

A 2-month-old full-term girl is brought to the office for a well-baby visit. She drinks 5 oz of a standard cow's milk-based formula every 4 hours. Her parents are concerned as she regurgitates a small amount of formula after each feed. The patient is "fussy" when the formula spills out of her nose but then calms down after burping. She has no coughing, gagging, or breathing difficulties. Her weight, height, and head circumference have been tracking along the 25th percentile since birth. Physical examination reveals intermittent smiling and cooing. The patient is able to lift her head briefly to 30 degrees while prone. Her lungs are clear to auscultation. The abdomen is soft, nontender, and nondistended. Which of the following is the best next step in management of this infant?

- ☐ A. Initiate proton-pump inhibitor therapy
- ☐ B. Obtain abdominal ultrasound
- ☐ C. Provide reassurance
- ☐ D. Recommend sleeping in the prone position
- ☐ E. Switch to a hydrolyzed formula
- ☐ F. Switch to goat milk
- ☐ G. Thicken formula with oatmeal

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- ☐ A. Initiate proton-pump inhibitor therapy [4%]
- ☐ B. Obtain abdominal ultrasound [2%]
- ☒ C. **Provide reassurance** [78%]
- ☐ D. Recommend sleeping in the prone position [1%]
- ☐ E. Switch to a hydrolyzed formula [10%]
- ☐ F. Switch to goat milk [0%]
- ☐ G. Thicken formula with oatmeal [5%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Differential diagnosis of regurgitation & vomiting in infants		
Diagnosis	Clinical features	Management
Gastroesophageal reflux	<ul style="list-style-type: none"> • Physiologic <ul style="list-style-type: none"> ○ Asymptomatic ○ "Happy spitter" 	<ul style="list-style-type: none"> • Reassurance • Positioning therapy
	<ul style="list-style-type: none"> • Pathologic (GERD) <ul style="list-style-type: none"> ○ Failure to thrive ○ Significant irritability ○ Sandifer syndrome 	<ul style="list-style-type: none"> • Thickened feeds • Antacid therapy • If severe, esophageal pH probe monitoring & upper endoscopy

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Milk protein allergy	<ul style="list-style-type: none"> • Regurgitation/vomiting • Eczema • Bloody stools 	<ul style="list-style-type: none"> • Elimination of dairy & soy protein from diet
Pyloric stenosis	<ul style="list-style-type: none"> • Projectile nonbilious vomiting • Olive-shaped abdominal mass • Dehydration, weight loss 	<ul style="list-style-type: none"> • Abdominal ultrasound • Pyloromyotomy

GERD = gastroesophageal reflux disease.

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Gastroesophageal reflux is extremely common and affects more than 50% of infants. Normally, healthy people of all ages have small amounts of gastric contents reflux into the esophagus. Compared to adults, infants experience frequent **postprandial regurgitation** (eg, "spitting up," "spilling") due to physiologic differences. These differences include a shorter esophagus, incomplete closure of the lower esophageal sphincter, and greater time spent in the supine position. Most infants are otherwise **asymptomatic** (eg, "happy spitter"), and parents should be reassured if examination, growth, and development are normal.

Diagnosis is based on history and physical examination. Treatment consists of education and supportive measures. Parents should be advised to give **frequent, small-volume feeds**; **hold the infant upright** for 20-30 minutes after feeds; and place the infant prone

Pyloric stenosis

- Olive-shaped abdominal mass
- Dehydration, weight loss
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Diagnosis is based on history and physical examination. Treatment consists of education and supportive measures. Parents should be advised to give **frequent, small-volume feeds**; **hold the infant upright** for 20-30 minutes after feeds; and place the infant prone when awake. Activities that increase intraabdominal pressure (eg, fastening the diaper too tight, bringing the knees to the stomach) should be avoided. Regurgitation usually improves around age 6 months (when the infant can sit unsupported) and resolves by age 1 year.

(Choices A and G) In contrast to physiologic reflux, pathologic features of gastroesophageal reflux disease (GERD) include failure to thrive (eg, poor weight gain, drop in growth percentiles) or Sandifer syndrome (intermittent opisthotonic posturing). Thickened feeds (eg, adding oatmeal) and antacid therapy (eg, proton pump inhibitor [PPI]) are the first steps in management of GERD. These interventions are unnecessary for physiologic reflux as thickened feeds can cause excessive weight gain and PPIs increase risk for pneumonia and diarrhea.

(Choice B) Pyloric stenosis presents with frequent projectile vomiting and is diagnosed by abdominal ultrasound. This patient appears well and is gaining weight, making further workup unnecessary.

(Choice D) Prone positioning can decrease reflux. However, an infant should be placed only on the back (ie, supine) during sleep as the risk of sudden infant death syndrome with prone sleeping outweighs the benefit of reflux reduction.

(Choice E) Regurgitation caused by milk protein allergy is associated with eczema, poor weight gain, and bloody stools and is treated by switching to a hydrolyzed formula.

(Choice F) Standard infant formula is cow milk protein-based and provides infants with necessary nutrients. Goat milk is deficient in folate and would result in a macrocytic anemia.

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Educational objective:

Gastroesophageal reflux is common in infants due to a shorter esophagus, incomplete closure of the lower esophageal sphincter, and greater time spent in the supine position. Parents should be reassured by the infant's adequate weight gain and be advised to hold the infant upright after feeds.

References:

1. [Pediatric gastroesophageal reflux clinical practice guidelines: Joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition \(NASPGHAN\) and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition \(ESPGHAN\).](#)
2. [Prevalence and natural history of gastroesophageal reflux: Pediatric prospective survey.](#)
3. [SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment.](#)

Media Exhibit

Gastroesophageal reflux in infants

Gastroesophageal reflux in infants

