Review of Current Management and Treatment Guidelines for *H. Pylori* in Children

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**H. pylori**

- Helicobacter pylori (*H. pylori*): gram negative spiral bacterium with infection
- Majority of children infected with *H. pylori* are asymptomatic
- Infection in early childhood may have possible benefits later in life
- Management and Eradication of *H. pylori* has become increasingly challenging due to clarithromycin resistance, poor adherence to medical therapy, and low gastric pH
2016 NASPGHAN Updated Guidelines for H. Pylori

- Updated due to the changing epidemiology of H. pylori infection and decreasing efficacy of treatment
- Emphasize the importance of invasive diagnostic testing with endoscopy and performance of H. pylori culture to help guide medical therapy
- Former test and treat strategy was discouraged and the regimen for empiric treatment was changed to high-dose amoxicillin, metronidazole and proton pump inhibitor (PPI).
If you were considering a diagnosis of *H. pylori*, what testing would you perform?

A) Blood serology
B) Urine serology
C) Stool antigen testing for *H. pylori*
D) Urea breath test
E) None of the above
Diagnostic Testing: Guidelines recommend endoscopy biopsy based testing to evaluate for underlying cause of symptoms. Stool antigen and breath test are not recommended to diagnose *H. pylori* since presence of *H. pylori* may be incidental and not related to symptoms. Culture of biopsy can also help guide therapy.
If you diagnose and treat *H. pylori*, which of the following antibiotics do you typically use for first line treatment? (Choose 2)

- Amoxicillin
- Metronidazole
- Clarithromycin
- Levofloxacin
- Tetracycline
- Ceftriaxone
- Cefdinir
First line treatment should include a PPI as well as the following two antibiotics: *Amoxicillin and Metronidazole*. Clarithromycin should only be used if the strain is known to be susceptible.
When *H. pylori* sensitivities are not known, what is recommended dose of amoxicillin in the treatment of *H. pylori* in a 20 kg child?

- 250 mg twice a day
- 500 mg twice a day
- 750 mg twice a day
- 1500 mg twice a day
Patient is 20 kg which is between 15-24kg, which would have **amoxicillin 750mg BID**. High dose amoxicillin is needed since sensitivities are unknown
Susceptibility-based treatment for *H. pylori*

**H. pylori infection**

- No resistance to clarithromycin or metronidazole
  - PPI + amoxicillin + clarithromycin
  - OR
    - PPI + amoxicillin for 5 d followed by PPI + clarithromycin + metronidazole for 5 d

- Failure of first course OR clarithromycin resistance
  - PPI + amoxicillin + metronidazole

- Unknown susceptibilities OR documented resistance to clarithromycin and metronidazole
  - PPI + high-dose amoxicillin + metronidazole +/- bismuth

Desiree Sierra et al. Pediatrics in Review 2018;39:542-549
Weight-based doses for *H. pylori* treatment if sensitivities are known

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose Scheme</th>
</tr>
</thead>
</table>
| **PPI**         | - 15 – 24 kg give 20 mg BID  
                  | - 25 – 34 kg give 30 mg BID  
                  | - ≥35 kg give 40 mg BID        |
| **Amoxicillin** | - 15 – 24 kg give 500 mg BID  
                  | - 25 – 34 kg give 750 mg BID  
                  | - ≥35 kg give 1,000 mg BID     |
| **Clarithromycin** | - 15 – 24 kg give 250 mg BID  
                      | - 25 – 34 kg give 500 mg in am and 250 mg in pm  
                      | - ≥ 35 kg give 500 mg BID     |
| **Metronidazole** | - 15 – 24 kg give 250 mg BID  
                      | - 25 – 34 kg give 500 mg in am and 250 mg in pm  
                      | - ≥35 kg give 500 mg BID     |

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Weight-based doses for *H. pylori* treatment if sensitivities are not known

**TABLE 4. High dosing regimen for amoxicillin**

<table>
<thead>
<tr>
<th>Bodyweight range, kg</th>
<th>Morning dose, mg</th>
<th>Evening dose, mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>15–24</td>
<td>750</td>
<td>750</td>
</tr>
<tr>
<td>25–34</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>&gt;35</td>
<td>1500</td>
<td>1500</td>
</tr>
</tbody>
</table>
How would you assess cure of *H. pylori*?

- Based on resolution of symptoms
- Repeat stool antigen testing
- Repeat blood serology
- Repeat urine serology
- Repeat urease breath testing
Test of Cure: Urease breath test OR Stool antigen testing should be performed at least 4 weeks after completion of treatment
# Summary of New Guideline Recommendations

## Diagnosis

| Positive H. pylori culture on endoscopy biopsy |

## First Line Treatment

<table>
<thead>
<tr>
<th>Antimicrobial Sensitivity</th>
<th>Suggested Regimen</th>
<th>Amoxicillin Dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susceptible Unknown</td>
<td>PPI-AMO-MET 14 days</td>
<td>High-dose or bismuth-based</td>
</tr>
</tbody>
</table>

## Test of Cure

To be completed 4 weeks after completion of therapy

- $^{13}$C-urea breath test
- 2-step monoclonal stool antigen test
PPI Use in *H. Pylori* Treatment

- Younger children need a higher PPI dose per kg bodyweight compared to adolescents and adults to obtain sufficient acid suppression.
- PPI should be given 15 minutes before meal.
- Esomeprazole and Rabeprazole are less susceptible to degradation by rapid metabolizers with CYP2C19 genetic polymorphism and may be preferred when available.