Gastroesophageal Reflux (GER)
Prescribing for Gastroesophageal Reflux

Prescribing medications to treat Gastroesophageal Reflux (GER) or symptoms of heartburn has become increasingly common and there is an array of options available. To address the chronic use and varying costs of these medications, Partners For Kids, in collaboration with Nationwide Children’s Division of Pediatric Gastroenterology, have created this tool.

Start by maximize feeding changes in infants and dietary/lifestyle modifications in children/adolescents, then apply the following recommendations when deciding to trial acid suppression medications:

1. Medications should only be used for treatment of typical symptoms in children with GERD.
   a. Medications are not recommended for:
      - Crying/distress in infants without presence of other signs/symptoms
      - Visible regurgitation without presence of other signs/symptoms
      - Extra-esophageal symptoms only
   b. Generally, antacids/alginate are not recommended for chronic treatment for GERD in infants and children.
   c. Decision between Histamine-2 Receptor Antagonist (H2RA) therapy and Proton Pump Inhibitor (PPI) therapy should be based upon:
      - Ease and ability to administer medication (see Table 1 for available dosage formulations)
      - Cost/insurance coverage
      - Availability as not all pharmacies compound PPI products
   d. In general, evidence in adults supports superiority of PPI over H2RA therapy; however, there is a lack of research in children.

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**ALGORITHM 1.** Management of the symptomatic infant.¹

- **Infant with suspicion of GERD**
  - History and physical exam
  - Presence of alarm sign
    - NO
      - Avoid overfeeding
      - Thicken feeds
      - Continue breastfeeding
    - NO
    - Consider 2–4 weeks of protein hydrolysate or amino acid based formula or, in breastfed infants, elimination of cow’s milk in maternal diet
    - NO
    - Referral to pediatric GI
    - NO
    - Tailor testing to address alarm signs and refer appropriately
    - IMPROVED
      - Continue management
    - IMPROVED
      - Continue management and discuss milk protein reintroduction at follow up
    - REFERRAL NOT POSSIBLE
      - Consider 4–8 week trial of acid suppression then wean if symptoms improved
    - REVISIT THE DIFFERENTIAL DIAGNOSES, CONSIDER TESTING AND/OR SHORT MEDICATION TRIAL
  - YES
    - Tailor testing to address alarm signs and refer appropriately

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**ALGORITHM 2.** Management of reflux symptoms in the older child.²

- **Child with typical symptoms of GERD**
  - History and physical exam
  - Presence of alarm sign
    - NO
    - Tailor testing to address alarm signs and refer appropriately
    - IMPROVED
      - Acid suppression for 4–8 weeks
      - CONTINUE MANAGEMENT
      - SYMPTOMS IMPROVED
        - Refer to pediatric GI
    - IMPROVED
      - SYMPTOMS NOT IMPROVED OR RECUR
        - Acid suppression for 4–8 weeks and then attempt wean
        - CONTINUE MANAGEMENT
    - REFERRAL
      - SYMPTOMS RECUR OR WEANING
        - Referral to pediatric GI

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2. Things to consider when prescribing PPI therapy:
   a. If a patient can take solid dosage forms, consider omeprazole (Prilosec®) first line over lansoprazole (Prevacid®). These capsules can be opened and sprinkled on soft foods.
   b. If a liquid/dissolvable formulation is required, try compounded omeprazole suspension before lansoprazole orally-disintegrating tablets (Prevacid® SoluTab®).
   c. Chronic acid suppression can minimize the effectiveness of any medication that requires acid for absorption. These medications include: antifungals (ketoconazole, voriconazole, itraconazole), atazanavir, calcium, and iron salts.
   d. In 2012, the FDA issued a Safety Alert that PPIs may be associated with an increased risk of Clostridium-associated diarrhea (CDAD). The FDA recommends using the lowest dose and shortest duration of PPI therapy possible and advising patients to seek medical attention if they develop symptoms of CDAD (abdominal pain, fever, and watery stools).²
   e. Adult studies have shown that use of PPIs increases risk of fractures, dementia, MI, and renal disease.
   f. Not enough research is available on long term effects of these medications in pediatric patients taking acid suppression medications. However, some reports have shown increased risk of infections (necrotizing enterocolitis, community-acquired pneumonia, upper respiratory tract infections, sepsis, and urinary tract infections) in this patient population.³

### TABLE 1. Available Dosage Formulations

#### Histamine-2 Receptor Antagonist (H2RA)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Formulation</th>
<th>Strength</th>
<th>Dosing</th>
<th>Max Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Famotidine</td>
<td>Suspension</td>
<td>40 mg/5 mL</td>
<td>1 mg/kg/day divided twice daily</td>
<td>40 mg/day</td>
</tr>
<tr>
<td>(Pepcid®)</td>
<td>tablet</td>
<td>10 mg, 20 mg, 40 mg</td>
<td>40 mg/day</td>
<td></td>
</tr>
</tbody>
</table>

#### Proton Pump Inhibitors (PPI)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Formulation</th>
<th>Strength</th>
<th>Dosing</th>
<th>Max Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omeprazole</td>
<td>Suspension</td>
<td>2 mg/mL</td>
<td>1 - 4 mg/kg/day given once daily</td>
<td>40 mg/day</td>
</tr>
<tr>
<td>(Prilosec®)</td>
<td>Capsule</td>
<td>10 mg, 20 mg, 40 mg</td>
<td>40 mg/day</td>
<td></td>
</tr>
<tr>
<td>Lansoprazole</td>
<td>Suspension</td>
<td>3 mg/mL</td>
<td>1–2 mg/kg/day given once daily</td>
<td>30 mg/day</td>
</tr>
<tr>
<td>(Prevacid®)</td>
<td>Capsule</td>
<td>15 mg, 30 mg</td>
<td>30 mg/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orally-disintegrating tablet</td>
<td>15 mg, 30 mg</td>
<td>30 mg/day</td>
<td></td>
</tr>
<tr>
<td>Pantoprazole</td>
<td>Packet for oral suspension</td>
<td>40 mg</td>
<td>&lt; 5 years: 0.6 – 1.2 mg/kg/day</td>
<td>40 mg/day</td>
</tr>
<tr>
<td>(Protonix®)</td>
<td>Tablet</td>
<td>20 mg, 40 mg</td>
<td>&gt; 5 years OR &lt; 40 kg: 20 mg daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt; 12 years OR &gt; 40 kg: 40 mg daily</td>
<td></td>
</tr>
</tbody>
</table>
Referrals and Consultations

Online: NationwideChildrens.org
Phone: (614) 722-6600 or (877) 722-6220  Fax: (614) 722-4000
Physician Direct Connect Line for 24-hour urgent physician consultations:
(614) 355-0221 or (877) 355-0221.
Pharmacy Consultations/Assistance: PFKPharmacy@NationwideChildrens.org