Pediatric Gastric Alimetry

Clinical Policy ID: CCP.1565

Recent review date: 6/2026

Next review date: 10/2027

Policy contains: Gastric alimetry, body surface gastric mapping, pediatric

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Coverage policy

Gastric alimetry and body surface gastric mapping for pediatric populations is considered investigational/not clinically proven and, therefore, not medically necessary.

Limitations

No limitations were identified during the writing of this policy.

Alternative covered services

No alternative covered services were identified during the writing of this policy.

Background

Chronic gastroduodenal symptoms include nausea, vomiting, early satiety, postprandial fullness, and epigastric pain. These symptoms overlap across gastroparesis, functional dyspepsia, and chronic nausea and vomiting

syndromes. In adolescents, these disorders are associated with school absenteeism, nutritional compromise, psychological distress, and repeated acute care use. The direct pediatric evidence base for gastric alimetry and body surface gastric mapping remains limited (Foong, 2023; Humphrey, 2025).

Gastric emptying scintigraphy remains a guideline-supported method for evaluating suspected gastroparesis, but it measures the gastric emptying rate rather than the underlying gastric electrical activity that coordinates contractions. Published reviews and comparative studies describe limited correlation between emptying results and symptom severity, variable results on repeat testing, and a subgroup of symptomatic individuals with normal emptying. These limitations have motivated interest in complementary physiologic tests (Camilleri, 2022; Lacy, 2022; Wang, 2024).

Antroduodenal manometry can evaluate gastric and small bowel neuromuscular function, but it is invasive, usually requires specialized motility expertise, and is not widely available. Its test burden is a particular consideration for children and adolescents. These limitations have prompted interest in noninvasive mapping approaches (Humphrey, 2025; Malagelada, 2025).

Technology and biomarkers

Body surface gastric mapping, performed with gastric alimetry, is a noninvasive test that records gastric myoelectrical activity from the abdominal skin surface while symptoms are logged during testing. The system uses 64 electrodes arranged in an 8 by 8 grid, a wearable signal reader, and a symptom logging application. A typical adult protocol includes a 30-minute fasting baseline, a standardized 482-kilocalorie meal, and a 4-hour postprandial recording period (Foong, 2023).

Food and Drug Administration materials identify the system as a class II electrogastrography system under 21 Code of Federal Regulations 876.1735 and product code MYE. The 2024 510(k) clearance states that the system is intended to record, store, view, and process gastric myoelectrical activity as an aid in the diagnosis of various gastric disorders and is indicated for patients aged 12 years and older. The 2025 510(k) clearance retained the same intended use and age indication while describing modifications to signal processing, symptom subgroup reporting, adolescent gut-brain wellbeing questions, quality cautions, and report presentation (U.S. Food and Drug Administration, 2024, 2025).

Compared with conventional electrogastrography, body surface gastric mapping uses higher-resolution spatial mapping and spectral analysis to characterize gastric rhythm, amplitude, and meal response (Foong, 2023). The commonly reported spectral biomarkers are the following:

- Principal gastric frequency: the dominant rhythm of gastric slow-wave activity, with an adult reference interval of 2.65 to 3.35 cycles per minute.
- Gastric alimetry rhythm index: a measure of rhythm stability, with an adult reference value of 0.25 or greater.
- Body mass index-adjusted amplitude: the strength of the gastric electrical signal, with an adult reference interval of 20 to 70 microvolts.
- Fed-to-fasted amplitude ratio: the meal response of the stomach, with an adult reference value of 1.08 or greater.

Findings

Available peer-reviewed evidence supports continued classification of gastric alimetry and body surface gastric mapping as investigational for pediatric and adolescent coverage for refractory gastroparesis, chronic nausea and vomiting syndrome, or suspected gastric dysmotility after failed initial medical management. Direct pediatric and adolescent evidence includes one prospective cross-sectional study in symptomatic adolescents and young adults and one healthy-adolescent normative study. These studies support preliminary clinical validity and reference interval development, but they do not show that test-guided management improves symptoms, quality of life, school attendance, health care utilization, avoidance of invasive testing, or other patient-centered outcomes in individuals aged 12 to 17 years (Humphrey, 2025; Humphrey, 2026).

Guidelines

No identified pediatric guideline recommends gastric alimetry and body surface gastric mapping for refractory gastroparesis, chronic nausea and vomiting syndrome, or suspected gastric dysmotility. Current peer-reviewed society guidelines continue to anchor gastroparesis diagnosis to direct gastric emptying measurement. The American Gastroenterological Association recommends 4-hour gastric emptying testing, rather than 2-hour or shorter testing, when evaluating delayed gastric emptying (Staller, 2025).

A European consensus guideline states that a gastric emptying test is necessary to establish gastroparesis in unexplained chronic nausea and vomiting and identifies scintigraphy and octanoic acid breath testing as valid solid gastric emptying methods. The same guideline notes that antroduodenal manometry and other intestinal motility tests may be considered when symptoms suggest intestinal dysmotility, after obstruction and mucosal disorders are excluded, but such testing is limited to specialized settings. Neither guideline establishes body surface gastric mapping as a replacement or routine adjunct diagnostic test (Malagelada, 2025).

Systematic reviews

No systematic review focused specifically on gastric alimetry and body surface gastric mapping in pediatric or adolescent participants was identified. The available pediatric systematic review evaluated legacy electrogastrography, not the current high-resolution mapping device. It included 33 studies and 1,444 participants, comprising 947 participants with gastrointestinal disorders and 497 healthy controls. The review found variable methodology, wide reference ranges, few poolable studies, and no pediatric high-resolution body surface mapping studies at the time of review (Bhat, 2021).

The systematic review supports the biologic plausibility that gastric electrophysiologic abnormalities occur in pediatric gastroduodenal disorders, but it does not establish clinical utility for gastric alimetry and body surface gastric mapping. The review concluded that standardized and more reliable recording methods were needed to define the clinical significance of electrophysiologic findings, which supports further study rather than routine coverage in adolescents with refractory symptoms (Bhat, 2021).

Meta-analysis

No meta-analysis of gastric alimetry and body surface gastric mapping in pediatric or adolescent participants was identified. The only pediatric meta-analytic evidence addressed legacy electrogastrography. In functional dyspepsia, three studies included 82 participants, and the pooled prevalence of any electrogastrography abnormality was 74% (95% confidence interval [CI], 60% to 91%; I2 = 67%). Participants with functional dyspepsia spent 20.8% less preprandial time in normogastria (P = 0.011) and 21.6% less postprandial time in normogastria (P = 0.031) than controls (Bhat, 2021).

For type 1 diabetes mellitus, four studies included 241 participants. Participants with type 1 diabetes mellitus spent 46.2% less preprandial time in normogastria (P = 0.0003) and had a lower power ratio (standardized mean difference, -2.20; 95% CI, -4.25 to -0.15; P = 0.036) than controls. Heterogeneity was substantial across several

outcomes, and symptom correlations were inconsistently reported. These pooled findings provide indirect support for electrophysiologic abnormalities in children and adolescents, but they do not show that high-resolution mapping changes management or improves outcomes (Bhat, 2021).

Other studies

Symptomatic adolescent study

The most directly applicable symptomatic study prospectively evaluated 56 participants aged 12 to 21 years, including 31 healthy controls and 25 participants with functional dyspepsia or gastroparesis. The symptomatic cohort had a median age of 16.1 years, and the study did not report separate outcomes restricted to ages 12 to 17 years. Body surface gastric mapping identified three phenotypes among symptomatic participants: normal mapping (n = 10), delayed mapping (n = 8), and low stability/low amplitude (n = 7). The phenotypes did not align with functional dyspepsia versus gastroparesis labels based on Rome IV criteria and gastric emptying testing (Humphrey, 2025).

Phenotype differences were associated with clinical measures, but the findings were exploratory. The low stability/low amplitude group had lower amplitude and gastric rhythm index values than the other phenotype groups and had higher nausea, worse physical health or functional disability, and higher anxiety scores. Median body mass index-adjusted amplitude differed across groups at 34.6, 39.1, and 19.9 microvolts (P = 0.01), and gastric rhythm index differed at 0.45, 0.45, and 0.19 (P = 0.003). Nausea differed across phenotypes (P = 0.04), as did physical health or functional disability (P = 0.04) and anxiety (P = 0.03) (Humphrey, 2025).

Adolescent normative study

A multicenter healthy-adolescent study established spectral reference intervals for ages 12 to 17 years. The study enrolled 123 healthy adolescents, excluded 16 after testing because of symptoms greater than 3 out of 10 or excessive artifact, and analyzed 107. Reported reference intervals included principal gastric frequency 2.72 to 3.37 cycles per minute, body mass index-adjusted amplitude 20.0 to 72.0 microvolts, gastric rhythm index at least 0.22, and fed-to-fasted amplitude ratio at least 1.0. Cross-validation found that 3% to 8% of test-set observations fell outside reference thresholds (Humphrey, 2026).

Normative evidence improves interpretability for adolescents, but it does not establish clinical utility for symptomatic adolescents. The healthy cohort excluded chronic illness, psychiatric diagnoses, active gastrointestinal symptoms, medications affecting motility, prior upper gastrointestinal surgery, body mass index greater than 35 kg/m2, relevant skin conditions, and adhesive allergy. These exclusions differ from the clinical population described in the policy question, in which refractory symptoms, comorbidity, medication exposure, nutritional compromise, and prior testing are common (Humphrey, 2026).

Adult studies

Adult studies provide indirect context but cannot substitute for pediatric clinical utility evidence. An adult case-control study compared 43 participants with chronic nausea and vomiting syndromes with 43 matched controls. The symptomatic group had lower postprandial amplitude, lower fed-to-fasting ratio, and lower spatial frequency stability. In the abnormal mapping group, mapping metrics correlated with nausea, pain, fullness, early satiety, bloating, heartburn, and gastroparesis symptom scores (Gharibans, 2022).

A prospective adult comparison with simultaneous gastric emptying scintigraphy enrolled 75 participants with chronic gastroduodenal symptoms. Gastric emptying was abnormal in 17 of 75 participants, while mapping spectral abnormalities were identified in 25 of 75. Mapping plus symptom profiling classified 47 of 75 participants (62.7%), compared with 17 of 75 (22.7%) by scintigraphy alone (P < 0.0001). The study did not evaluate pediatric participants or mapping-guided treatment outcomes (Wang, 2024).

A randomized prospective adult pilot study with 16 participants found that adding mapping to scintigraphy increased clinician diagnostic certainty from a median of 6.5 to 8.0 on a 0 to 10 scale ($P < 0.001$) and management certainty from 6.0 to 7.5 ($P = 0.015$). Additional management changes occurred in 6 of 8 participants when mapping followed scintigraphy and in 5 of 8 when scintigraphy followed mapping. The study did not evaluate whether management changes improved symptoms, utilization, or other health outcomes (Abraham, 2026).

Pediatric evidence gaps

The main pediatric evidence gap is the absence of prospective studies showing improved health outcomes after mapping-guided management. No identified pediatric randomized trial, comparative effectiveness study, or longitudinal cohort evaluated phenotype-directed medication, dietary management, psychological therapy, enteral access decisions, gastric electrical stimulation selection, reduced diagnostic testing, or reduced utilization. Several mapping studies also disclosed intellectual property, equity, employment, or other financial relationships with the device manufacturer, which increases the need for independent replication (Gharibans, 2022; Humphrey, 2025; Humphrey, 2026; Wang, 2024).

For adolescents aged 12 to 17 years, peer-reviewed evidence supports preliminary clinical validity but not established clinical utility. Mapping can generate adolescent reference intervals and identify physiologic phenotypes among adolescents and young adults with functional dyspepsia or gastroparesis, but it has not been shown to change pediatric management in a way that improves outcomes or to warrant replacing or routinely supplementing guideline-supported gastric emptying testing (Humphrey, 2025; Humphrey, 2026; Malagelada, 2025; Staller, 2025).

References

On June 11, 2026, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were: gastric alimetry; body surface gastric mapping; high-resolution electrogastrography; gastric myoelectrical activity; gastroparesis; functional dyspepsia; chronic nausea and vomiting; gastric dysmotility; gastroduodenal; gastric emptying; electrogastrography; pediatric; adolescent; children We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

Initial review date: 6/2026 and clinical policy effective date: 8/2026

7/2026: Policy created.

Related codes

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy CCP.1565. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

Code	Code description
0868T	gastric alimetry and body surface gastric mapping