

## AAP Releases Guideline for the Management of Gastroesophageal Reflux in Children

**Guideline source:** American Academy of Pediatrics

**Evidence rating system used?** No

**Literature search described?** No

**Guideline developed by participants without relevant financial ties to industry?** Not reported

**Available at:** <http://pediatrics.aappublications.org/content/131/5/e1684.full>

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The American Academy of Pediatrics (AAP) has published a guideline on the management of gastroesophageal reflux (GER) in children based on recommendations from the North American and European Societies for Pediatric Gastroenterology, Hepatology, and Nutrition. It is important to determine whether the patient has gastroesophageal reflux disease (GERD) to facilitate appropriate treatment and to determine which patients need to be referred to a gastroenterologist. GER is defined as the physiologic passage of gastric contents into the esophagus and generally requires conservative management. GERD is reflux associated with troublesome symptoms or complications and may require further evaluation and treatment.

### Diagnosis

#### CLINICAL FEATURES OF GERD

Troublesome symptoms or complications of reflux in full-term infants include feeding refusal, recurrent vomiting, poor weight gain, irritability, sleep disturbance, and respiratory symptoms. GERD in infants can also be associated with coughing, choking, wheezing, or upper respiratory tract symptoms. However, relying on symptoms to diagnose GERD can be difficult in infants, especially because medication does not always resolve symptoms. Rates of GERD are reportedly lower in breast-fed infants compared with formula-fed infants, and the incidence peaks at four months of age.

Common troublesome symptoms and complications in children older than one year and in adolescents include abdominal pain or heartburn, recurrent vomiting, dysphagia, asthma, recurrent pneumonia, and upper airway symptoms (e.g., chronic cough, hoarseness).

#### DIAGNOSTIC STUDIES

In most children, and especially in adolescents, diagnostic studies are not needed to diagnose uncomplicated GER and GERD. However, a clinical history and physical examination are important to detect warning signs of more serious conditions. Warning signs include bilious vomiting, gastrointestinal tract bleeding, consistently forceful vomiting, fever, lethargy, hepatosplenomegaly, bulging fontanelle, macro- or microcephaly, seizures, abdominal tenderness or distension, genetic or metabolic syndrome, and associated chronic disease.

If used, diagnostic tests should be thought out and performed in a manner that can help establish a causal relationship between reflux and symptoms, to evaluate the effectiveness of treatment, and to exclude other diagnoses. Upper gastrointestinal tract radiography assesses the anatomy and can possibly document a motility disorder. Esophageal pH monitoring and intraluminal esophageal impedance can quantify GER. Upper endoscopy with esophageal biopsy is the primary method for excluding other conditions that can mimic the symptoms of GERD and evaluate for GERD-related esophageal injury. Other options include multichannel intraluminal impedance monitoring and scintigraphy.

### Treatment

#### LIFESTYLE MODIFICATION

In infants with complicated GER or GERD, feeding changes may minimize symptoms.

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These changes include modifying maternal diet in breastfed infants and changing formula in formula-fed infants, reducing feeding volume while increasing feeding frequency, and thickening formula. A two- to four-week trial of a maternal exclusion diet that restricts at least milk and egg is recommended in breastfeeding infants with GERD symptoms, whereas an extensively hydrolyzed protein or amino acid–based formula may be appropriate in formula-fed infants. Thickening feedings may reduce symptoms, but there is concern for an increased risk of necrotizing enterocolitis in preterm infants. Keeping infants in an upright or prone position

may also be effective, although only when awake and under supervision.

Older children and adolescents with GERD may benefit from losing weight if needed, not smoking or using alcohol, avoiding foods that may trigger symptoms, and chewing sugarless gum. Positioning changes may be helpful, but are not as well studied as in infants.

### PHARMACOTHERAPY

Acid suppressants or prokinetic agents may be used to treat GERD in infants and children. *Table 1* includes child dosages of GERD medications. Acid suppressants,

**Table 1. Child Dosages for GERD Medications**

<i>Medications</i>	<i>Dosages</i>	<i>Formulations</i>	<i>Ages*</i>
<b>Histamine H<sub>2</sub> antagonists</b>			
Cimetidine	30 to 40 mg per kg per day, divided into 4 doses	Syrup	16 years or older
Famotidine (Pepcid)	1 mg per kg per day, divided into 2 doses	Cherry-banana-mint-flavored oral suspension	1 to 16 years
Nizatidine (Axid)	10 mg per kg per day, divided into 2 doses	Bubble gum-flavored solution	12 years or older
Ranitidine (Zantac)	5 to 10 mg per kg per day, divided into 2 or 3 doses	Peppermint-flavored syrup Effervescent tablet	1 month to 16 years
<b>Proton pump inhibitors</b>			
Dexlansoprazole (Dexilant)	30 to 60 mg daily (adult dose)	Oral tablet	No pediatric indication
Esomeprazole (Nexium)	0.7 to 3.3 mg per kg per day	Sprinkle contents of capsule onto soft foods Administer capsule contents in juice through nasogastric tube	1 to 17 years
Lansoprazole (Prevacid)	0.7 to 3 mg per kg per day	Sprinkle contents of capsule onto soft foods or select juices Administer capsule contents in juice through nasogastric tube Strawberry-flavored disintegrating tablet Orally disintegrating tablet via oral syringe or nasogastric tube	1 to 17 years
Omeprazole (Prilosec)	0.7 to 3.3 mg per kg per day	Sprinkle contents of capsule onto soft foods	2 to 16 years
Pantoprazole (Protonix)	40 mg daily (adult dose)	Oral tablet	No pediatric indication
Rabeprazole (Aciphex)	20 mg daily	Oral tablet	12 to 17 years

GERD = gastroesophageal reflux disease.

\*—Indicated by the U.S. Food and Drug Administration.

Adapted with permission from Lightdale JR, Gremse DA. Gastroesophageal reflux: management guidance for the pediatrician. *Pediatrics*. 2013; 131(5):e1690.

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which include antacids, histamine H<sub>2</sub> antagonists, and proton pump inhibitors, are more commonly used because of growing evidence that they are more effective than prokinetic agents; however, there is significant concern about the overprescription of acid suppressants, especially proton pump inhibitors. Because of risks, chronic antacid therapy is generally not recommended to treat GERD in children.

H<sub>2</sub> antagonists are effective, but long-term use is limited. They can cause tachyphylaxis within six weeks and may increase the risk of liver disease and gynecomastia. Proton pump inhibitors are the most potent acid suppressants and are superior to H<sub>2</sub> antagonists. Effectiveness is related to timing of dosing (ideally, about 30 minutes before meals), and the metabolism of proton pump inhibitors differs in children compared with adults. Evidence suggests that acid suppression, with H<sub>2</sub> antagonists or proton pump inhibitors, may be a risk factor for community-acquired pneumonia, gastroenteritis, candidemia, and necrotizing enterocolitis in preterm infants.

Prokinetic agents can decrease GERD symptoms by improving contractility of the body of the esophagus, increasing lower esophageal sphincter pressure, and increasing the rate of gastric emptying. However, the benefits of these agents may not outweigh the adverse effects, which include drowsiness, restlessness, and extrapyramidal reactions. There is insufficient evidence to support the routine use of prokinetic agents for GERD in children.

### SURGERY

Fundoplication (i.e., the gastric fundus is wrapped around the distal esophagus) is the most common surgical intervention to prevent reflux in children. Total esophagogastric dissociation is rarely used if fundoplication is ineffective. Both procedures are associated with significant morbidity and are used only in carefully selected patients who have not improved with pharmacologic treatment or who have severe risk of aspiration of gastric contents. Before surgery, other etiologies should be carefully considered, and parents should be counseled about realistic expectations from surgery.

AMBER RANDEL, AAFP Senior Associate Editor ■

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