

SUMMARY OF THE 2009 PEDIATRIC GASTROESOPHAGEAL REFLUX CLINICAL PRACTICE GUIDELINES¹

GERD GUIDELINE SUMMARY FACULTY: Benjamin D. Gold, MD, Philip Sherman, MD and Eric Hassall, MD

SCIENCE WRITER: Paul Sinclair (*INSINC Consulting Inc. Guelph, Ontario, Canada*)

PURPOSE

This Clinical Practice Guideline Summary was developed to assist the primary and specialist healthcare provider in the evaluation and management of gastroesophageal reflux (GER) and gastroesophageal reflux disease (GERD) in the pediatric age group – infants, children and adolescents. The Guidelines¹ are recommendations based on the best available evidence from the literature combined with expert opinion, and were developed using a validated consensus-based methodology. They were written by a joint committee of experts from the North American and European Societies for Pediatric Gastroenterology, Hepatology and Nutrition - NASPGHAN and ESPGHAN, respectively.

The recommendations are a general guideline and are not intended as a substitute for clinical judgment or as a protocol for the management of all patients with gastroesophageal reflux, or gastroesophageal reflux disease.

DEFINITIONS

- Gastroesophageal reflux (GER): the passage of gastric contents into the esophagus with or without regurgitation or vomiting, i.e. ejection of contents from the mouth. GER is a normal, i.e. physiologic process which can occur several times per day in healthy infants, and to a lesser frequency in children, and adults.
- Gastroesophageal reflux disease (GERD): the presence of troublesome symptoms and/or complications of persistent GER.



CLINICAL MANIFESTATIONS OF GERD IN CHILDREN

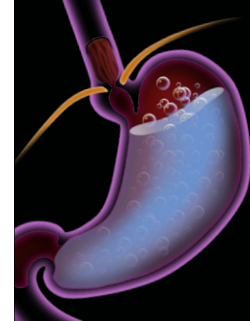
SYMPTOMS
• Recurrent regurgitation with/without vomiting
• Weight loss or poor weight gain
• Irritability in infants
• Ruminative behavior
• Heartburn or chest pain
• Hematemesis
• Dysphagia, odynophagia
• Wheezing
• Stridor
• Feeding refusal
• Cough
• Hoarseness

SIGNS
• Erosive esophagitis
• Esophageal stricture
• Barrett's esophagus
• Laryngeal/pharyngeal inflammation
• Recurrent pneumonia
• Anemia
• Dental erosions
• Wheezing
• Stridor
• Feeding refusal
• Dystonic neck posturing, back arching (Sandifer's syndrome)
• Apnea spells: rarely due to GERD
• Apparent life threatening events (ALTE): rarely due to GERD

WARNING SIGNALS IN INFANTS AND CHILDREN:

Suggesting DISORDERS OR CONDITIONS other than GERD

• Bilious vomiting
• Gastrointestinal (GI) bleeding <ul style="list-style-type: none">- Hematemesis- Hematochezia
• Persistently forceful vomiting
• New onset of vomiting after age 6 months
• Failure to thrive
• Diarrhea
• Constipation
• Fever
• Lethargy
• Hepatosplenomegaly
• Bulging fontanelle
• Macro/microcephaly
• Seizures
• Abdominal tenderness or distension
• Documented/suspected genetic/metabolic syndrome
• Abdominal tenderness or distension



DIAGNOSTIC APPROACHES

History and Physical Examination

- In infants and toddlers, no symptom or group of symptoms can reliably diagnose GERD or predict treatment response
- In older children and adolescents a history and physical examination are often sufficient to reliably diagnose GERD and initiate management

Esophageal pH Monitoring

- A valid and reliable measure of esophageal acid exposure only
- The severity of pathologic acid reflux does not correlate consistently with symptom severity or complications
- Useful for evaluating the efficacy of anti-secretory therapy
- May be useful to correlate symptoms (e.g. cough, chest pain) with acid reflux episodes, and to identify those patients with wheezing or respiratory symptoms in whom reflux is a causative or aggravating factor

Combined Multiple Intraluminal Impedance (MII) and pH Monitoring

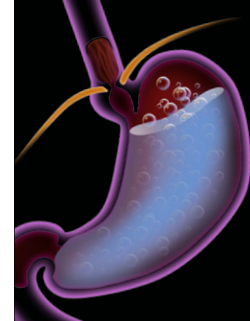
- MII measures the movement of fluids, solids and air to detect acid, weakly acid and non-acid reflux events
- MII and pH monitoring is superior to pH monitoring alone for evaluation of reflux-related symptom association

Endoscopy and Biopsy

- Reflux-induced esophageal damage is defined endoscopically as visible breaks (erosions) of the distal esophageal mucosa
- Esophageal biopsy cannot determine whether esophageal inflammation, if present, is due to reflux
- Absence of histological changes does not rule out reflux disease
- When endoscopy is performed, esophageal biopsies are recommended to diagnose Barrett's esophagus and causes of esophagitis other than reflux (e.g. eosinophilic esophagitis)

Barium Contrast Radiography (Upper GI Series)

- Not useful for the diagnosis of GERD
- Useful for the diagnosis of upper gastrointestinal tract anatomic abnormalities such as esophageal stricture, hiatal hernia, intestinal malrotation, achalasia, tracheoesophageal fistula, pyloric stenosis



Nuclear Scintigraphy

- May have a role in patients with chronic or refractory respiratory symptoms, to diagnose pulmonary aspiration of refluxed gastric contents
- Not routinely recommended in patients with other potentially reflux-related symptoms

Tests on Ear, Lung and Esophageal Fluids

- Pepsin in bronchoalveolar lavage fluid is an indicator of reflux-related aspiration, but its clinical utility remains to be established
- Lipid-laden-macrophages lack specificity and sensitivity for diagnosing reflux-related aspiration

Other Tests

- Esophageal manometry is not a diagnostic test for GERD but may identify motor disorders (e.g. achalasia) that may present with symptoms similar to those of GERD
- Esophageal and gastric ultrasonography are not recommended for the routine evaluation of GERD

Empiric Trial of Acid Suppression as a Diagnostic Test

- In the older child or adolescent with symptoms suggesting GERD, an empiric trial with a proton pump inhibitor (PPI) is justified for up to 4 weeks. Improvement following treatment does not confirm a diagnosis of GERD because symptoms may improve spontaneously or respond by a placebo effect
- There is no evidence to support an empiric trial of pharmacologic treatment in infants and young children as a diagnostic test of GERD

TREATMENT

Diet

- There is evidence to support a 2 to 4 week trial of an extensively hydrolyzed protein formula in formula-fed infants with symptoms suggestive of reflux disease
- Thickening of formula results in decreased visible reflux (regurgitation)
- In adults, obesity and late night eating are associated with symptoms of GERD

Positioning

- In infants (birth to 12 months of age), the risk of sudden infant death syndrome (SIDS) outweighs the potential benefits of prone sleeping. Therefore, supine positioning during sleep is generally recommended, although it may promote regurgitation.



- Prone positioning may be beneficial in children over 1 year of age with GER or GERD whose risk of SIDS is negligible
- In adolescents with GERD, left side sleeping positioning and elevation of the head of the bed may decrease symptoms of GERD

Acid-Suppressant Therapy

- Histamine₂-receptor antagonists (H₂RAs) produce relief of symptoms and mucosal healing
- PPIs are superior to H₂RAs in relieving symptoms and healing esophagitis
- When acid suppression is required, the smallest effective dose should be used
- Most patients require only once-daily PPI; routine use of twice-daily doses is not indicated
- No PPI is approved for use in infants younger than 1 year of age

Prokinetic and Other Therapy

- The potential benefits (i.e. reduction of reflux-related symptoms, in particular, regurgitation or vomiting) of currently available prokinetic agents are outweighed by their potential side effects
- There is insufficient evidence to support the routine use of metoclopramide, erythromycin, bethanechol or domperidone for GERD
- Since more effective alternatives (H₂RAs and PPIs) are available, chronic therapy with buffering agents, alginates and sucralfate is not recommended for GERD

Surgery

- Should be considered only in children with an established diagnosis of GERD and failure of optimized medical therapy; or long-term dependence on medical therapy where compliance or patient preference preclude ongoing use; or life-threatening complications of GERD

EVALUATION AND MANAGEMENT OF INFANTS AND CHILDREN WITH SUSPECTED GERD

1. The Infant with Uncomplicated Recurrent Regurgitation (“Happy Spitter”)

• Diagnosis

- A history and physical examination with absence of alarm signs or symptoms is generally sufficient to establish a clinical diagnosis of GER, i.e. physiologic reflux
- Upper GI series or other diagnostic tests are not required unless diagnoses other than GERD are suspected, e.g. gastrointestinal obstruction



- **Management**

- Parental education, reassurance and anticipatory guidance
- Thickened formula (or anti-regurgitation formula)
- If symptoms worsen or do not resolve by 12 to 18 months of age or alarm signs or symptoms develop, referral to a pediatric gastroenterologist is recommended

2. The Infant with Recurrent Regurgitation and Poor Weight Gain

- **Diagnosis**

- If caloric intake is adequate, initial evaluation should include:
 - Diet history
 - Urinalysis
 - Complete blood count
 - Serum electrolytes
 - Blood urea nitrogen
 - Serum creatinine
 - Celiac screening
 - Upper GI series

- **Management**

- A 2-week trial of extensively hydrolyzed/amino acid formula, thickened formula, or increased caloric density
- If dietary management fails and/or if the investigations reveal no abnormalities, referral to a pediatric gastroenterologist is recommended

3. The Infant with Unexplained Crying and/or Distressed Behavior

- Reflux is an uncommon cause of irritability or unexplained crying in otherwise healthy infants
- There is no evidence to support the empiric use of acid suppression in such infants

4. The Child Over 18 Months with Chronic Regurgitation or Vomiting

- **Diagnosis**

- While physiologic regurgitation and episodic vomiting are frequent in infants they are less common in children greater than 18 months of age
- Although these symptoms are not unique to GERD, evaluation to diagnose possible GERD and to rule out alternative diagnoses is recommended
- Testing may include upper gastrointestinal endoscopy, and/or esophageal pH/MII and/or barium upper GI series



5. Heartburn in Older Children or Adolescents

• Management

- Lifestyle changes with a 4-week PPI trial are recommended
- If symptoms resolve, continue PPI for 3 months
- Heartburn that persists on PPI therapy or recurs after treatment should be investigated by a pediatric gastroenterologist

6. Reflux Esophagitis

• Management

- Initial treatment consists of lifestyle changes and PPI therapy for 3 months
- In most cases, efficacy of therapy can be monitored by the degree of symptom relief
- Not all reflux esophagitis is chronic or relapsing, therefore trials of tapering the dose and then withdrawal of PPI therapy should be performed at intervals

7. Barrett's Esophagus (BE)

• Diagnosis

- Acquisition of multiple biopsies documented in relation to endoscopically-identified esophagogastric landmarks is required to confirm or rule out the diagnosis of BE and dysplasia
- Intestinal metaplasia is not a sine qua non for the diagnosis of BE. The new terminology is; BE with or without intestinal metaplasia

• Management

- Aggressive acid suppression is advised for most cases
- Dysplasia is managed according to adult guidelines

8. Food Refusal, Dysphagia and Odynophagia

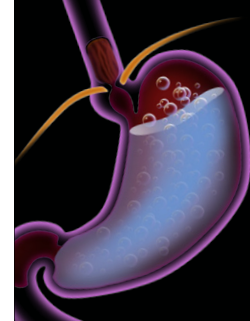
• Diagnosis and Management

- In the infant with feeding refusal, acid suppression without prior diagnostic evaluation is not recommended
- In the child with dysphagia or odynophagia, a barium esophagram is recommended, generally followed by an upper endoscopy
- Acid suppression without prior diagnostic evaluation is not recommended

9. The infant with apnea or apparent life threatening event (ALTE)

• Diagnosis

- In the great majority of cases of pathologic apnea or ALTE, reflux is not the cause, although a clear temporal relationship exists in the occasional case
- If this relationship is suspected or if symptoms recur, impedance pH recording in combination with polysomnographic recording may aid in establishing cause and effect



10. Asthma

• Management

- Patients with asthma and heartburn should be treated for the heartburn
- Despite a high frequency of reflux events in asthmatic patients, only a select group with nocturnal asthma symptoms, or with steroid- dependent, difficult to control asthma will benefit from long-term medical anti-reflux therapy or surgery

11. Recurrent Pneumonia

- Recurrent pneumonia and interstitial lung disease may be complications of reflux, due to aspiration of gastric contents
- No test can determine whether reflux is causing recurrent pneumonia
- Diagnostic evaluation may include:
 - A trial of nasogastric feeding to exclude aspiration during swallowing
 - A trial of nasojejunal therapy to determine if surgical antireflux therapy may be beneficial

12. Upper Airway Symptoms

- Chronic hoarseness, chronic cough, sinusitis, chronic otitis media, erythema and cobblestone appearance of the larynx have not been proved to be associated as there is insufficient evidence demonstrating causality from persistent reflux

13. Dental Erosions

- An association between GERD and dental erosions is well established; young children and children with neurologic impairment appear to be at greatest risk

14. Sandifer's Syndrome

- A spasmodic torsional dystonia with arching of the back and opisthotonic posturing, mainly involving the neck
- An uncommon but specific manifestation of GERD that resolves with antireflux treatment

GROUPS AT HIGH RISK FOR GERD

Certain conditions predispose to severe, chronic GERD. These conditions include neurologic impairment, obesity, repaired esophageal atresia or other congenital esophageal disease, cystic fibrosis, hiatal hernia, repaired achalasia, lung transplantation, and a family history of GERD, BE, or esophageal adenocarcinoma.

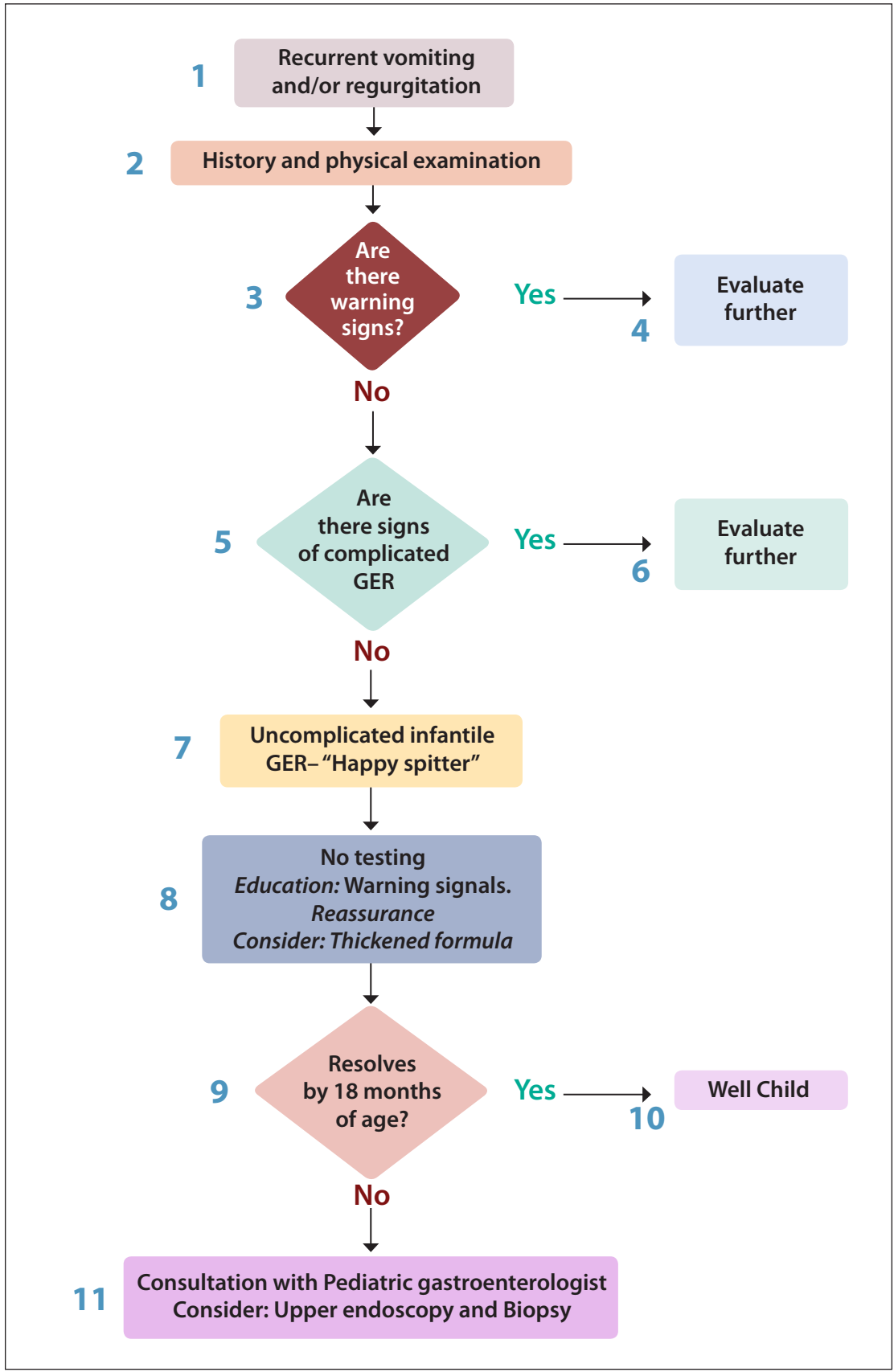


FIGURE 1: Approach to the Infant with Uncomplicated Recurrent Regurgitation (Happy Spitter)

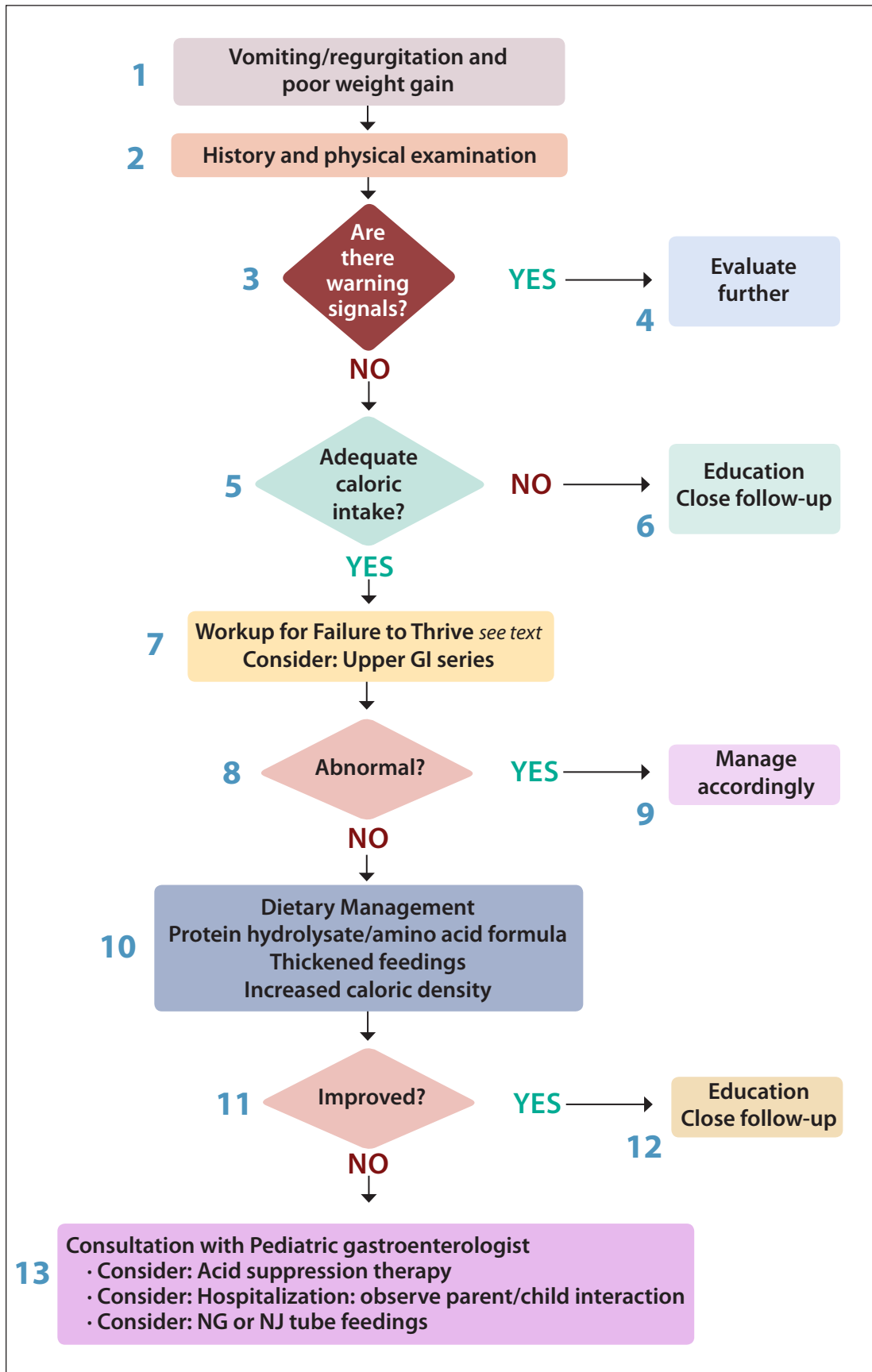
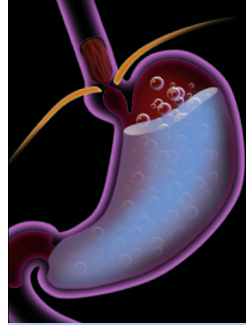


FIGURE 2: Approach to the Infant with Recurrent Regurgitation and Poor Weight Gain

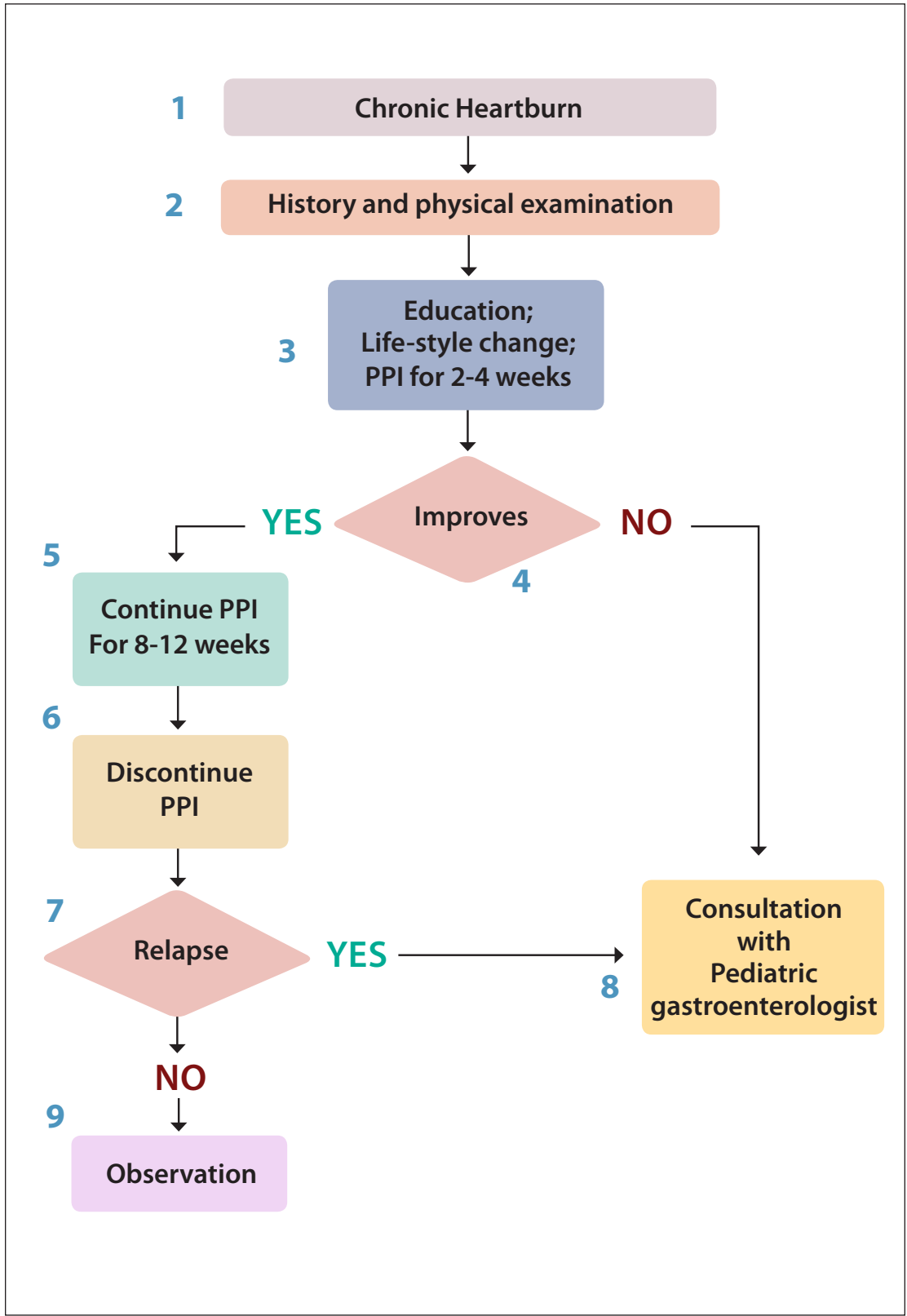


FIGURE 3: Approach to the Older Child or Adolescent with Heartburn

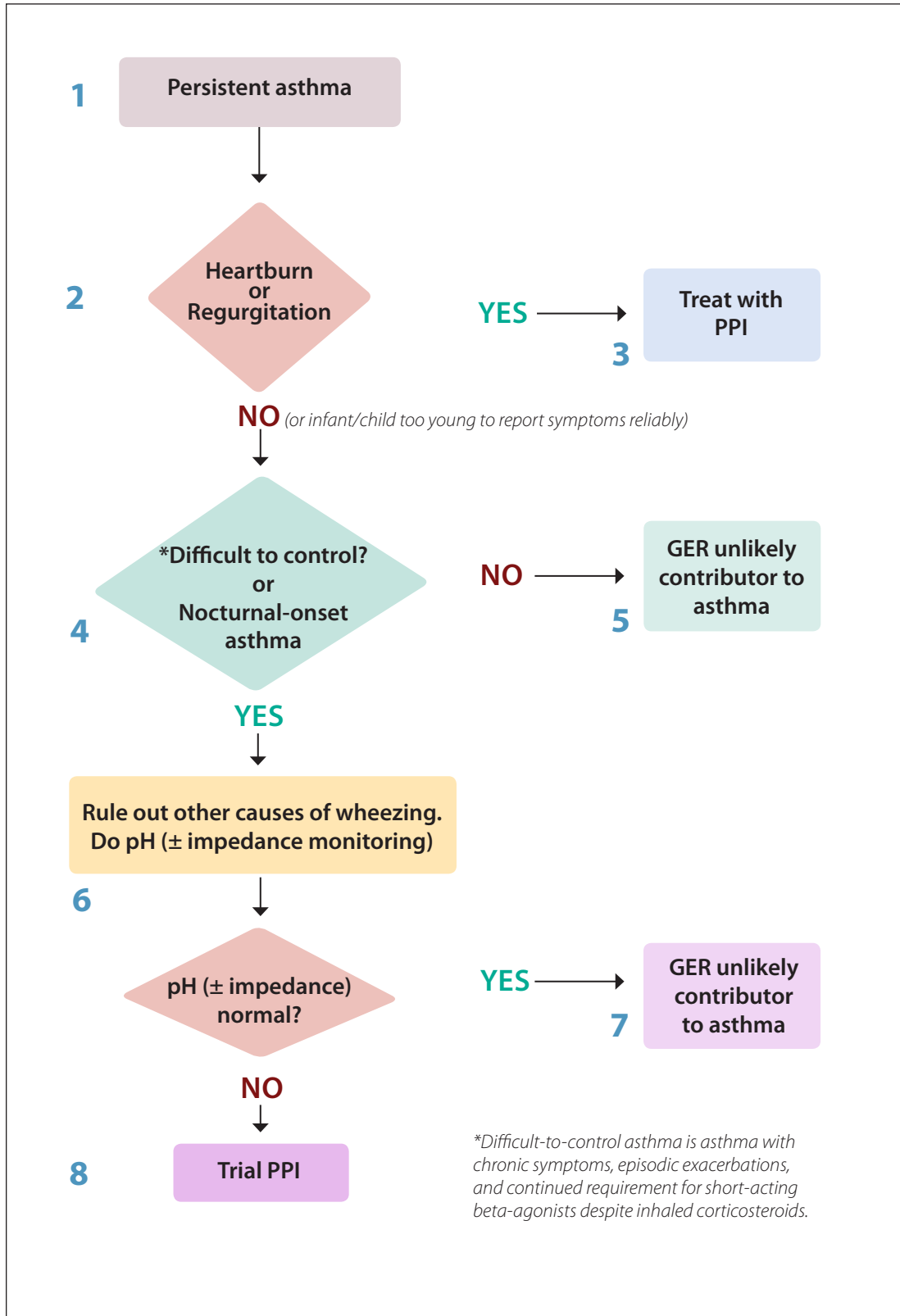


FIGURE 4: Approach to the child with asthma that may be worsened by GERD

**REFERENCES:**

1. Vandeplass Y, Rudolph CD, Di Lorenzo C, Hassall E, Liptak G, Mazur L, Sondheimer J, Staiano A, Thomson M, Veereman-Wauters G, Wenzl TG. Pediatric Gastroesophageal Reflux Clinical Practice Guidelines: Joint Recommendations of the North American Society of Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society of Pediatric Gastroenterology, Hepatology, and Nutrition. *J Pediatr Gastroenterol Nutr* 2009;49:498-547.

Complete guidelines can also be found on the following websites: www.cdhnf.org or www.naspgghan.org.

2. Sherman P, Hassall E, Fagundes-Neto U, Gold BD, Kato S, Koletzko S, Orenstein S, Rudolph C, Vakil N, Vandeplass Y. A Global, Evidence-Based Consensus on the Definition of Gastroesophageal Reflux Disease in the Pediatric Population. *Am J Gastroenterol*. 2009;104:1278-1295.

The North American Society of Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) represents more than 1400 pediatric gastroenterologists, predominantly in 46 states, the District of Columbia, Puerto Rico, Mexico and 8 provinces in Canada. NASPGHAN strives to improve the care of infants, children and adolescents with digestive disorders by promoting advances in clinical care, research and education.

The Children's Digestive Health and Nutrition Foundation (CDHNF) was established by NASPGHAN to promote research and education that will improve the health of children with digestive and nutritional disorders.

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