 months. No severe adverse events were reported. All patients showed significant improvement or resolution of feeding and swallowing difficulties. By one-month post-procedure, all had Eckardt scores below 3, and by six months, the average score had decreased from a preoperative mean of 7.18 to 0.75 ($p < .001$). Additionally, patients gained an average of 2.7 kilograms (kg) within six months. At three-month follow-up, four patients developed gastroesophageal reflux, with two cases progressing to reflux esophagitis; all were managed conservatively.

Nabi et al (2019) published a retrospective study assessing POEM for the treatment of children with achalasia. Forty-four patients ≤18 years old and weighing ≥10 kilograms (kg) who were diagnosed with achalasia between 2013 and 2018 were included. POEM was successfully performed in 43

patients (technical success 97.72%). Eleven (25.6%) children experienced intra-operative adverse events, including retroperitoneal carbon dioxide (n=7), capnoperitoneum (n=3), and mucosal injury (n=1). Clinical success at 1, 2, 3, and 4 years of follow-up was 92.8%, 94.4%, 92.3%, and 83.3%, respectively. The study was limited by its retrospective design, the lack of confirmation of GERD in about half the patients, and the small number of patients who completed 3 or more years of follow-up.

Petrosyan et al (2022) conducted a retrospective study of pediatric patients who underwent POEM for achalasia between 2015 to 2021 at Children's National Hospital. The study included 43 children (mean age, 11.6 years) underwent 46 operations (n= 37 POEM and 9 LHM). Follow-up duration ranged from 1 to 74 months, with a median of 15 months. In the POEM group (n = 37), high-resolution esophageal manometry classified achalasia types at diagnosis as follows: type I in 9 patients (24.3%), type II in 25 patients (67.6%), type III in 2 patients (5.9%) and unknown type in 1 patient (2.7%). Sixteen children (43.2%) had prior endoscopic procedures for achalasia prior to POEM. The findings demonstrated symptom improvement, with mean Eckardt scores decreasing from 6.73 preoperatively to 0.6 postoperatively. Intraoperative complications occurred in 43.2% of POEM cases; however, none required reoperation during the initial hospital stay. Postoperative complications were minimal, and the reintervention rate was 16.2%. The authors concluded that POEM is a safe and effective treatment for pediatric achalasia, with outcomes comparable to LHM. Limitations of the study include its retrospective design, single-center scope, and relatively short median follow-up, which may impact the generalizability and assessment of long-term outcomes.

Nabi et al (2023) conducted a systematic review and meta-analysis assessing the outcomes of POEM in pediatric achalasia. The analysis included 14 studies published between 2010 and 2021, comprising 419 patients (234 boys). The mean age across studies ranged from 10.9 to 15.2 years, with symptom duration spanning 6.3 to 30.1 months. The pooled technical success rate was 97.1%. Clinical success, defined as an Eckardt score ≤3, was 88% in the intention-to-treat population and 94.4% in the per-protocol population. Data from nine studies demonstrated a reduction in Eckardt scores from baseline, with a mean difference of 6.71; however, this estimate showed substantial heterogeneity. The overall pooled rate of any adverse event was 12.9%, and the rate of major adverse events was 4.2%. Although the authors concluded that POEM is a safe and effective treatment for pediatric achalasia, they highlighted the need for prospective studies with longer-term follow-up and objective evaluation of gastroesophageal reflux to better assess long-term outcomes.

Bi et al (2023) conducted a retrospective cohort study evaluating the efficacy of POEM in pediatric achalasia, comparing outcomes to a 1:1 matched adult cohort. Matching criteria included gender, operating physician, surgery date, and baseline Chicago and Ling classifications. The study included 48 pediatric patients treated between 2012 and 2020, with a median age of 16 years (range: 7–18 years). Notably, 75% of pediatric patients had no prior treatment for achalasia. Fourteen patients were lost to follow-up, leaving 34 pediatric patients available for long-term evaluation, with a mean follow-up duration of 5.7 years (range: 2.6–10.6 years). Clinical success, defined as a post-POEM Eckardt score <3, was achieved in 97% of cases. Significant improvements were observed in Eckardt scores (8.0 vs. 1.1, $p < .001$), Urbach scores (24.7 vs. 12.8, $p < .001$), and symptoms including dysphagia, regurgitation, chest pain, and weight loss ($p < .001$). Additionally, school absenteeism decreased markedly from a median of 3.3 months pre-POEM to 0.1 months post-POEM ($p < .001$). At

five years post-procedure, adverse events in the pediatric group included symptomatic reflux (17.6%), reflux esophagitis (5.9%), and clinical reflux (11.8%), all of which were managed successfully with medical therapy. When compared to the matched adult cohort (n = 34), pediatric patients demonstrated comparable rates of complications (14.6%), clinical success, symptom improvement, reflux outcomes, and procedure duration.

Repeat Esophageal POEM

In 2024, the American Gastroenterological Association (AGA) Institute's best practice advice states that despite the effectiveness of POEM and LHM in providing durable clinical response for most patients with achalasia, approximately 10%–15% may experience persistent or recurrent symptoms on follow-up (Yang 2024). For management after failed initial myotomy, these patients must undergo a comprehensive evaluation, which, at a minimum, should include repeat HRM, timed barium esophogram, and esophagogastroduodenoscopy.

Tyberg et al (2017) investigated the safety and efficacy of redo POEM in patients who experienced persistent or recurrent symptoms of achalasia following an initial POEM procedure. This multicenter international registry included data from 15 centers across nine countries, encompassing 46 patients (type I, n=10; type II, n=16; type III, n=5; other, n=15) who underwent a second POEM. The primary outcomes were technical success, defined as completion of the myotomy, and clinical success measured by an Eckardt score of 3 or less post-procedure. The study found a 100% technical success rate, with all patients successfully undergoing redo POEM. Clinical success was achieved in 85% of cases, with a significant reduction in mean Eckardt scores from 4.3 before the procedure to 1.64 afterward. This improvement was statistically significant, with a mean score reduction of 2.58 points ($p < .00001$). Adverse events occurred in 17% of patients, all of which were procedural bleeding managed endoscopically. Importantly, there were no deaths, surgical conversions, or aborted procedures. Limitations of the study include lack of standardization of technique across different centers. In addition, only short-term follow-up information was obtained to evaluate for efficacy alone. The authors concluded that redo POEM is a safe and effective treatment option for patients with failed initial POEM, offering high success rates and a low incidence of manageable complications. They suggested that redo POEM could be considered a viable alternative to surgical interventions such as Heller myotomy and recommended further randomized controlled trials to compare these approaches.

Wu et al (2025) conducted a meta-analysis of RTC to compare clinical and safety outcomes between short and long POEM techniques in the treatment of achalasia. The analysis included five RCTs encompassing 518 patients (n=253 in the short POEM group; n=265 in the long POEM group). Baseline characteristics were comparable across studies. Both techniques demonstrated similar rates of clinical success, procedural adverse events, and hospitalization duration. However, short POEM was associated with a significantly shorter procedure time. While symptomatic gastroesophageal reflux disease (GERD) rates were comparable between groups, short POEM showed significantly lower acid exposure time and reduced incidence of erosive esophagitis following sensitivity analysis. The authors noted that insufficient myotomy length may lead to symptom recurrence, particularly in patients with type III achalasia. This finding suggests that repeat POEM may be warranted when the initial myotomy is incomplete or inadequate. The study concludes that short POEM is clinically non-

inferior to long POEM, with added benefits of reduced procedure time and lower objective evidence of GERD.

POEM for Gastroparesis, Gastric POEM (G-POEM)

Kahaleh et al (2018) conducted an international multicenter case series evaluating the use of gastric peroral endoscopic myotomy (G-POEM) for the treatment of refractory gastroparesis. Thirty-three patients with confirmed delayed gastric emptying and elevated Gastroparesis Cardinal Symptom Index (GCSI) scores underwent G-POEM using a submucosal tunneling technique. The procedure was technically successful in all cases, with symptomatic improvement observed in 85% of patients, as mean GCSI scores decreased from 3.3 to 0.8 ($P < 0.001$). Gastric emptying improved significantly, with mean retention times reduced from 222.4 to 143.2 minutes ($P < 0.001$). Adverse events were minimal, including one case of bleeding and one gastric ulcer, both managed conservatively. The average hospital stay was 5.4 days, and the mean follow-up duration was 11.5 months. The authors concluded that G-POEM is a safe, feasible, and effective therapeutic option for patients with refractory gastroparesis, and recommended further comparative studies to validate long-term outcomes and refine patient selection.

Numerous nonrandomized, single-arm studies have been published evaluating G-POEM for refractory gastroparesis (Gregor 2021; Conchillo 2021; Abdelfatah 2021; Labonde 2022; Vosoughi 2022). Collectively, these studies suggest that G-POEM is a technically feasible and generally safe procedure that offers meaningful symptom relief and improved gastric emptying in a substantial proportion of patients with refractory gastroparesis. While individual study designs and follow-up durations vary, most report high technical success rates, moderate to high clinical success, and manageable adverse event profiles. Importantly, symptom improvement tends to be sustained over time in many patients, and subgroup analyses often show better outcomes in those with diabetic gastroparesis compared to idiopathic or postsurgical etiologies. However, because these studies are nonrandomized and single-armed, they are limited by potential biases and lack of control groups. Therefore, while the findings are promising, they underscore the need for more rigorous randomized controlled trials to confirm efficacy, refine patient selection, and compare G-POEM to other treatment modalities.

Hernandez-Mondragon et al (2022) conducted a retrospective analysis of a prospective cohort involving 374 adult patients treated at a single center between 2017 and 2021. Patients were followed for four years and assessed at baseline, one month, six months, and every six months thereafter through 48 months. The procedure had a technical success rate of 100%, with an average hospital length of stay of two days. Prior to treatment with G-POEM, the mean GCSI score was 3.84 ± 0.53, which was significantly reduced to 2.1 ± 0.7 at 4 years follow-up ($n=102$; $p<.001$). The clinical success rate was 77.5% at 4 years follow-up. Adverse events occurred in 8.6% of patients and were managed conservatively or with endoscopic intervention. Treatment failure occurred in 12 patients (3.2%), while 72 patients (19.2%) experienced symptom recurrence. For subgroup analysis, patients were stratified by gastroparesis etiology: diabetic (n = 141; 37.7%), idiopathic (n = 115; 30.7%), postsurgical (n = 102; 27.3%), and other causes (n = 16; 4.3&). Between-group comparisons revealed significant differences in recurrence and clinical success rates, with diabetic gastroparesis showing a lower recurrence rate and a significantly higher final clinical success rate compared to idiopathic, postsurgical, and other etiologies ($p < .01$). The authors concluded that the

study supports G-POEM as a safe and effective long-term treatment for refractory gastroparesis, especially in patients with diabetic etiology. They emphasized the importance of patient selection and suggested that certain clinical factors (e.g., shorter disease duration, lower BMI, and specific symptom profiles) may predict better outcomes.

Martinek et al (2022) published a randomized, multi-center trial that compared G-POEM to sham treatment in patients with gastroparesis. A total of 41 participants were randomized 1:1 to receive either G-POEM (n=21) or sham control (n=20). The median age of patients in the G-POEM arm was 43 years (range, 30 to 51 years) and was 51 years (range, 45 to 56 years) in the sham control group. Participants in the G-POEM group had a higher baseline GCSI score of 3.5 compared to 3.2 in the sham control group. The study was halted early due to significant findings at interim analysis. At 6-months, 71% of patients in the G-POEM group achieved treatment success, defined as a ≥50% reduction in the GCSI, compared to 22% in the sham group (p = 0.005). Gastric emptying improved significantly in the G-POEM group but showed no meaningful change in the sham group. Among the 12 sham patients who later crossed over to receive G-POEM, 75% experienced symptom improvement. Six months after crossover, 9 participants (75%) achieved treatment success. Additionally, a median reduction in GCSI score of 0.3 (95% CI: 0.1 to 1.6) was observed from the time of crossover. Gastric retention decreased significantly in the G-POEM group compared to sham, and similar improvements were seen in crossover patients. Subgroup analysis revealed that patients with diabetic gastroparesis experienced a greater treatment effect than those with post-surgical or idiopathic etiologies.

Gonzalez et al (2024) conducted the first double-blind, RCT with a 1-year follow-up to compare the clinical efficacy of G-POEM versus pyloric botulinum toxin injection (BTI) in patients with refractory gastroparesis. The study included patients with idiopathic (n = 18), diabetic (n = 11), postoperative (n = 6), and mixed (n = 4) etiologies. All participants had undergone at least six months of medical management and had delayed gastric emptying confirmed by scintigraphy. The primary endpoint was clinical efficacy at three months, defined as a reduction of more than one point in the mean Gastroparesis Cardinal Symptom Index (GCSI). Secondary endpoints included one-year efficacy, changes in gastric emptying scintigraphy (GES), adverse events, and quality of life. G-POEM showed a trend toward greater clinical success at three months compared to BTI, and a non-significant advantage at one year in the intention-to-treat analysis. Both groups demonstrated improvement in GCSI scores at three months and one year. GES improvement was observed in 72% of G-POEM patients versus 50% in the BTI group, though the difference was not statistically significant. Only three minor adverse events were reported in the G-POEM group.

Malik et al (2025) conducted a systematic review and meta-analysis to evaluate the efficacy and safety of G-POEM across different gastroparesis etiologies. The analysis included 15 studies (7 retrospective and 8 prospective) involving a total of 982 patients. The authors found that G-POEM was effective and safe across all etiologies, with clinical success rates of 70% for postsurgical, 65% for diabetic, and 60% for idiopathic gastroparesis. G-POEM significantly improved GCSI scores in all groups, with the greatest improvement observed in idiopathic cases (p = .01), followed by postsurgical (p = .038) and diabetic patients (p = .052). Despite some heterogeneity among the included studies, the authors concluded that G-POEM is a viable treatment option for refractory gastroparesis across diverse patient populations.

Dolan et al (2025) conducted a systematic review and meta-analysis to evaluate the efficacy and safety of G-POEM in patients with refractory gastroparesis. The analysis included 20 studies encompassing 797 patients, the majority of whom were female, with an average disease duration exceeding four years. G-POEM demonstrated a technical success rate of 98.5% and was associated with significant symptom improvement. The weighted mean reduction in GCSI score was 1.56 points ($p<0.001$). Gastric retention at four hours improved by approximately 50%, and functional lumen imaging probe (FLIP) measurements showed a significant post-procedure increases in pyloric diameter, distensibility index, and cross-sectional area (all $p < 0.05$). The overall adverse event rate was 10.9%, with most events classified as minor and manageable. The authors concluded that G-POEM is a safe and highly effective intervention, offering durable symptom relief across a range of gastroparesis etiologies and symptom profiles.

POEM for Zenker Diverticulum (Z-POEM)

Yang et al (2020) conducted the first large, international, multicenter retrospective study to evaluate the safety, feasibility, and clinical efficacy of Zenker's peroral endoscopic myotomy (Z-POEM) for treating Zenker's diverticulum (ZD). The study included 75 patients with symptomatic ZD who underwent Z-POEM across five centers between 2016 and 2018. The procedure demonstrated a high technical success rate of 97.3% and a clinical success rate of 92% (66/75), with a significant reduction in mean dysphagia scores from 1.96 to 0.25 ($p < .0001$). Post-procedure, 78.7% of patients had a dysphagia score of 0, 17.3% scored 1, and 4% scored 2. Six patients experienced no improvement, representing clinical failures. Among the 31 patients with 12-month follow-up, only one (3.2%) had symptom recurrence, which was successfully managed with repeat endoscopic diverticulectomy. No symptom recurrence was reported in the 14 patients at 18 months and eight patients at 24 months. The median follow-up duration was 291.5 days. Adverse events occurred in 6.7% of cases (5/75), including one mild bleed and four perforations (one severe, three moderate), all of which were managed conservatively or endoscopically. The authors acknowledged limitations such as the retrospective design, lack of standardized management protocols, and variable follow-up durations. They concluded that Z-POEM appears to be a safe and effective treatment for symptomatic Zenker's diverticulum, with promising early outcomes and durable symptom relief**.**

Two retrospective multicenter studies conducted in the United States evaluated the clinical utility of peroral endoscopic myotomy (Z-POEM) as a therapeutic approach for Zenker's diverticulum. Al Ghamdi et al (2022) analyzed outcomes from 245 patients treated across 12 international centers, including 8 in the United States., comparing Z-POEM, rigid septotomy, and flexible septotomy. The study found no statistically significant difference in clinical success among the three techniques (Z-POEM: 92.7%, rigid: 89.2%, flexible: 86.7%; $P = 0.26$). However, rigid septotomy was associated with a higher rate of adverse events, suggesting a potential safety advantage for Z-POEM and flexible approaches. Mittal et al (2021) retrospectively reviewed 161 cases across 12 tertiary centers in the United States, comparing traditional flexible septotomy (85.1%) with submucosal dissection and myotomy (14.9%), the latter being equivalent to Z-POEM. Both techniques demonstrated high technical success rates (97.1% vs. 95.8%) and comparable clinical success (75.2% vs. 90.9%; $P = 0.16$), with low rates of adverse events. Despite limitations such as retrospective design and variability in technique and follow-up, both studies concluded that flexible endoscopic myotomy, including Z-POEM, is a safe and effective treatment option for Zenker's diverticulum.

Zhang et al (2022) conducted a systematic review and meta-analysis to evaluate the safety and efficacy of POEM for Zenker's diverticulum (Z-POEM) and compare the feasibility and effectiveness with flexible endoscopic septotomy (FES). The analysis included 11 studies published up to July 31, 2021, involving 357 patients who underwent Z-POEM. Study quality was generally high, with five studies rated as high quality and six as moderate. The pooled technical success rate for Z-POEM was 96.3%, and the pooled clinical success rate was 93.0%. Adverse events occurred in 12.4% of cases, while the clinical recurrence rate was 11.2%. Compared to FES, Z-POEM demonstrated a significantly higher clinical success rate (p = 0.004), although no significant differences were found in technical success, adverse event rates, or recurrence rates between the two procedures. The authors concluded that Z-POEM could be an effective and safe therapeutic modality for ZD and even has a slightly higher clinical success rate than FES. However, comparative studies with long-term follow-up will be needed to further confirm our finding.

Swei et al (2023) conducted a prospective study of patients who underwent Z-POEM (n=13) for treatment of Zenker's diverticulum between 2018 and 2020 compared to patients who has previously received FES (n=15) between 2015 and 2018 at a single tertiary academic medical center. Baseline demographics and diverticulum size were comparable between groups. Technical success was achieved in all cases (100%), and overall clinical success was 92.8% (26/28), with no statistically significant difference between Z-POEM (100%) and FES (86.7%, p=0.18). One adverse event occurred in the FES group (dehydration with near syncope; 3.6%). One-year follow-up data were available for 25 patients (Z-POEM: 12; FES: 13), with no significant differences in post-procedure Eckardt scores (p=0.34) or dysphagia scores (p=0.24). Two-year follow-up was available for nine Z-POEM patients, showing a median Eckardt score of 1 and a median dysphagia score of 0, with no need for additional therapy. Limitations include the small sample size, single-center design, and retrospective comparison across different time periods, introducing potential selection and reporting biases. The authors concluded that Z-POEM is a safe and effective alternative to FES, with comparable procedural and clinical outcomes at medium-term follow-up when performed by experienced endoscopists. They recommend larger, prospective, long-term controlled studies to further evaluate these techniques.

Delgado et al (2025) conducted a systematic review and meta-analysis to compare the efficacy and safety of flexible endoscopic septotomy (FES) versus endoscopic submucosal tunneling techniques (ESTTs: Z-POEM and per oral endoscopic septostomy [POES]) in the treatment of Zenker's diverticulum (ZD). The analysis included nine observational comparative studies encompassing 759 patients (304 treated with ESTT and 455 with FES). Outcomes were assessed across subgroups based on follow-up duration (<12 months vs ≥12 months), diverticulum size (<2.5 cm vs ≥2.5 cm), and type of ESTT used. The clinical success rate was significantly higher in the ESTT group (87.36%) compared to the FES group (74.95%) (P < .01). Technical success rates were comparable between groups (ESTT: 95.97%, FES: 96.96%; P = .43), as were initial clinical recurrence rates (P = .08). However, after excluding one study that contributed substantial heterogeneity, clinical recurrence became statistically significant in favor of ESTT. Despite limitations such as study design variability and lack of randomized controlled trials, the authors concluded that ESTT is associated with increased clinical success and a trend toward lower recurrence, making it a safe and effective alternative to FES. The study underscores the need for future large-scale randomized trials to validate

these findings and refine treatment strategies for ZD.

POEM for Esophageal Diverticulum (D-POEM)

Yang et al (2019) conducted the first international, multicenter study to evaluate the feasibility, safety, and efficacy of diverticular peroral endoscopic myotomy (D-POEM) for the management of esophageal diverticula. This retrospective study was carried out across three centers and included 11 patients with symptomatic esophageal diverticula: Zenker's diverticulum (n = 7), epiphrenic diverticula (n = 3), and mid-esophageal diverticulum (n = 1). The mean diverticulum size was 34.5 milimeters. D-POEM was performed using submucosal tunneling techniques similar to standard POEM, allowing complete exposure and dissection of the septum. The procedure achieved a technical success rate of 90.9%, with no reported adverse events. Among the ten patients with available follow-up data, clinical success was achieved in 100%, with sustained symptom relief and a significant reduction in dysphagia scores, from a mean of 2.7 to 0.1 ($p < 0.001$), over a median follow-up of 145 days. Study limitations include retrospective design, small sample size, short follow-up duration, lack of a control group and the inclusion of multiple diverticulum types (Zenker's, epiphrenic, and mid-esophageal). The authors acknowledged that these preliminary results require validation through larger, prospective studies to better define patient selection criteria and assess long-term outcomes.

PROFESSIONAL GUIDELINE(S)

Achalasia

In 2017, the American Gastroenterological Association (AGA) Clinical Practice Updates Committee proposed the following recommendation for the use of POEM for the treatment of achalasia (Kahrilas 2017):

- If expertise is available, POEM should be considered primary therapy for type III achalasia.
- If expertise is available, POEM should be considered comparable to Heller myotomy for any achalasia syndromes.
- Patients receiving POEM should be considered high-risk to develop reflux esophagitis and be advised of management considerations (e.g., proton pump inhibitor therapy and/or surveillance endoscopy) prior to undergoing POEM.

In 2024, the American Gastroenterological Association (AGA) Institute Clinical Practice Update Committee reviewed the available evidence and provided the following expert best practice advice regarding advances in POEM (Yang 2024):

- Best Practice Advice 1: Patients evaluated for POEM should undergo a comprehensive diagnostic workup, which includes clinical history and review of medications, upper endoscopy, timed barium esophagram, and high-resolution manometry. Endoscopic functional luminal impedance planimetry can be a useful adjunct test, particularly in cases when diagnosis is equivocal.
- Best Practice Advice 2: POEM should be considered the preferred treatment for type III achalasia. POEM, LHM, and pneumatic dilation are effective therapies for type I and type II achalasia.

- Best Practice Advice 3: Patients with esophagogastric outflow obstruction alone and/or nonachalasia spastic disorders on manometry should undergo a comprehensive evaluation with correlation of symptoms. Evidence for POEM for these manometric findings are limited and should only be considered on a case-by-case basis after other less invasive approaches have been exhausted.
- Best Practice Advice 9: Pharmacologic acid suppression should be strongly considered in the immediate post-POEM setting, given the increased risk of postprocedure reflux and esophagitis.
- Best Practice Advice 12: POEM may be superior to pneumatic dilation for patients with failed initial POEM or laparoscopic Heller myotomy. For management, these patients must undergo a comprehensive evaluation, which, at a minimum, should include repeat HRM, timed barium esophogram, and esophagogastroduodenoscopy.

In 2020, the American College of Gastroenterology (ACG) issued evidence-based clinical guidelines on the diagnosis and management of achalasia (Vaezi 2020). The evidence review includes the two RCTs of POEM compared to laparoscopic Heller myotomy (LHM) or pneumatic dilation (PD). Based on their evaluation, the ACG made the following recommendations:

- In patients with achalasia who are candidates for definite therapy, PD, LHM, and POEM are comparable effective therapies for type I or type II achalasia and POEM would be a better treatment option in those with type III achalasia.
- We suggest that POEM or PD result in comparable symptomatic improvement in patients with types I or II achalasia. (GRADE quality=Low, Recommendation strength=Conditional)
- We recommend that POEM and LHM result in comparable symptomatic improvement in patients with achalasia. (GRADE quality=Moderate; Recommendation strength=Strong)
- We recommend tailored POEM or LHM for type III achalasia as a more efficacious alternative disruptive therapy at the lower esophageal sphincter compared to PD. (GRADE quality=Moderate; Recommendation strength=Strong)
- We suggest that in patients with achalasia, POEM compared with LHM with fundoplication or PD is associated with a higher incidence of GERD [gastroesophageal reflux disease]. (GRADE quality=Moderate; Recommendation strength=Strong)
- We suggest that POEM is a safe option in patients with achalasia who have previously undergone PD or LHM. (GRADE quality=Low; Recommendation strength=Strong)

In 2018, the International Society for Diseases of the Esophagus published guidelines on the diagnosis and management of achalasia (Zaninotto 2018). The Society convened 51 experts from 11 countries, including several from the U.S., to systematically review evidence and assess recommendations. Conditional recommendations (low to very-low grade of evidence) include:

- POEM is an effective therapy for achalasia both in short- and medium-term follow-up with results comparable to Heller myotomy.
- POEM is an effective therapy for achalasia both in short- and medium-term follow-up with results comparable to PD.

- POEM is feasible and effective for symptom relief in patients previously treated with endoscopic therapies.
- POEM may be considered an option for treating recurrent symptoms after laparoscopic Heller myotomy.

In 2020, the American Society of Gastrointestinal Endoscopy (ASGE) issued an evidence-based guideline on the management of achalasia (Khashab et al 2020). These guidelines were endorsed by the American Neurogastroenterology and Motility Society and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). This guideline did not include either of the two available RCTs of POEM. Based on their evaluation, ASGE issued the following recommendations:

- We suggest POEM as the preferred treatment for management of patients with type III achalasia. (Very low-quality evidence)
- In patients with failed initial myotomy (POEM or laparoscopic Heller myotomy), we suggest PD or redo myotomy using either the same or an alternative myotomy technique (POEM or laparoscopic Heller myotomy). (Very low-quality evidence)
- We suggest that patients undergoing POEM are counseled regarding the increased risk of post procedure reflux compared with PD and laparoscopic Heller myotomy. Based on patient preferences and physician expertise, post procedure management options include objective testing for esophageal acid exposure, long-term acid suppressive therapy, and surveillance upper endoscopy. (Low quality evidence)
- We suggest that POEM and laparoscopic Heller myotomy are comparable treatment options for management of patients with achalasia types I and II, and the treatment option should be based on shared decision-making between the patient and provider. (Low quality evidence)

In 2020, the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) endorsed the guideline on the management of achalasia issued by ASGE (Khashab 2020).

In 2021, SAGES issued its own evidence-based guidelines for the use of POEM for the treatment of achalasia (Kohn 2021). The expert panel agreed on 4 recommendations for adults and children with achalasia. These include:

- The panel suggests that adult and pediatric patients with type I and II achalasia may be treated with either POEM or LHM based on surgeon and patient's shared decision making (conditional recommendation; very low certainty evidence).
- The panel suggests POEM over LHM for type III adult or pediatric achalasia. (expert opinion)
- The panel recommends POEM over PD in patients with achalasia (strong recommendation, moderate certainty evidence)
- For the subgroup of patients who are particularly concerned about the continued use of proton pump inhibitors post-operatively, the panel suggests that either POEM or PD can be used based on joint patient and surgeon decision-making (conditional recommendation, very low certainty evidence).

SAGES updated the guidelines on POEM for achalasia, recognizing that POEM as an increasingly preferred primary therapy for esophageal achalasia, often replacing traditional options such as pneumatic dilation and LHM with fundoplication (Calabrese 2025). Recommendations for POEM include:

- The panel suggests that adult patients with type I and II achalasia may be treated with either POEM with appropriate use of PPI or LHM with fundoplication based on surgeon and patient shared decision-making. (conditional recommendation, low certainty of evidence)
- The panel suggests POEM over LHM for type III adult achalasia. (expert opinion)
- The panel suggests POEM over pneumatic dilatation (conditional recommendation, moderate certainty of evidence).
- Pediatric population recommendations are unchanged from the 2021 guidelines (Kohn), as no new comparative data has been identified since the previous guideline.
    - The panel suggests that pediatric patients with type I and II achalasia may be treated with either POEM or LHM based on surgeon and patient's shared decision making. (conditional recommendation; very low certainty evidence)
    - The panel suggests POEM over LHM for type III pediatric achalasia. (expert opinion)

Gastroparesis

In 2022, the American College of Gastroenterology (ACG) issued clinical guidelines on gastroparesis (Camilleri 2022), making the following recommendations for pyloric intervention:

- Scintigraphic gastric emptying is the standard test for the evaluation of gastroparesis in patients with upper GI symptoms. The suggested method of testing includes appraising the emptying of a solid meal over a duration of 3 hours or greater. (strong recommendation, moderate level of evidence)
- Intrapyloric injection of botulinum toxin is not recommended for patients with gastroparesis based on randomized, controlled trials. (strong recommendation, moderate quality of evidence).
- In patients with gastroparesis with symptoms refractory to medical therapy, we suggest pyloromyotomy over no treatment for symptom control. (conditional recommendation, low quality of evidence)

In 2023, the American Gastroenterological Association (AGA) Institute issued a clinical practice update commentary regarding G-POEM for gastroparesis (Khashab 2023). Based on an expert review, the following recommendations were provided:

- G-POEM should be considered for patients with medically refractory gastroparesis who:
    - have undergo esophagogastroduodenoscopy to confirm no mechanical gastric outlet obstruction
    - had a solid phase gastric emptying scan (GES) confirming delayed gastric emptying, preferably with retention >20% at 4 hours

  - have moderate to severe symptoms including nausea and vomiting as the dominant symptoms on the gastroparesis cardinal symptom index
    - Patients who have failed gastric electrical stimulator therapy, pyloric stenting and botulinum toxin injection should be offered G-POEM but failure of these alternative therapies should not be a prerequisite.

- G-POEM should not be offered to the following patients:
  - Patients with opioid dependence should be weaned off opioids whenever possible and have their gastric emptying re-evaluated.
  - Most patients with postinfectious gastroparesis should not be offered G-POEM.

In 2025, official AGA recommendations were issued on the management of suspected and confirmed gastroparesis, including gastroparesis refractory to medical therapies (Staller 2025). The AGA made the following guidance on G-POEM:

- Recommendation 10: In patients with gastroparesis refractory to medical therapy, the AGA suggests against the routine use of G-POEM. (Conditional recommendation, low certainty of evidence)
  - Comment: As part of shared decision making, patients and clinicians who place a higher value on the potential improvement in symptoms and lower value on the potential risk of adverse events may reasonably select to undergo G-POEM procedure.
  - Implementation Considerations:
    - This procedure should be reserved for select patients with medically refractory gastroparesis.
    - Candidates for G-POEM should have had a diagnosis of gastroparesis with an appropriately done, 4-hour gastric emptying study, generally with at least a moderate delay in gastric emptying (20% retention at 4 hours with the Eggbeaters meal).
    - Candidates for G-POEM should have at least 6–12 months of moderate symptoms with the cardinal symptoms of nausea, vomiting, and/or postprandial fullness.
    - Before consideration of G-POEM, patients with gastroparesis should undergo a trial of other treatments for gastroparesis, including prokinetic agents and antiemetic agents.

REGULATORY STATUS

Peroral endoscopic myotomy uses available laparoscopic instrumentation and, as a surgical procedure, is not subject to regulation by the U.S. Food and Drug Administration.

CODE(S)

- Codes may not be covered under all circumstances.
- Code list may not be all inclusive (AMA and CMS code updates may occur more frequently than policy updates).

- (E/I)=Experimental/Investigational
- (NMN)=Not medically necessary/appropriate

CPT Codes

Code	Description
43180 (*E/I)	Esophagoscopy, rigid, transoral with diverticulectomy of hypopharynx or cervical esophagus (e.g., Zenker's diverticulum), with cricopharyngeal myotomy, includes use of telescope or operating microscope and repair, when performed *E/I for Zenker' diverticulum
43497	Lower esophageal myotomy, transoral (i.e., peroral endoscopic myotomy [POEM])
43499 (*E/I)	Unlisted procedure, esophagus *E/I for POEM for type I or II achalasia
43999 (*E/I)	Unlisted procedure, stomach *E/I for gastric POEM [G-POEM] for gastroparesis

HCPCS Codes

Code	Description
Not Applicable	

ICD10 Codes

Code	Description
K22.5 (E/I)	Diverticulum of esophagus, acquired
K31.84 (E/I)	Gastroparesis
K22.0	Achalasia of cardia

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SEARCH TERMS

Not Applicable

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)

Per oral endoscopic myotomy (POEM) is not addressed in National or Regional Medicare coverage determinations or policies.

PRODUCT DISCLAIMER

- Services are contract dependent; if a product does not cover a service, medical policy criteria do not apply.
- If a commercial product (including an Essential Plan or Child Health Plus product) covers a specific service, medical policy criteria apply to the benefit.
- If a Medicaid product covers a specific service, and there are no New York State Medicaid guidelines (eMedNY) criteria, medical policy criteria apply to the benefit.
- If a Medicare product (including Medicare HMO-Dual Special Needs Program (DSNP) product) covers a specific service, and there is no national or local Medicare coverage decision for the service, medical policy criteria apply to the benefit.
- If a Medicare HMO-Dual Special Needs Program (DSNP) product DOES NOT cover a specific service, please refer to the Medicaid Product coverage line.

POLICY HISTORY/REVISION

Committee Approval Dates	
01/22/26	
Date	**Summary of Changes**
05/15/26	• New policy, initial effective date.