Preventing gastric cancer by treating H. pylori

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Dr. Barry Marshall
Nobel Prize Laureate
2005
H. Pylori is a Common Gastrointestinal Infection

• 36% of US population infected
• Duration of human infection is usually lifelong
• Individuals are typically infected by 10 years of age
• Gram negative spiral bacterium with unipolar flagella which lives on gastric mucosa
• Can cause infection leading to
  • Atrophic gastritis
  • Peptic ulcer
  • Gastric cancer

H. Pylori Infection Can Follow Several Paths and Lead to Adverse Sequelae

H. Pylori Is the #1 Risk Factor for Gastric Cancer

• Classified as a group 1 carcinogen by The International Agency for Research on Cancer (IARC), indicating that there is definitive evidence to conclude H. pylori can cause cancer in humans¹,²

• University of Pennsylvania conducted analysis of over 370,000 H. pylori patients in the VA health administration database showed that successfully eradication H. pylori led to a 75% reduction in the risk of gastric cancer³

• However, in a recent survey of over 275 US prescribers, only 34% believed H. pylori was a major risk factor for gastric cancer⁴

4. November 2019 survey of 279 prescribers including gastroenterologists (n=75), PCP (n=154), NP/PA in primary care (n=25), and NP/PA in gastroenterology practices (n=25).
Latest Evidence on Gastric cancer and H. pylori

• Gastric cancer is a common and often lethal cancer and like cervical and liver cancers, can be largely attributed to an infectious cause (H. pylori)\textsuperscript{1}

• Germline pathogenic variants in cancer – predisposing genes are also essential in surveillance and prevention of gastric cancer, e.g. CDH1 is a risk gene for hereditary diffuse gastric cancer

• Usui Y et al. evaluated the association between germline pathogenic variants in 27-cancer predisposing genes and the risk of gastric cancer in a sample of 10,426 gastric cancer patients and 38,153 control patients\textsuperscript{2}

• Germline pathogenic variants in 9 genes (APC, ATM, BRCA1, BRCA2, CDH1, MLH1, MSH2, MSH6, and PALB2)\textsuperscript{2} were associated with the risk of gastric cancer. Specifically an interaction between H. pylori infection and pathogenic variants in homologous-recombination genes with respect to the risk of gastric cancer

Figure 2. Cumulative Risk of Gastric Cancer through 85 Years of Age According to Germline Pathogenic-Variant Carrier Status and *Helicobacter pylori* Infection Status.

Cumulative risks of gastric cancer were estimated for carriers and noncarriers of germline pathogenic variants and persons who were positive and negative for *H. pylori* infection in the Hospital-based Epidemiologic Research Program at Aichi Cancer Center. Noncarriers were defined as persons without pathogenic variants in gastric cancer risk genes (APC, ATM, BRCA1, BRCA2, CDH1, MLH1, MSH2, MSH6, and PALB2). Only carriers of pathogenic variants in homologous-recombination (HR) genes (ATM, BRCA1, BRCA2, and PALB2) are shown in this figure because of the limited number of participants with variants in non-HR genes (APC, CDH1, MLH1, MSH2, and MSH6).
Latest Evidence on Gastric cancer and H. pylori continued

• H. pylori infection influences the risk of gastric cancer in patients with the aforementioned pathologic variants

• The lifetime risk of gastric cancer was 45.5% among persons with a pathogenic variant of homologous recombination gene and H. pylori infection

• In contrast, the risk was <5% among non-infected carriers and 14.4% among infected non-carriers of the homologous recombination gene

• This suggests that hereditary contribution to the risk of gastric cancer is more important than previously though and implies that DNA damage induced by H. pylori, if repaired incorrectly or not repaired at all, is a major driver of gastric carcinogenesis

DNA Repair Mutation Presence With And Without H. Pylori
Conclusions

1. In persons known to carry a pathogenic variant homologous-recombination gene the evaluation and eradication of H. pylori is a paramount importance

2. Since the carrier status of a pathogenic variant of homologous-recombination gene is not available clinically then the recommended best clinical strategy is to evaluate and treat H. pylori infection as well as confirming successful eradication
Several Diagnostic Testing Options Available

• Non-endoscopic
  • Urea breath test (UBT)*
  • Stool antigen test*
  • Serology - inadequate test for active infection
    • May remain positive even after successful eradication
    • ACG guidelines generally recommend against serology for H. pylori

  • *Patients need to be off PPIs for 2 weeks for valid UBT or stool antigen results.

• Endoscopic Biopsy
  • Rapid urease test
  • Histology
  • Culture

2017 ACG Guideline on Testing and Treating

- All patients with a positive test of active infection with H. pylori should be offered treatment

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Strength of recommendation</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active or history of PUD</td>
<td>Strong</td>
<td>High</td>
</tr>
<tr>
<td>Low-grade MALT lymphoma</td>
<td>Strong</td>
<td>Low</td>
</tr>
<tr>
<td>History of endoscopic resection of early gastric cancer</td>
<td>Strong</td>
<td>Low</td>
</tr>
<tr>
<td>Uninvestigated dyspepsia (Age &lt; 60; no alarm features)</td>
<td>Conditional</td>
<td>Moderate</td>
</tr>
<tr>
<td>Endoscopy for dyspepsia</td>
<td>Strong</td>
<td>High</td>
</tr>
<tr>
<td>Long-term, low-dose aspirin</td>
<td>Conditional</td>
<td>Moderate</td>
</tr>
<tr>
<td>Prior to chronic NSAID therapy</td>
<td>Strong</td>
<td>Moderate</td>
</tr>
<tr>
<td>Established on NSAID therapy</td>
<td>Conditional</td>
<td>Low</td>
</tr>
<tr>
<td>Unexplained iron deficiency</td>
<td>Conditional</td>
<td>Low</td>
</tr>
</tbody>
</table>

Treatment of H. Pylori Infection: General Considerations

• Require a positive test
• Offer treatment to all who test positive
• Explain the treatment, possible side effects, and potential complications of treatment non-compliance
• Choice of treatment depends on
  • Availability of local antimicrobial sensitivity and resistance rates
  • History of macrolide or quinolone exposure
  • Presence of true penicillin allergy
• Confirm eradication in everyone
Current Most Commonly Prescribed First Line H. Pylori Regimens

- Clarithromycin triple therapy (14 days)
  - PPI (BID)
  - Clarithromycin (500mg BID)
  - Amoxicillin (1gm BID) or metronidazole (500mg TID)

- Bismuth quadruple therapy [10–14 days (14 days associated with higher eradication rates)]
  - PPI (BID)
  - Bismuth subcitrate (part of Pylera, 420mg QID) or Bismuth subsalicylate (300mg or 524mg QID)
  - Tetracycline (500mg QID)
  - Metronidazole (250mg QID or 500mg TID)

Resistance Compromises Clarithromycin Based Treatment as a Reliable Option

• In the US, >80% of currently prescribed regimens contain clarithromycin

• A recent study at TTUHSC El Paso evaluating H. pylori treatment regimens and subsequent eradication showed that 78.6% of patients received clarithromycin based regimens with an eradication rate of 83.2% in contrast to Bismuth based quadruple regimens' eradication rate of 91.5% (p<0.05)¹

• Eradication rates for current standard of care therapies such as clarithromycin based triple therapy range from 60-75%²,³,⁴

• Treatment failure risk increases 3-7-fold in clarithromycin resistant strains treated with clarithromycin containing regimens⁵,⁶

1. Guzman J, Kalas MA, et al. The Efficacy of Bismuth Based Quadruple Therapy Compared With Clarithromycin-Based Triple Therapy for Helicobacter pylori in a Predominantly Hispanic Population: A Retrospective Cohort Study. Poster presented at ACG 2022
## 2017 ACG Guideline Advises When to Avoid Clarithromycin-based H. pylori Therapy

<table>
<thead>
<tr>
<th>Question</th>
<th>ACG Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has my patient ever taken a macrolide antibiotic?</td>
<td>YES Avoid Clarithromycin-based therapy</td>
</tr>
<tr>
<td></td>
<td>NOT SURE Avoid Clarithromycin-based therapy</td>
</tr>
<tr>
<td>Are my local H. pylori resistance rates for clarithromycin &gt; 15%?</td>
<td>YES Avoid Clarithromycin-based therapy</td>
</tr>
<tr>
<td></td>
<td>NOT SURE Avoid Clarithromycin-based therapy</td>
</tr>
<tr>
<td>Has this patient ever been treated for H. pylori with a clarithromycin-based regimen?</td>
<td>Yes Avoid Clarithromycin-based retreatment</td>
</tr>
<tr>
<td></td>
<td>NOT SURE Avoid Clarithromycin-based retreatment</td>
</tr>
</tbody>
</table>

# H. Pylori approved salvage regimens

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Drugs (doses)</th>
<th>Dosing frequency</th>
<th>Duration (Days)</th>
<th>FDA approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bismuth quadruple</td>
<td>PPI (standard dose)</td>
<td>BID</td>
<td>14</td>
<td>No*</td>
</tr>
<tr>
<td></td>
<td>Bismuth subcitrate (120–300 mg) or subsalicylate (300 mg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tetracycline (500 mg)</td>
<td>QID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metronidazole (500 mg)</td>
<td>TID or QID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levofloxacin triple</td>
<td>PPI (standard dose)</td>
<td>BID</td>
<td>14</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Levofloxacin (500 mg)</td>
<td>QID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amox (1 grm)</td>
<td>BID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concomitant</td>
<td>PPI (standard dose)</td>
<td>BID</td>
<td>10–14</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Clarithromycin (500 mg)</td>
<td>BID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amoxicillin (1 grm)</td>
<td>BID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nitroimidazole (500 mg)</td>
<td>BID or TID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rifabutin triple</td>
<td>PPI (standard dose)</td>
<td>BID</td>
<td>10</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Rifabutin (300 mg)</td>
<td>QID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amox (1 grm)</td>
<td>BID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-dose dual</td>
<td>PPI (standard to double dose)</td>
<td>TID or QID</td>
<td>14</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Amox (1 grm TID or 750 mg QID)</td>
<td>TID or QID</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*PPI, bismuth, tetracycline, and metronidazole prescribed separately is not an FDA-approved treatment regimen. However, Pylera, a combination product containing bismuth subcitrate, tetracycline, and metronidazole combined with a PPI for 10 days is an FDA-approved treatment regimen.
Sequential therapy consists of a PPI and amoxicillin for 5–7 days followed by a PPI, clarithromycin, and a nitroimidazole for 5–7 days.

Hybrid therapy consists of a PPI and amoxicillin for 7 days followed by a PPI, amoxicillin, clarithromycin and a nitroimidazole for 7 days.
Confirmation of Eradication is Critical

• Symptom relief does not correlate with eradication
  • 2013 study demonstrated no difference in dyspeptic symptoms at 1 year post-treatment between H. pylori-eradicated and H. pylori-persistent patients\(^1\)
  • ACG guideline recommends routine post-treatment testing\(^2\)
    • UBT or fecal antigen
    • Endoscopy based testing only if endoscopy is clinically indicated
• Post treatment testing should be obtained at least 4 weeks after treatment completion
• PPI should be held for 1-2 weeks prior to testing

Role of probiotics in first-line therapy

• There is growing interest in the United States of probiotics as adjuvant therapy in the treatment of *H. pylori* infection.

• Emerging evidence suggests an inhibitory effect of *Lactobacillus* and *Bifidobacterium* species on *H. pylori*.

• Furthermore, these probiotic strains may also help to reduce the side effects of eradication therapies and improve compliance with therapy.

• A meta-analysis of 10 clinical trials of adjuvant probiotics in patients with *H. pylori* infection demonstrated increased cure rates with probiotic supplementation.
Whats New in H. pylori Management?

- Potassium competitive acid blockers (PCA-B):
  - Licensed mainly in Asia and South America
  - Fast onset of action and more profound control of acid secretion compared to PPIs
  - Examples include: revaprazan, vonoprazan, tegoprazan, and fexuprazan
- Phase 3 trials of vonoprazan in US and Europe done for H. pylori infection and erosive esophagitis

Abdel-Aziz et al, Aliment Pharmacol Ther 2021;53:794
Comparison of vonoprazan and lansoprazole on 24-hour intragastric pH

Laine et al, Am J Gastroenterol 2022;117:1158
Summary

• Resistance rates are increasing
• Avoid clarithromycin unless known local susceptibility
• Never re-treat with clarithromycin
• Resistance to amoxicillin, tetracycline, and rifabutin remains very rare
• Future availability of testing by next gen sequencing on stool or gastric mucosal biopsy likely to change practice
• H. pylori and gastric cancer is related to genomic profile and treatment can prevent significant morbidity and mortality
• Newer medication regimens are being studied (including PCA-B)
Thank You
H. pylori: Diagnosis and Management

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Assistant Professor of Medicine
Baylor College of Medicine

Disclosures: None
Objectives

• Describe *H. pylori* diagnostic tools and their appropriate use
• Discuss treatment regimens
• Describe strategies for documentation of eradication
A 23 year old female complains of 6 weeks of epigastric burning discomfort, bloating and postprandial nausea unrelieved by current use of antacids & OTC PPI. The best approach to the diagnosis of *H. pylori* infection in this patient is:
A. Immediate *H. pylori* serology
B. Immediate *H. pylori* stool antigen
C. Endoscopy with rapid urease test (RUT)
D. Immediate 13C Urea breath test
E. D/C PPI for 2 weeks then *H. pylori* stool antigen EIA
## Diagnosis of *Helicobacter pylori* Infection

<table>
<thead>
<tr>
<th>Non Invasive (global)</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urea Breath Test</strong> ((^{13}\text{C}))</td>
<td>&gt; 90-95%</td>
<td>&gt; 90-95%</td>
<td>Live <em>H. pylori</em></td>
</tr>
<tr>
<td><strong>Stool Antigen</strong> (monoclonal)</td>
<td>&gt; 90-95%</td>
<td>&gt; 90-95%</td>
<td>Live &amp; dead <em>H. pylori</em></td>
</tr>
<tr>
<td><strong>Serology</strong></td>
<td>85%</td>
<td>79%</td>
<td>Detects Exposure</td>
</tr>
<tr>
<td><strong>Biopsy-based (sampling error)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Urease test</strong></td>
<td>90%</td>
<td>95%</td>
<td>2-5 Bx recommended</td>
</tr>
<tr>
<td><strong>Histology</strong></td>
<td>90-95%</td>
<td>95-98%</td>
<td></td>
</tr>
<tr>
<td><strong>Culture</strong></td>
<td>73%</td>
<td>100%</td>
<td>Difficult</td>
</tr>
</tbody>
</table>

2012, BMJ, Braden
Testing Limitations for *H. pylori*

**False negatives** due to decrease *H. pylori* burden

Recommend delay diagnostic testing until:

- PPI stopped for 2-4 weeks (OTC antacids & H2RA do not affect UBT/SA testing)
- Antibiotics, bismuth stopped for 4 weeks
- Bleeding stopped for 4-8 weeks

2019. NEJM. Crowe. *H. pylori* infection
Up-to-date. 2024
Question

A 23 year old female complains of 6 weeks of epigastric burning discomfort, bloating and postprandial nausea unrelieved by current use of antacids & OTC PPI.

The best approach to the diagnosis of *H. pylori* infection in this patient is:
A. Immediate *H. pylori* serology
B. Immediate *H. pylori* stool antigen
C. Endoscopy with rapid urease test (RUT)
D. Immediate 13C Urea breath test
E. D/C PPI for 2 weeks then *H. pylori* stool antigen EIA
Initial Diagnosis of *H. pylori* with Dyspepsia

- Urea breath test (UBT)
  - Test and treat in younger population (<60 y/o)
- Stool antigen test (SAT)

- Endoscopy mandatory if >60 y/o or “Alarm symptoms or signs”:
  - Unexplained iron-def anemia
  - GI bleeding
  - Unintended weight loss
  - Palpable mass
  - Severe abdominal pain
  - Persistent vomiting
  - Progressive dysphonia/odynophagia
A 35 y/o male presents for evaluation of 2-year history of substernal burning after large meals. He has no other medical problems aside from obesity with BMI 35. Which is the best approach in this patient?

A. Stool antigen test for *H. pylori*
B. Urea breath test for *H. pylori*
C. No testing for *H. pylori*
D. Serological testing for *H. pylori*
E. Empiric therapy for *H. pylori*
Question

• A 35 y/o male presents for evaluation of 2-year history of substernal burning after large meals. He has no other medical problems aside from obesity with BMI 35. Which is the best approach in this patient?
  A. Stool antigen test for *H. pylori*
  B. Urea breath test for *H. pylori*
  C. No testing for *H. pylori*
  D. Serological testing for *H. pylori*
  E. Empiric therapy for *H. pylori*
**Explanation**

*H. pylori* is not implicated as an etiological factor in gastroesophageal reflux disease

Treatment for (eradication of *H. pylori*) can have unpredictable effects on GERD

Serology is not recommended as first line test for *H. pylori* in most circumstances

Question

A 44 year old woman presents with chronic dyspepsia. *H. pylori* antigen is positive. As a child, she was treated repeatedly with Penicillin/Amoxicillin for recurrent tonsillitis.

What do you recommend for therapy?

A. Clarithromycin + Amoxicillin + PPI
B. Metronidazole + erythromycin + PPI
C. Bismuth subsalicylate + TCN + metronidazole + PPI
D. Metronidazole + Amoxicillin + PPI
E. PPI Therapy alone given her age
Question

A 44 year old woman presents with chronic dyspepsia. *H. pylori* antigen is positive. As a child, she was treated repeatedly with **Penicillin/Amoxicillin** for recurrent tonsillitis.

What do you recommend for therapy?

A. Clarithromycin+ Amoxicillin + PPI  
B. Metronidazole+ erythromycin + PPI  
C. Bismuth subsalicylate +TCN+ metronidazole +PPI  
D. Metronidazole +Amoxicillin + PPI  
E. PPI Therapy alone given her age
Clarithromycin resistance is common in many regions of the US. Past exposure to amoxicillin could increase risk for resistance.

2019. NEJM. Crowe. H. pylori infection
### Evidence-based treatment regimens for H. pylori infection in North America
Listed in Recommend order

<table>
<thead>
<tr>
<th>Treatment Regimen</th>
<th>Dosage</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarithromycin-based triple therapy‡</td>
<td>PPI, clarithromycin, and amoxicillin (twice daily for all antibiotics)</td>
<td>14 days, Recommended unless patient has documented allergy to ampicillin or high level of clarithromycin resistance</td>
</tr>
<tr>
<td>Bismuth-based quadruple therapy (Pylera‡)</td>
<td>PPI, bismuth, tetracycline, and nitroimidazole (four times daily for all antibiotics)</td>
<td>10–14 days, Recommended if patient has high level of clarithromycin resistance or history of macrolide use</td>
</tr>
<tr>
<td>Concomitant therapy</td>
<td>PPI, clarithromycin, amoxicillin, and nitroimidazole (twice daily for all antibiotics)</td>
<td>10–14 days, Not appropriate in patient with high level of clarithromycin resistance or documented allergy to ampicillin</td>
</tr>
<tr>
<td>Sequential therapy</td>
<td>PPI and amoxicillin; then PPI, clarithromycin, and nitroimidazole (twice daily for all antibiotics)</td>
<td>7, then 7 days, Not appropriate in patient with high level of clarithromycin resistance or documented allergy to ampicillin</td>
</tr>
<tr>
<td>Hybrid therapy</td>
<td>PPI and amoxicillin; then PPI, amoxicillin, clarithromycin, and nitroimidazole (twice daily for all antibiotics)</td>
<td>7, then 7 days, Not appropriate in patient with high level of clarithromycin resistance or documented allergy to ampicillin</td>
</tr>
<tr>
<td>Levofloxacin-based triple therapy</td>
<td>PPI, levofloxacin (once daily), and amoxicillin (twice daily)</td>
<td>10–14 days, Not appropriate in patient with documented allergy to ampicillin</td>
</tr>
<tr>
<td>Fluoroquinolone-based sequential therapy</td>
<td>PPI and amoxicillin; then PPI, levofloxacin, and nitroimidazole (twice daily for all antibiotics)</td>
<td>5–7, then 5–7 days, Complicated with regard to treatment adherence; not appropriate in patient with documented allergy to ampicillin</td>
</tr>
</tbody>
</table>

Notes:

- ‡: 2019. NEJM. Crowe. H. pylori infection
**H. pylori treatment regimens**

<table>
<thead>
<tr>
<th>Author/reference/year</th>
<th>Regimen</th>
<th>Duration of therapy (days)</th>
<th>Intent to treat Eradication Rate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laine 15/1998</td>
<td>A C T B M E O L P R</td>
<td>10</td>
<td>75%*</td>
<td>(70 - 81)</td>
</tr>
<tr>
<td>Fennerty 16/1998</td>
<td>A C T B M E O L P R</td>
<td>10</td>
<td>81%</td>
<td>(74 - 88)</td>
</tr>
<tr>
<td>Laine 13/2000</td>
<td>A C T B M E O L P R</td>
<td>14</td>
<td>82%</td>
<td>(74 - 88)</td>
</tr>
<tr>
<td>Laine 14/2003</td>
<td>A C T B M E O L P R</td>
<td>10</td>
<td>78%*</td>
<td>(70 - 85)</td>
</tr>
<tr>
<td>Laine 14/2003</td>
<td>A C T B M E O L P R</td>
<td>10</td>
<td>88%</td>
<td>(82 - 93)</td>
</tr>
<tr>
<td>Bochenek 17/2003</td>
<td>A C T B M E O L P R</td>
<td>10</td>
<td>83%</td>
<td>(77 - 90)</td>
</tr>
<tr>
<td>Vakil 18/2004</td>
<td>A C T B M E O L P R</td>
<td>7</td>
<td>65%*</td>
<td>(57 - 73)</td>
</tr>
<tr>
<td></td>
<td>A C T B M E O L P R</td>
<td>7</td>
<td>77%*</td>
<td>(69 - 84)</td>
</tr>
<tr>
<td></td>
<td>A C T B M E O L P R</td>
<td>10</td>
<td>78%</td>
<td>(72 - 84)</td>
</tr>
<tr>
<td></td>
<td>A C T B M E O L P R</td>
<td>10</td>
<td>73%</td>
<td>(67 - 79)</td>
</tr>
</tbody>
</table>

E= Esomeprazole, A= Amoxicillin, C= Clarithromycin, O= Omeprazole, B= Bismuth, M=metronidazole, T= tetracycline, L=lansoprazole, P=pantoprazole, R=rabeprazole

Usual doses: PPI twice a day, Clarithromycin 500 mg twice a day, Amoxicillin 1 gram twice a day. Esomeprazole was studied in a single daily dose.

* = mean of 2 studies

Penicillin allergy?

Yes

AST available?

No

Local prevalence of clarithromycin resistance

Low (<15%)

Clarithromycin-based PPI-TT

BiQT

Levofloxacin-based regimen

PPI + rifabutin + amoxicillin or high-dose PPI + amoxicillin

BiQT

Levofloxacin-based regimen

PPI + rifabutin + clarithromycin

High (>15%) or unknown

Management based on AST

No

Individual AST should be performed; levofloxacin-based regimen can be used if H. pylori is susceptible or community resistance is <15%; otherwise, use rescue therapy.
Linaprazan Glurare (P-CAB) in Plasma

Proton pump inhibition through competition with potassium

Ionic bond to the potassium binding site

Proton Pump

PPI in Plasma

Protonation and conversion to active form (Sulphenamide)

Proton pump inhibition through covalent binding

Proton Pump
Vonaprazan (PCAB) in *H. pylori* treatment

**Patients with Clarithromycin-Resistant Strains**

- **Δ33.9 (95% CI 17.7 to 48.1) P < .001**

**All patients**

- **Δ37.7 (95% CI 20.5 to 52.6) P < .001**

2023. CGH. Chey et al.

2022. CGH. Chey et al.
Treatment Algorithm
New (2024)

1st LINE: Bismuth quad

IF FAILS

ALTERNATIVE 1st LINE
Rifabutin triple
or
PCAB amoxicillin dual

True PENICILLIN allergy?
(after allergy testing, if necessary)

YES

Resistance testing

IF FAILS

Clarithromycin susceptible

14d Clarithromycin triple

OR

Clarithromycin-resistant
Metronidazole-susceptible

14d Metronidazole triple

OR

Clarithromycin & Metronidazole
dual resistant

PREFERRED

Levofloxacin susceptible?

NO

Rifabutin triple*
or
PCAB/PPI Amoxicillin dual* or
Bismuth quad^

YES

14d Levofloxacin triple

IF FAILS

2023. CGH. Moss et al.
After treatment of this patient for *H. pylori*, the stool antigen test should be repeated:
A. On the final day of *H. pylori* therapy
B. Two weeks after completion of *H. pylori* therapy
C. Eight weeks after completion of *H. pylori* therapy
D. The test should not be repeated to assess cure
Question

After treatment of this patient for *H. pylori*, the stool antigen test should be repeated:
A. On the final day of *H. pylori* therapy
B. Two weeks after completion of *H. pylori* therapy
C. Eight weeks after completion of *H. pylori* therapy
D. The test should not be repeated to assess cure
ACG Guidelines for post-treatment testing

- Test of active infection is recommended when endoscopic follow-up is unnecessary
- Urea breath test is the most reliable non-endoscopic test to document eradication
- Testing should be performed at least 4 weeks after treatment completion
- Serologic testing in the posttreatment setting should be avoided
- Results can remain positive for years after successful eradication

Summary

• H. pylori testing should be considered in patient with dyspepsia with or without alarm symptoms
  • Alarm symptoms = endoscopy
  • Breath test, stool antigen, and gastric biopsies are options
  • Serology may be falsely positive
  • All tests except serologies are affected by PPI use
• Treatment – first line in most situations now should be BQT
  • Remember PCAB regimens
• Post-treatment testing should be performed in all patients after at least 4 weeks
Thank you!