### H. pylori Eradication

#### (PPI + amoxicillin + clarithromycin)

<table>
<thead>
<tr>
<th>Selected Regimens</th>
<th>Days</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lansoprazole 30mg po BID</td>
<td>X7d</td>
<td>$100</td>
</tr>
<tr>
<td>Amoxicillin 1000mg po BID</td>
<td>X7d</td>
<td>$65 generic</td>
</tr>
<tr>
<td>Clarithromycin 500mg po BID</td>
<td>X7d</td>
<td>$68 generic</td>
</tr>
</tbody>
</table>

**Comments**: (PPIs are best given ~30min before meals)

- **Hp-PAC**: all 3 meds in a single 7day blister pack
- lower dose of clarithromycin (250mg) was effective in some studies but is not currently recommended
- using 2x 500mg XL od with food is ~$13 more than the reg formulation
- SE: diarrhea (~28%), taste disturbance (~15%)
- CI: avoid if penicillin allergy

**esomепразол NEXIUM**: 20mg po BID

- effective as omeprazole 20mg BID and an option to listed PPIs
- 7day rabeprazole/amoxicillin/clarithromycin = SE generic

**Rabeprazole PARET**

- on SPDP, 20mg BID -approved; similar efficacy:
- 7day rabeprazole/amoxicillin/clarithromycin = SE generic

**Drug-Lab Interaction**: PPIs & H2RA should be stopped 2 weeks & antibiotics 4 weeks prior to culture & histology for H. pylori. For the 13C-urea breath test, stop for: antibiotics 4 week, bismuth 2 weeks, PPI 3 days & H2RAs 1 day to prevent false negative results. Concurrent antacids will affect the urea breath test.

### Alternate First-Line

**Quadruple Tx Regimens** (PPI + bismuth + 2 antibiotics) eg. OMBT

<table>
<thead>
<tr>
<th>Selected Regimens</th>
<th>Days</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omeprazole 20mg po BID</td>
<td>X7d</td>
<td>$55</td>
</tr>
<tr>
<td>Rabeprazole 20mg po BID</td>
<td>X7d</td>
<td>$75</td>
</tr>
<tr>
<td>Bismuth subsalicylate</td>
<td>X14d</td>
<td>$85 generic</td>
</tr>
<tr>
<td>Tetracycline 250mg po QID ac</td>
<td>X14d</td>
<td>$85 generic</td>
</tr>
</tbody>
</table>

**Comments**

- 14 day quadruple tx most effective but less well tolerated & more $$
- 10-14 day option for 1st line tx or treatment failure.
- PEPTO BISMOL suspension preferred to tablets to avoid drug interaction with tetracycline (PEPTO BISMOL tablets contain calcium carbonate which can interfere with tetracycline).
- SE: temporary darkening of stool and tongue, diarrhea
- CI: porphyrina, renal dysfx
- Pregnancy: children; avoid alcohol

**Resistance**: Cdn 2004: metronidazole = 20%, clarithromycin 1-2% to 8% absolute & amoxicillin 7% (may affect ERS) & antibiotics

**Follow-up acid suppression** (with PPI or H2RA) not generally indicated exp. duodenal ulcers. Once H. pylori eradicated except for acute ulcer healing exp. gastric ulcers, if symptomatic or if complicated/high risk pts.

**Other regimens**: Quadruple 14 day therapy (ranitidine 300mg po BID + bismuth 30ml po QID + metronidazole 250mg po BID + tetracycline 500mg po QID; ER >80%; ITT).

- Classic triple therapy (bismuth 30ml po QID + metronidazole 250mg po QID + tetracycline 500mg QID x14days; ER ~78%; ITT).

### Testing for H. pylori Infection

- Testing for H. pylori infection is indicated in patients with active peptic ulcer disease, a past history of documented peptic ulcer, or gastric MALT lymphoma, after endoscopic resection of gastric cancer, patients with uninvestigated dyspepsia who are <50y & have no “alarm features” (bleeding, anemia, early satiety, unexplained weight loss, dysphagia, vomiting, family hx GI cancer, previous esophagogastric malignancy) after ruling out NSAID or GERD symptoms.

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References

1. Micromedex 2012


Additional sources:


http://www.mumshealth.com/

15. BC 2010 Guidelines.


Delaney BC, Qune M, Moayyedi P, et al. Helicobacter pylori test and treat versus proton pump inhibitor in initial management of dyspepsia in primary care: multicentre randomised controlled trial (MRC-CUBE trial). BMJ. 2008 Feb 29; [Epub ahead of print] Test and treat and acid suppression are equally cost effective in the initial management of dyspepsia. Empirical acid suppression is an appropriate initial strategy. As costs are similar overall, general practitioners should discuss with patients at which point to consider H pylori testing.


FDA has announced approval of a breath test for Helicobacter pylori for use in children aged 3 to 17 years. BreathTek UBT was previously approved for adult use. The first breath test for use in children ages 3 to 17 years to detect Helicobacter pylori (H. pylori) bacterial infections, responsible for chronic stomach inflammation (gastritis) and ulcers, was approved by the U.S. Food and Drug Administration (FDA) on Feb. 22, 2012.


Fuccio L, Minardi ME, Zagarli RM, Grilli D, Magrini N, Bazzoli F. Meta-analysis: duration of first-line proton-pump inhibitor-based triple therapy for Helicobacter pylori eradication. Ann Intern Med. 2007 Oct 16;147(8):553-62. Available data suggest that extending triple therapy beyond 7 days is unlikely to be a clinically useful strategy. (Link) Can. Dec 2007: Seven days of treatment with triple therapy—a proton pump inhibitor (PPI) + clarithromycin (Biaxin) + amoxicillin or metronidazole—produces rates of eradication that are nearly as good as 10 days to 14 days of treatment, and are equally good if only high-quality research is considered. (LOE = 1a+)


Gisbert JP, Pajares JM. Systematic review and meta-analysis: is 1-week proton pump inhibitor-based triple therapy sufficient to heal peptic ulcer? Aliment Pharmacol Ther. 2005 Apr 1;12(7):795-804. CONCLUSION: In pts with peptic ulcer & H. pylori infection, prolonging therapy with proton pump inhibitor after a triple therapy for 7 days with a PPI & two antibiotics is not necessary to induce ulcer healing.


Jafri NS, Hornung CA, Howden CW. Meta-analysis: Sequential Therapy Appears Superior to Standard Therapy for Helicobacter pylori Infection in Patients Naïve to Treatment. Ann Intern Med. 2008 May 19. [Epub ahead of print] Sequential therapy appears superior to standard triple therapy for eradication of H. pylori infection. If RCTs in other countries confirm these findings, 10-day sequential therapy could become a standard treatment for H. pylori infection in treatment-naïve patients.


For every 8 patients treated with eradication therapy instead of placebo, one additional patient will have a 50% improvement in symptoms 1 year later. However, the range of this estimate is quite large (4.6 - 38.8).


Prasertpetmanee S, Mahachai V, Vilaichone RK. Improved Efficacy of Proton Pump Inhibitor - Amoxicillin - Clarithromycin Triple Therapy for Helicobacter pylori Eradication in Low Clarithromycin Resistance Areas or for Tailored Therapy. Helicobacter. 2013 Jan 29. (14 days treatment)


Rokkas T, Scehopoulos P, Robotis I, Margantinis G, Pistiolas D. Cumulative H. pylori eradication rates in clinical practice by adopting first and second-line regimens proposed by the Maastricht III consensus and a third-line empirical regimen. Am J Gastroenterol. 2009 Jan;104(1):21-5. A sequence of 3 strategies was successful in eradicating H. pylori in 89% of patients by intention-to-treat analysis and in 98% of patients by per-protocol analysis. (LOE = 2b)


Sabbì T, et al. Efficacy of noninvasive tests in the diagnosis of Helicobacter pylori infection in pediatric patients. Arch Pediatr Adolesc Med 2005; 159:238-41. (InfoPOEMs: In children with significant & persistent or recurrent symptoms of upper gastrointestinal disease, fecal antigen testing for Helicobacter pylori is more reliable than serology. Although not part of this study (since serology is unreliable for monitoring response to treatment), direct testing of the stool also provides a more reliable means of evaluating treatment response. (LOE = 1c))

Saad RJ, et al. Levofloxacin-based triple therapy versus bismuth-based quadruple therapy for persistent Helicobacter pylori infection: a meta-analysis. Am J Gastroenterol. 2006 Mar;101(3):488-96. (InfoPOEMs: A 10-day regimen of levofloxacin, amoxicillin, and a proton pump inhibitor (PPI) is more effective and better tolerated than the traditional 7-day 4-drug bismuth-based regimen for patients who have persistent Helicobacter pylori (HP) infection despite previous treatment. (LOE = 1a)) (see also Pharmacist’s Letter: Levofloxacin for Persistent H. Pylori Infection, May 2006)


Vaira D, et al. Sequential therapy versus standard triple-drug therapy for Helicobacter pylori eradication: a randomized trial. Ann Intern Med. 2007 Apr 17;146(8):556-63. n=300 Sequential therapy is statistically significant compared with standard therapy for eradicating H. pylori infection and is statistically significantly more effective in patients with clarithromycin-resistant strains. Side effects are similar with both treatment regimens and are rarely severe enough to cause discontinuation of therapy.

Valle PC, et al. "Test, score and scope": a selection strategy for safe reduction of upper gastrointestinal endoscopies in young dyspeptic patients referred from primary care.
For men younger than 45 years, the endoscopic yield is very low for those without Helicobacter pylori infection, nonsteroidal anti-inflammatory drug (NSAID) use, unintended weight loss, or anemia. (LOE = 2b)


Zapata-Colindres JC, et al. The association of Helicobacter pylori infection and nonsteroidal anti-inflammatory drugs in peptic ulcer disease. Can J Gastroenterol. 2006 Apr;20(4):277-80. The development of PUD was observed earlier in the combined H pylori and NSAID group than in patients with only NSAID use. This suggests a synergic effect between the two risks factors in the development of PUD.


Zagari RM, Bianchi-Porro G, et al. Comparison of 1 and 2 weeks of omeprazole, amoxicillin and clarithromycin treatment for Helicobacter pylori eradication: the HYPER Study. Gut. 2007 Apr;56(4):475-9. Epub 2006 Oct 6. n=909. CONCLUSIONS: 1-week and 2-week triple treatments for H pylori eradication are similar in terms of efficacy, safety and patient compliance. (InfoPOEMs: One week of omeprazole, amoxicillin, and clarithromycin given twice daily is as effective at eradicating Helicobacter pylori (HP) as 2 weeks of treatment. It also costs less and is less burdensome for patients. (LOE = 1b))


Zullo A, Hassan C, Andriani A, et al.. Eradication Therapy for Helicobacter pylori in Patients With Gastric MALT Lymphoma: A Pooled Data Analysis. Am J Gastroenterol. 2009 Jun 16. [Epub ahead of print] This was the first comprehensive (approximately 1,300 patients) analysis of the therapeutic management of H. pylori in gastric lymphoma patients. Data suggest that this infection is easily managed in these patients, being cured in nearly all cases.