

# Gastroesophageal Reflux and Gastroesophageal Reflux Disease in the Neurologically Impaired Child

## Scope of the Problem

Gastroesophageal reflux (GER) and gastroesophageal reflux disease (GERD) are especially common in neurologically impaired children and may be resistant to standard medical therapy. Foregut dysmotility and oropharyngeal discoordination may complicate the diagnosis and treatment of reflux in this population.

## Signs and Symptoms of GE Reflux in the Neurologically Impaired Child

The most common manifestations of suspected reflux disease and its complications in these patients include:

- Vomiting
- Coughing between meals
- Recurrent aspiration pneumonia
- Malnutrition
- Irritability
- Swallowing discoordination
- Feeding refusal
- Arching

## Diagnosis

GER and GERD are clinical diagnoses, but several studies are useful in excluding other causes of similar symptoms and in identifying concurrent problems.

**Observation** during a feeding session is an essential first step in evaluating the neurologically impaired child. When assessing oropharyngeal discoordination, pay particular attention to the appropriateness of labial closure, the dynamics and effectiveness of the suck, and the presence of gurgling, choking, coughing, or sputtering. A formal evaluation of the swallowing process by an occupational or speech therapist with a specialty in feeding and swallowing is frequently necessary. A **modified barium swallow** (also known as a video swallow or rehabilitation swallow study), in conjunction with video fluoroscopy, allows real-time evaluation of the swallowing mechanics.

The **upper gastrointestinal x-ray series** is very helpful in identifying anatomic problems,

including causes of symptoms and signs suggestive of reflux, such as stenosis, webs, annular pancreas and malrotation, which can mimic GERD.

The **upper gastrointestinal endoscopy** is useful in determining whether esophageal injury is present. It can also differentiate GERD from other upper GI conditions including *eosinophilic esophagitis*, *candida esophagitis*, *H.pylori*, and *peptic ulcer disease*.

The **nuclear medicine scan** uses Tc99-labelled formula to provide information on gastric emptying time. Gastroparesis is commonly associated with GER in neurologically impaired children.

The **pH probe study** documents the extent and timing of esophageal acid exposure. It is not usually required for diagnosis, but it can be useful in correlating symptoms such as nighttime coughing or irritability with esophageal acid exposure and in titrating acid suppressive therapy.



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## Treatment Options

**Medical management** of reflux in this population focuses on the prevention and treatment of peptic irritation to the esophagus.

Acid control is important in preventing acute and chronic damage to the esophageal lining. Ulceration can present with anemia, or with frank blood or coffee-ground-tinged material in the emesis. Inhibition of acid production is accomplished with either histamine-2 receptor antagonists (H2RAs) (cimetidine, ranitidine, famotidine, and nizatidine) or with the more powerful proton pump inhibitors (PPIs) (omeprazole, rabaprazole, lansoprazole, esomeprazole, and pantoprazole). The H2RAs are all available as liquids, but the PPIs are not. Omeprazole and lansoprazole are available as powders and lansoprazole is also available as a dissolvable tablet; these medications can be compounded by a pharmacist into liquids. Many years of experience with these agents indicate that they are safe for use in infants and children and effective in healing esophagitis and decreasing vocal cord and airway irritation in children over one year of age. The combination of an H2RA and a PPI is not recommended.

Addressing underlying disordered motility is not possible with available medications. No prokinetic has been shown to be effective in children with GERD in double-blind, placebo controlled studies. Because metoclopramide has a high rate of adverse side effects, its use is not routinely recommended.

Providing adequate nutritional management for a neurologically handicapped infant or child often proves challenging. It is important to remember that nutritional management needs to be individualized since some children have decreased caloric requirements because of immobility but others have increased requirements because of spasticity.

**Tube feedings** may be required for children at high risk for aspiration. They are also useful as an adjunct for children who can eat safely by mouth but who require excessive amounts of time for oral feeding. Though most parents are initially resistant to the idea of placing a **gastrostomy tube** (GT), they often report that they feel freer to enjoy their children when the pressure to provide adequate calories by mouth has been removed. Transgastric **jejunal tubes** (JTs), which bypass the pylorus, are often effective in managing clinically significant



GERD. They do, however, require continuous feeding. A venting gastrostomy is often placed with a JT.

Mechanical problems with gastrostomy or jejunostomy appliances can result in dislodgement, leakage of gastric or biliary material, local irritation and infection, and formation of granulation tissue at the ostomy site. Tubes must be flushed regularly to avoid clogging. Pediatric nurses skilled in ostomy care and familiar with the wide array of equipment now available can work with families to prevent and address these problems.

**Surgical management** may be undertaken to block reflux or to improve gastric emptying. An **anti-reflux operation** is often considered when vomiting is prominent, particularly in the setting of a decreased gag reflex and ineffective upper airway protection. It is important to remember that vomiting in these children is the end result of complex neurosensory and muscular interactions. A **fundoplication wrap** can cause postoperative difficulties including retching, an inability to burp, gas bloat, and further impairment of esophageal clearance. Early breakdown of the fundoplication and significant adverse effects have been reported in 10-50% of patients.

**Pyloroplasty** has also been used to overcome some of the difficulties associated with delayed gastric emptying. Results of studies comparing fundoplication plus pyloroplasty with simple fundoplication have been mixed. A pyloroplasty can also promote the **dumping syndrome**, an unpleasant and sometimes dangerous derangement caused by osmotic fluid changes secondary to rapid influx of carbohydrate into the upper small bowel.

## Prognosis

Neurologic impairment predisposes children to GERD and related problems, including gastroparesis, aspiration, and malnutrition. The severity of these problems and the child's prognosis are related to the type and extent of the underlying neurological condition.

The peptic complications of reflux disease can be managed effectively with available medications but many neurologically impaired children have life-long gastrointestinal difficulties that require constant attention, multiple interventions and ongoing adjustments by both parents and healthcare practitioners.

The challenge of providing adequate nutrition while minimizing the risk of aspiration and offering enhanced quality of life is best approached as a team effort. A

**multi-disciplinary group**, including pediatricians, pediatric gastroenterologists, pediatric nurses, surgeons, pulmonologists, feeding therapists and nutritionists can best meet the complex needs of these children and their families.

*The material in this document is based on the NASPGHAN Pediatric Gastroesophageal Reflux Clinical Practice Guidelines that were published in the Journal of Pediatric Gastroenterology and Nutrition © 2001; Volume 32: Supplement 2 pages 1-31. Complete guidelines can also be found on the following websites: [www.cdhnf.org](http://www.cdhnf.org) or [www.naspghan.org](http://www.naspghan.org)*

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