PEDIATRIC COMPLEX CARE PLATFORM | منصة رعاية الأطفال ذوي الحالات الطبية المعقدة

CLINICAL GUIDELINE · PEDIATRIC COMPLEX CARE PLATFORM

Gastroparesis in Children

Diagnosis, nutritional and pharmacological management, and approach to refractory gastroparesis in children

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Intended for healthcare professionals as a clinical reference. Apply with clinical judgment and in line with local protocols.

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1 Definition

Gastroparesis

A gastric motility disorder characterized by **upper gastrointestinal symptoms** associated with **objectively documented delayed gastric emptying of solids**, in the **absence of mechanical obstruction**.

The degree of delayed gastric emptying does not necessarily correlate with symptom severity.

2 Etiology

In children, the cause is frequently **idiopathic**; the precise distribution of etiologies remains uncertain because pediatric evidence is predominantly retrospective. Recognized causes include:

Idiopathic | **Post-infectious** | **Post-surgical / vagal injury** | **Diabetes mellitus** | **Neurologic / neuromuscular disorders** | **Autonomic dysfunction** | **Connective-tissue / systemic disorders** | **Medication-induced ↓**

Medications that may cause or worsen delayed gastric emptying: opioids, anticholinergic medications (including strongly anticholinergic TCAs and first-generation antihistamines), GLP-1 receptor agonists, pramlintide and octreotide. Others reported to impair gastric emptying include α_2-adrenergic agonists and some calcium-channel blockers.

3 Clinical Presentation

Consider gastroparesis in a child with persistent:

- Nausea and/or vomiting.
- Early satiety.
- Postprandial fullness.
- Upper abdominal pain or discomfort.
- Bloating.
- Reduced oral intake.
- Weight loss or poor weight gain / growth faltering.

Symptoms are not diagnostic. Objective demonstration of delayed gastric emptying is required.

GERD may coexist with gastroparesis, and delayed gastric emptying may contribute to or exacerbate gastroesophageal reflux.

4 Differential Diagnosis

- Mechanical gastric / intestinal obstruction
- Peptic disease / gastritis / esophagitis
- GERD
- Functional dyspepsia
- Rumination syndrome
- Cyclic vomiting syndrome
- Disorders of gut–brain interaction
- Constipation
- Feeding / eating disorder
- SIBO
- Medication adverse effects
- Metabolic / endocrine disease
- CNS causes of vomiting

5 Diagnostic Evaluation

Step 1 · Clinical assessment

- History and physical examination.
- Growth and nutritional assessment.
- Medication review, particularly drugs that may delay gastric emptying.
- Assess for underlying or contributing conditions, including post-infectious, neurologic, metabolic/endocrine and postsurgical causes.
- Assess for dehydration, electrolyte disturbances and other complications of reduced intake or gastrointestinal losses.

Laboratory investigations should be guided by the clinical presentation rather than routinely performed in every child.

Step 2 · Exclude mechanical / structural disease

Perform upper GI contrast imaging and/or upper GI endoscopy **when clinically indicated** by the history, examination or red flags.

These investigations are not routinely required before gastric-emptying testing and should be performed when clinically indicated.

Before gastric-emptying testing (where clinically safe):

- Withhold medications that significantly alter gastric emptying according to their pharmacokinetics/local protocol.
- Avoid significant hyperglycemia during testing, as acute hyperglycemia can delay gastric emptying and affect test interpretation.
- Follow the standardized meal and imaging protocol.

Step 3 · Demonstrate delayed gastric emptying

Preferred test: 4-hour solid-meal gastric emptying scintigraphy (GES), using a standardized solid meal and a validated institutional protocol.

The 4-hour study has greater diagnostic yield than shorter studies: in a 2025 pediatric meta-analysis, extending GES from 2 to 4 hours identified approximately **10% additional children** with gastroparesis.

Commonly used criterion for delay

>10% retention

at 4 hours

Where available, a validated **^{13}C gastric-emptying breath test** may be considered as a radiation-free alternative.

6 General Management

Treatment goals

- ✓ Identify and treat reversible causes.
- ✓ Correct dehydration and electrolyte abnormalities.
- ✓ Maintain adequate nutrition and growth.
- ✓ Reduce symptoms.
- ✓ Improve functional status and quality of life.
- ✓ Minimize medications that delay gastric emptying where possible.

! **Consider hospitalization** for severe dehydration, electrolyte abnormalities, inability to maintain adequate nutrition, or intractable symptoms.

7 Nutrition and Dietary Management

Nutrition is first-line therapy.

Recommend

- ✓ Small, frequent meals.
- ✓ **Small-particle / soft-texture** foods.
- ✓ Reduce high-fat solid foods.
- ✓ Reduce poorly digestible / high-fiber foods if they worsen symptoms.
- ✓ Consider liquid calories when solids are poorly tolerated.
- ✓ Maintain adequate hydration.
- ✓ Dietitian referral when symptoms are persistent or nutritional status is affected.
- ✓ Optimize glycemic control in children with diabetes.

Nutrition escalation

1. **Oral diet**
2. **Oral liquid nutritional supplementation**
3. **Post-pyloric enteral feeding**
   NJ feeding trial when gastric feeding is poorly tolerated.
4. **Long-term jejunal feeding**
   GJ tube or jejunostomy when prolonged post-pyloric feeding is required.
5. **Parenteral nutrition**
   Only when adequate nutrition cannot be achieved enterally.

Pediatric evidence supports dietary modification and post-pyloric enteral feeding as major components of management, although high-quality pediatric trials remain limited.

8 Pharmacological Treatment

Consider pharmacological treatment when clinically significant symptoms persist despite appropriate dietary measures.

8.1 Prokinetics

1 · Metoclopramide — Initial option

Dopamine D_2 antagonist with prokinetic and antiemetic activity.

Monitor for:

- Acute dystonic reactions, akathisia and other extrapyramidal symptoms.
- Hyperprolactinemia.
- Tardive dyskinesia with prolonged exposure.

Use the **lowest effective dose for the shortest appropriate duration** (generally ≤12 weeks), with periodic reassessment of benefit versus adverse effects.

2 · Erythromycin — Initial option

Motilin-receptor agonist; accelerates gastric emptying.

Most useful **short-term**, because tachyphylaxis commonly develops with continued treatment.

Consider:

- QT prolongation and drug interactions.
- Antimicrobial exposure / resistance.
- Increased risk of hypertrophic pyloric stenosis with early infant exposure.

3 · Domperidone — Alternative option

Peripheral D_2 antagonist with prokinetic effects; consider as an alternative when metoclopramide is ineffective or not tolerated.

Consider:

- QT prolongation and cardiac arrhythmia risk.
- Drug interactions; hyperprolactinemia.

ECG/electrolyte assessment according to patient risk factors and local policy.

4 · Other prokinetics — Not routine

- **Prucalopride**: not routine first-line; consider only in selected refractory cases after pediatric gastroenterology/motility assessment.
- **Cisapride**: not recommended for routine treatment because of cardiac toxicity and restricted availability.

Current AGA guidance conditionally supports metoclopramide and erythromycin as initial pharmacologic treatments; the supporting evidence is of low/very-low certainty and predominantly adult-derived.

8.2 Symptomatic treatment

Antiemetics

Reduce nausea and vomiting but **do not correct delayed gastric emptying**.

- Ondansetron.
- Other antiemetics selected according to the child's age, clinical situation and adverse-effect profile.

Consider cumulative risks of QT prolongation, sedation, extrapyramidal effects and drug interactions.

Acid suppression

PPIs / H_2-receptor antagonists **do not treat gastroparesis**.

Use only when there is an independent indication, such as clinically significant acid-related disease or GERD.

9 Refractory Gastroparesis

Children with persistent severe symptoms, growth failure or inadequate nutrition despite optimized treatment should be referred to **Pediatric Gastroenterology / a pediatric motility service**.

Before escalation, reconfirm the diagnosis and reassess for:

- ✓ Medication effects
- ✓ Mechanical disease
- ✓ Functional dyspepsia
- ✓ Rumination syndrome
- ✓ Cyclic vomiting syndrome
- ✓ Constipation
- ✓ Feeding / eating disorder
- ✓ Other GI or systemic disease

Intrapyloric botulinum toxin

Not recommended routinely. Adult randomized trials have not shown consistent benefit, and the 2025 AGA guideline recommends against routine use. Pediatric observational data suggest possible benefit in selected children, but evidence is insufficient for routine treatment. May be considered in highly selected refractory cases after pediatric motility specialist assessment.

G-POEM

Gastric peroral endoscopic pyloromyotomy should **not be routinely offered** to children. The 2025 AGA guideline recommends against its routine *initial* use, reserving it for medically refractory disease. In children, it may be considered in highly selected, severe refractory disease at an experienced specialist center; pediatric evidence remains limited.

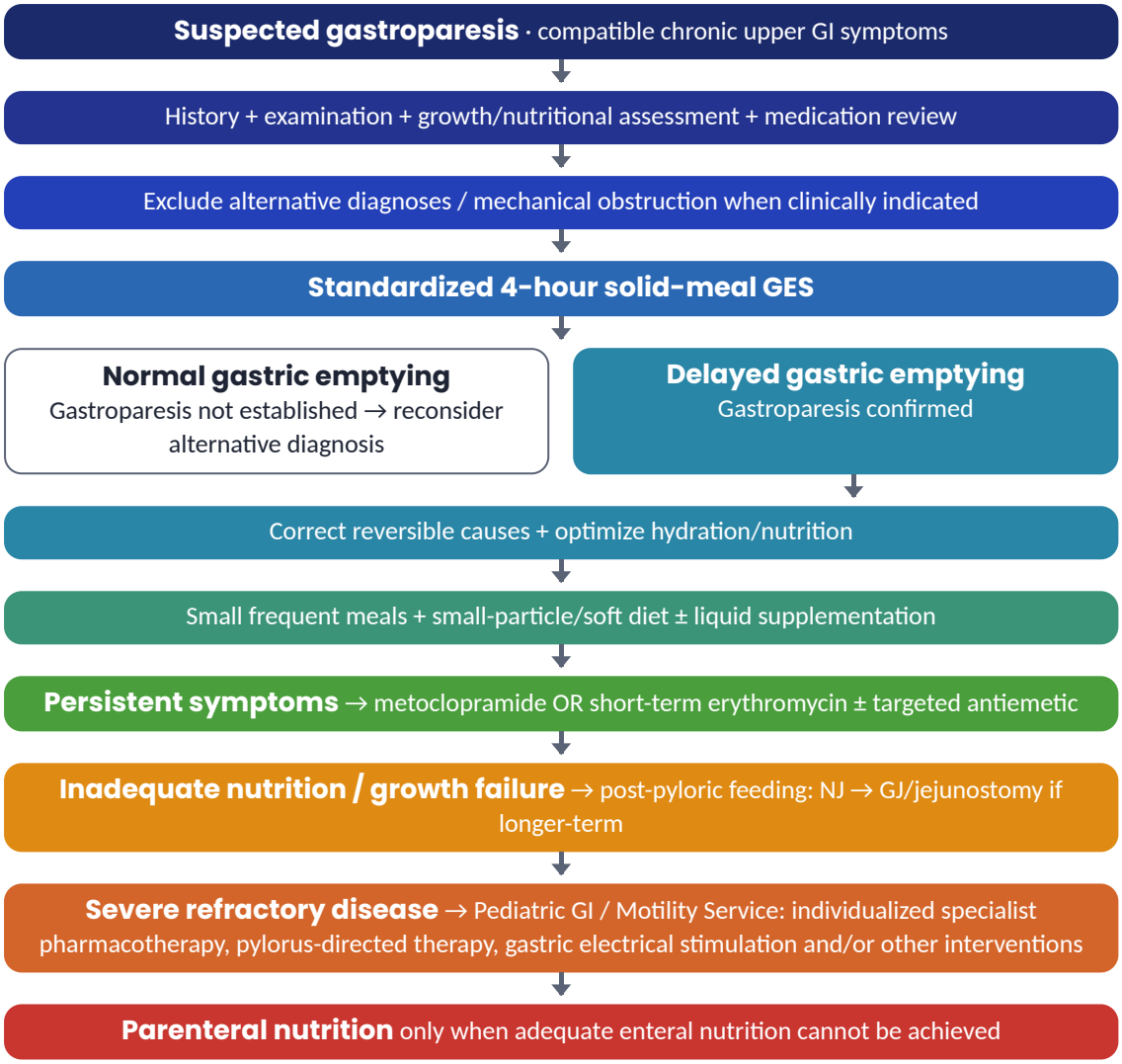
Gastric electrical stimulation

May be considered in highly selected severe refractory cases at specialist centers. Evidence in children remains limited, and routine use is not recommended.

Venting gastrostomy

May provide symptomatic relief in selected patients with significant gastric distension, vomiting or feeding intolerance. It does not directly correct delayed gastric emptying. A GJ tube may additionally provide gastric venting while permitting jejunal nutrition.

10 Practical Management Algorithm



11 Key Practice Points

1. Symptoms alone do not diagnose gastroparesis.
2. Diagnosis requires objective delayed gastric emptying in the absence of mechanical obstruction.
3. 4-hour solid-meal GES is the preferred diagnostic test.
4. Nutrition and dietary modification are first-line treatment.
5. Metoclopramide or erythromycin may be considered when pharmacological therapy is required.
6. Antiemetics treat symptoms but do not improve gastric emptying.
7. Post-pyloric enteral nutrition is preferred over parenteral nutrition when gastric feeding fails.
8. Botulinum toxin, G-POEM and gastric electrical stimulation are not routine therapies; reserve for carefully selected refractory cases in specialist centers.
9. Pediatric evidence remains substantially weaker than adult evidence; management should be individualized and specialist-directed in severe or refractory disease.

12 References

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