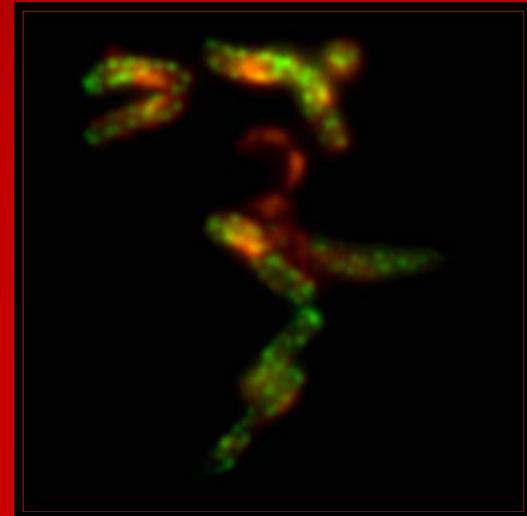
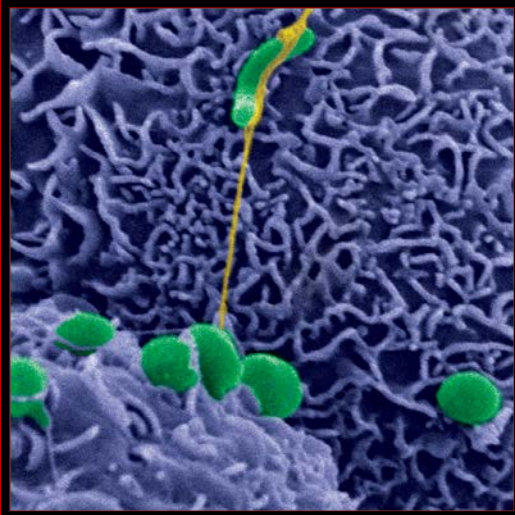


Improving ordering practices for the diagnosis of *Helicobacter pylori*

Marc Roger Couturier, Ph.D., D(ABMM)

Assistant Professor of Pathology
ARUP Medical Director:
Microbial Immunology
Parasitology & Fecal Testing
Infectious Disease Rapid Testing

May 22, 2012

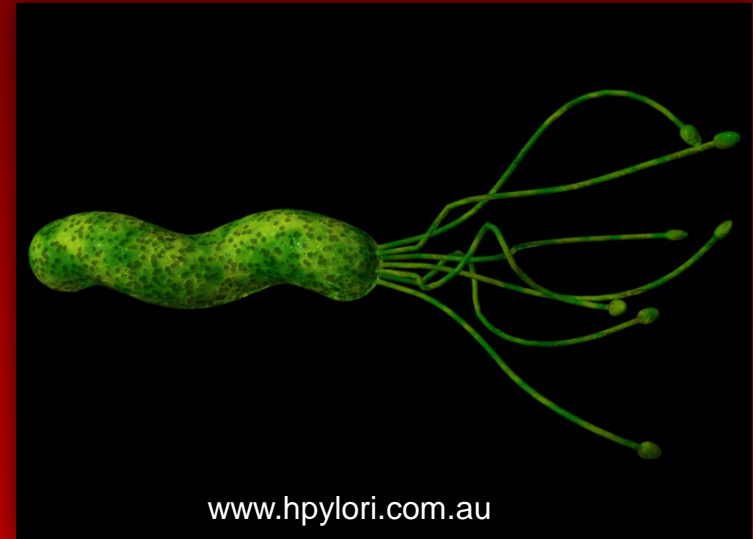


Objectives

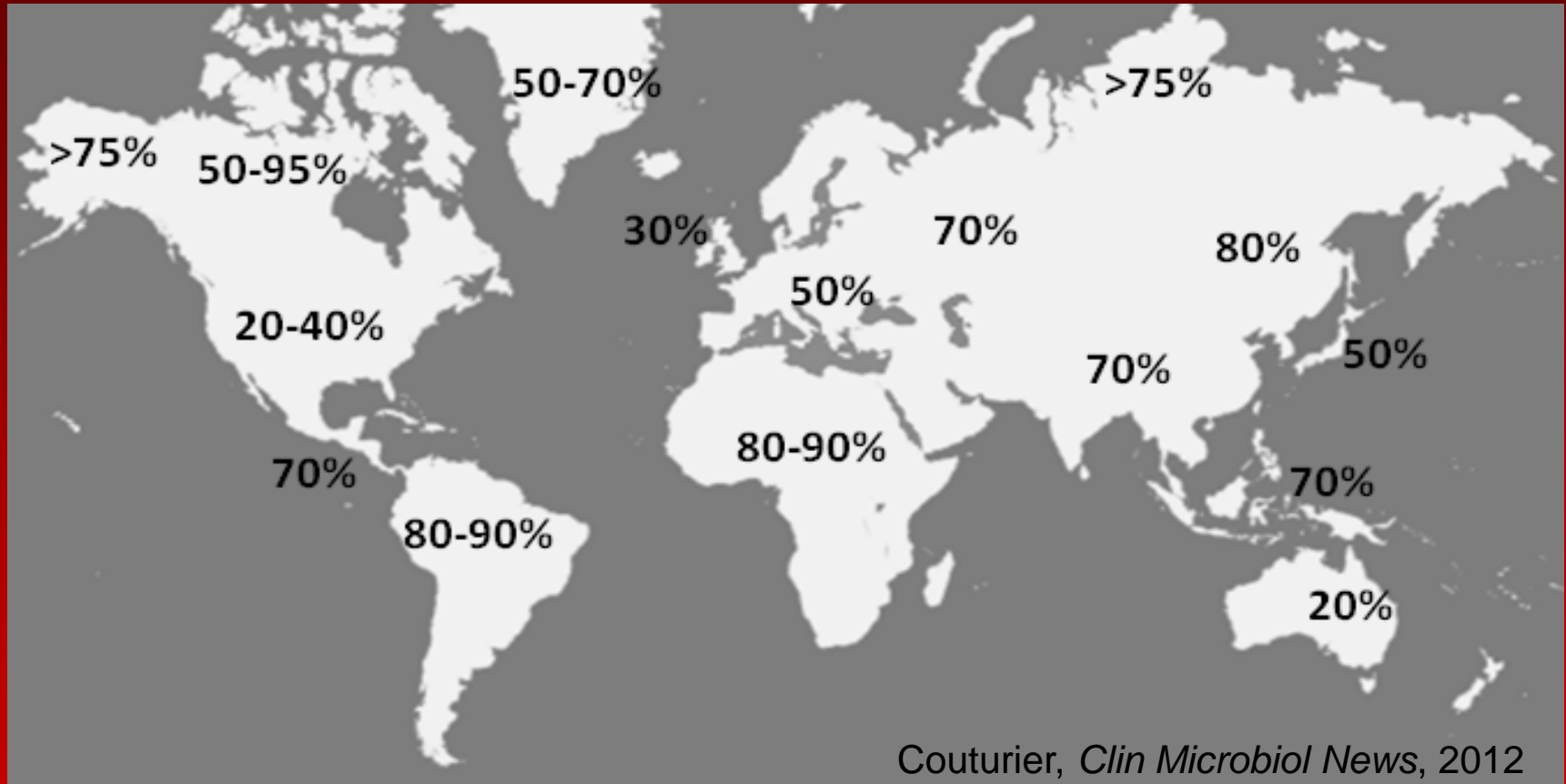
1. Briefly outline the importance of *H. pylori*
2. Review the available and recommended testing strategies for diagnosing disease
3. Discuss the challenges facing ordering practices and evolving reimbursement issues

Helicobacter pylori

- Gram negative microaerophile
- Highly motile
- Gastric pathogen of humans



Worldwide epidemiology



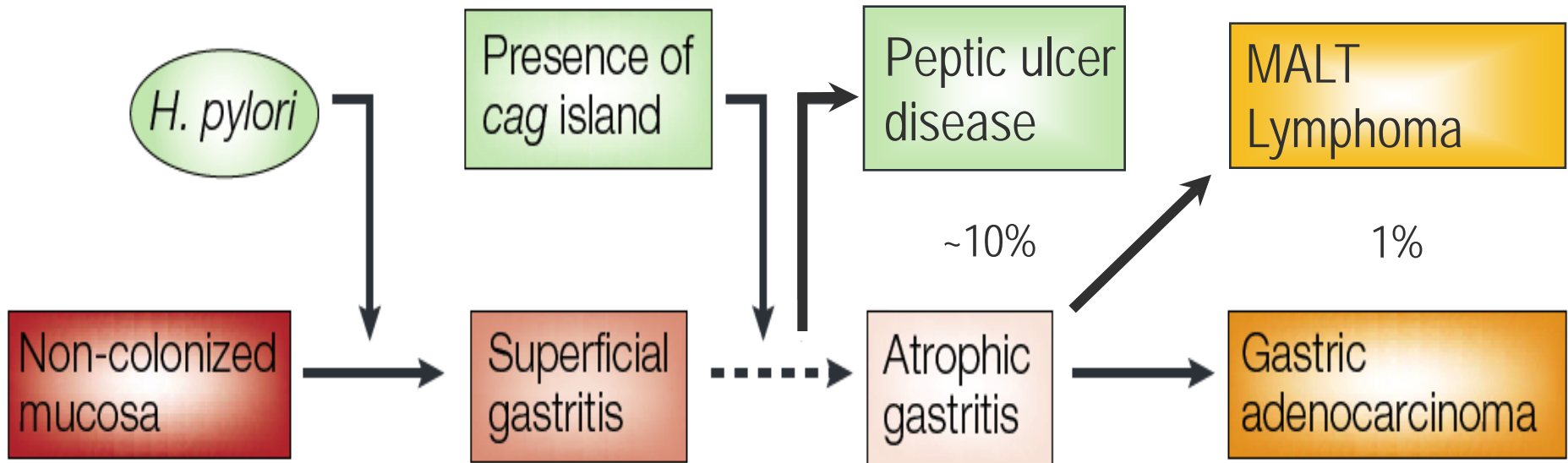
- ~ 50% of the world infected
 - Developing world/impoverished areas primarily
 - Transmission mode still unclear (familial, fecal/oral?)

H. pylori Disease Associations

- **Established:**
 - Peptic Ulcer Disease (PUD)
 - Dyspepsia
 - Non-ulcer dyspepsia (NUD)
 - Gastric adenocarcinoma
 - MALT lymphoma
- **Possible:**
 - Iron deficiency
- **Not associated:**
 - Gastroesophageal reflux disease (GERD)
 - Coronary artery disease (CAD)



Disease progression



Adapted from: Peek and Blaser, Nature Rev. Cancer, 2002

None

Mild

Severe

WHO classifies *H. pylori* as the only bacterial Class 1 Carcinogen

What effect will treatment have?

Condition	<i>H. pylori</i> causation	Effect of <i>H. pylori</i> eradication
PUD	Yes	Reduces recurrence
Dyspepsia	Yes in some	Symptom improvement in some
NUD	Possibly in few	Improvement in some
Gastric Cancer	Yes	Little effect if any
MALT lymphoma	Yes	Remission in $\geq 50\%$
Iron Deficiency	Likely in some	Improvement in some
NSAID ulcers	Naïve users?	May reduce incidence
GERD	No	None
CAD	No	None

To Treat or Not to Treat

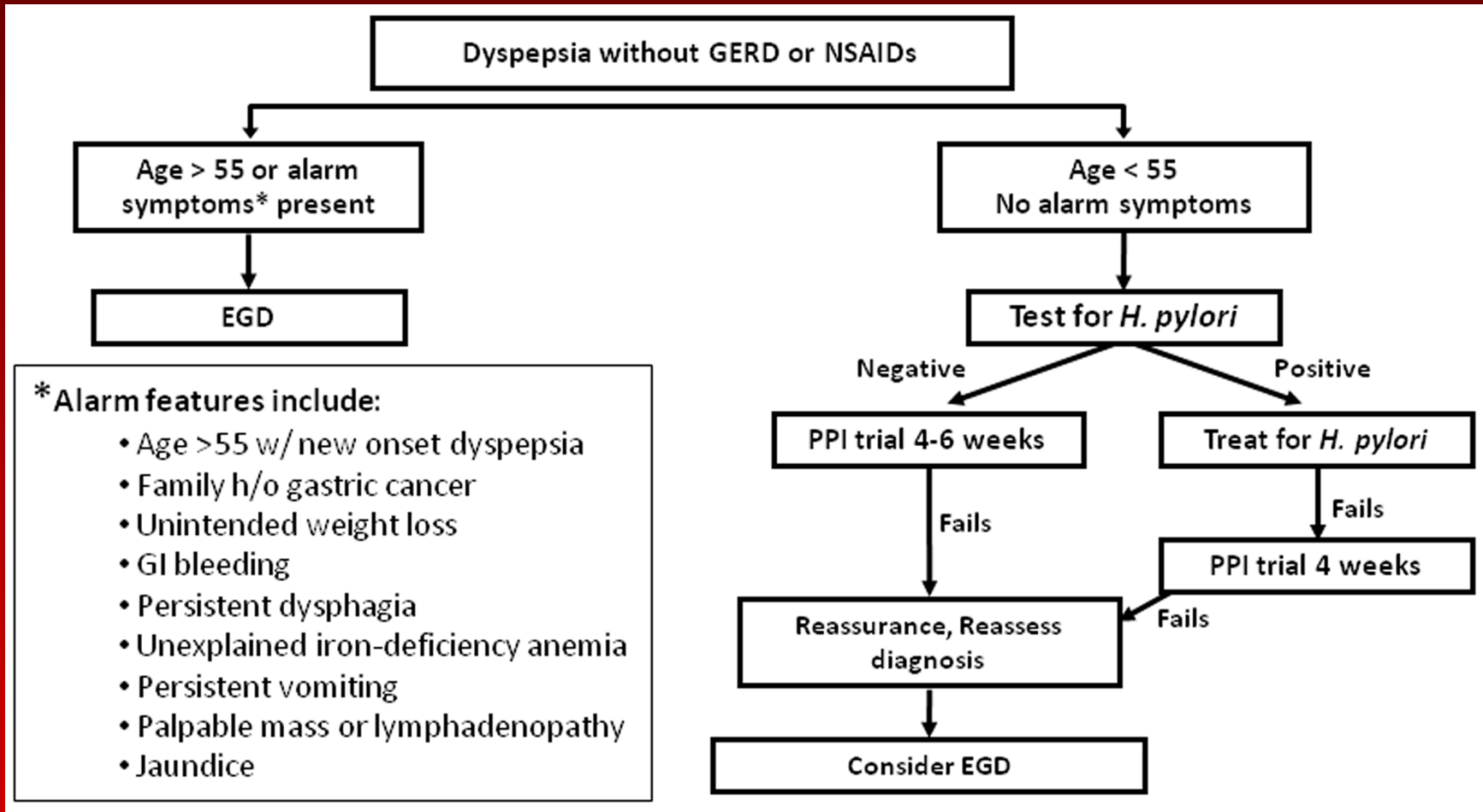
...and how to treat

First we must decide whether to test

New Dyspepsia Guidelines

- “Chronic or recurrent pain or discomfort centered in the upper abdomen”
- The AGA recommends that:
 - “Patients 55 years of age or younger without alarm features should receive *H. pylori* test and treat followed by acid suppression if symptoms remain.”
- Despite this clear mandate...
this is not happening!

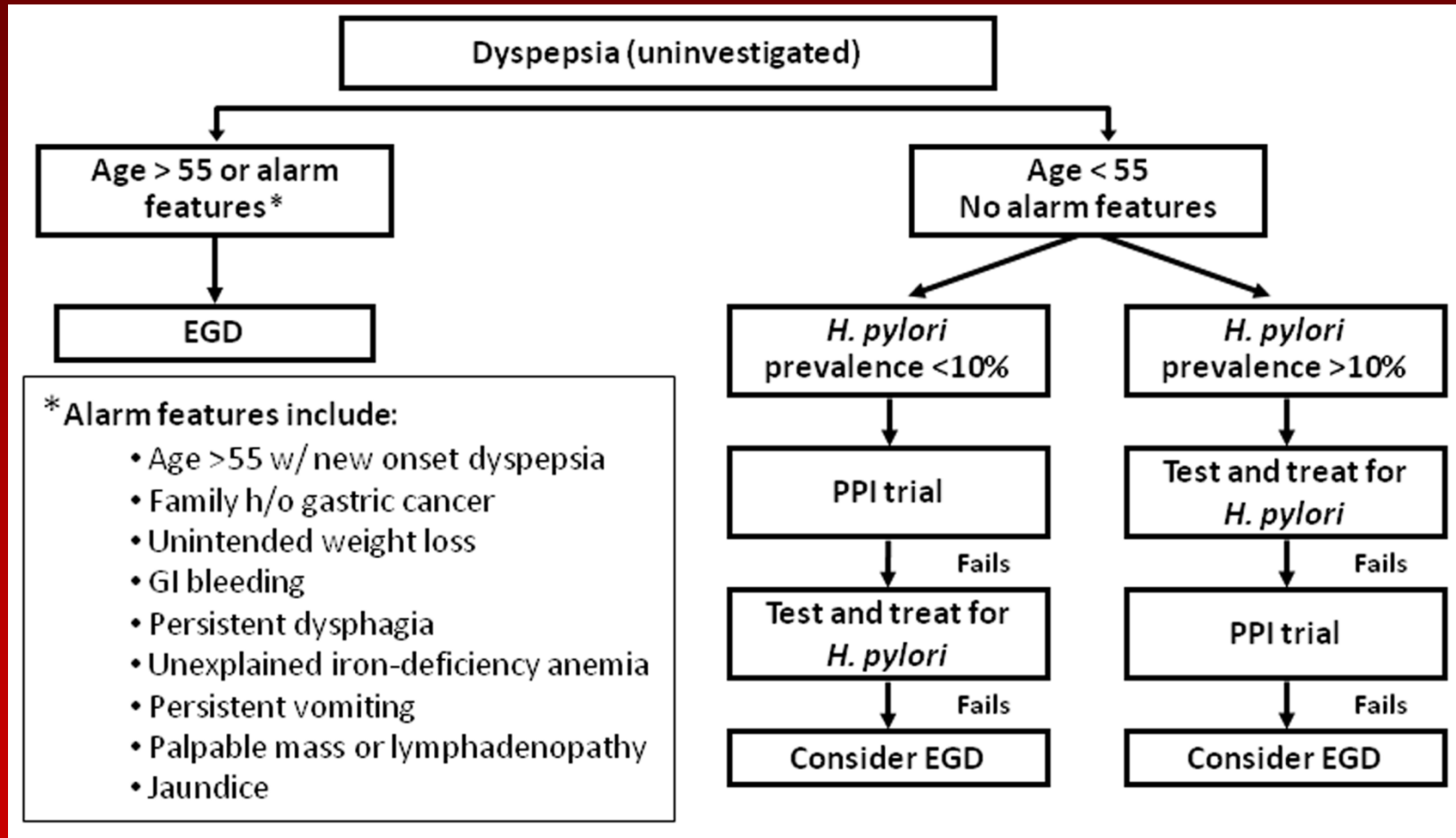
New AGA Dyspepsia Guidelines



EGD: esophagogastroduodenoscopy

Not only the AGA...

New ACG Dyspepsia Guidelines



EGD: esophagogastroduodenoscopy

Testing Methods

Laboratory testing

Endoscopy-based (Invasive)

- Culture from biopsy & susceptibility
- Rapid urease from biopsy (CLO)
- Immunohistochemistry

Non-endoscopy (Non-invasive)

- Serology (IgA, IgM, IgG)
 - No longer recommended!
- ^{13}C or ^{14}C -urea breath test
- Stool antigen test

Endoscopy-based: Culture

Advantages:

- Provides clinical isolate for susceptibility testing
- Direct evidence of infection

Disadvantages:

- Limited sensitivity
- Demands highly experienced microbiologists
- Invasive procedure



Endoscopy-based: Rapid Urease (CLO)

Advantages:

- Direct evidence of infection with CLO
- Rapid turn around time
- Limited technical expertise required

Disadvantages:

- Non-specific
- Invasive procedure



Non-Endoscopy: Urea Breath Test

^{13}C or ^{14}C -urea ingested by patient; test for isotopic CO_2 in patient breath

Advantages:

- Rapid result: can be performed in the doctors office (if available)
- Direct measure of CLO infection
- Test post treatment (confirm eradication)
- High sensitivity
- FDA approved for pediatric use

Disadvantages:

- ^{14}C involves exposure to radiation
- PPIs & antibiotics must be stopped 2 weeks prior
- Requires technical demands from physician office
- Not specific for *H. pylori*
- Limited availability & expensive



Non-Endoscopy: Stool Antigen Test

Immunoassay detection of *H. pylori* antigen in the stool

Advantages:

- Detect active infection/monitor therapy
- Least invasive
- Excellent for pre- and post-treatment
- Readily available
- High specificity and sensitivity
- FDA approved for pediatric use

Disadvantages:

- Stigma in sample type
- PPIs & antibiotics should be stopped
- Variable performance across vendors
 - Poly vs monoclonal



Non-Endoscopy: Serology

Includes IgA, IgM, and IgG testing

Advantages:

- Easily establish prevalence in research studies
- Non-invasive and inexpensive
- Not directly affected by antibiotic or PPI use

Disadvantages:

- Does NOT diagnose an active infection
- CANNOT be used as test-of-cure
- Limited sensitivity; negative result does not rule out
- Can lead to clinical confusion
- May NOT reimburse in some states/insurance carriers

Test Performance of Non-Invasive Testing

Test	Percentages (%)	
	Sensitivity	Specificity
Stool antigen test	90-95%	90-95%
Urea breath test	95-100%	90-95% ??
Serum IgG antibody*	80-85%	75-80%

*Does NOT test for active infection

“We must to it right at UUHC”

January 2011 – December 2011

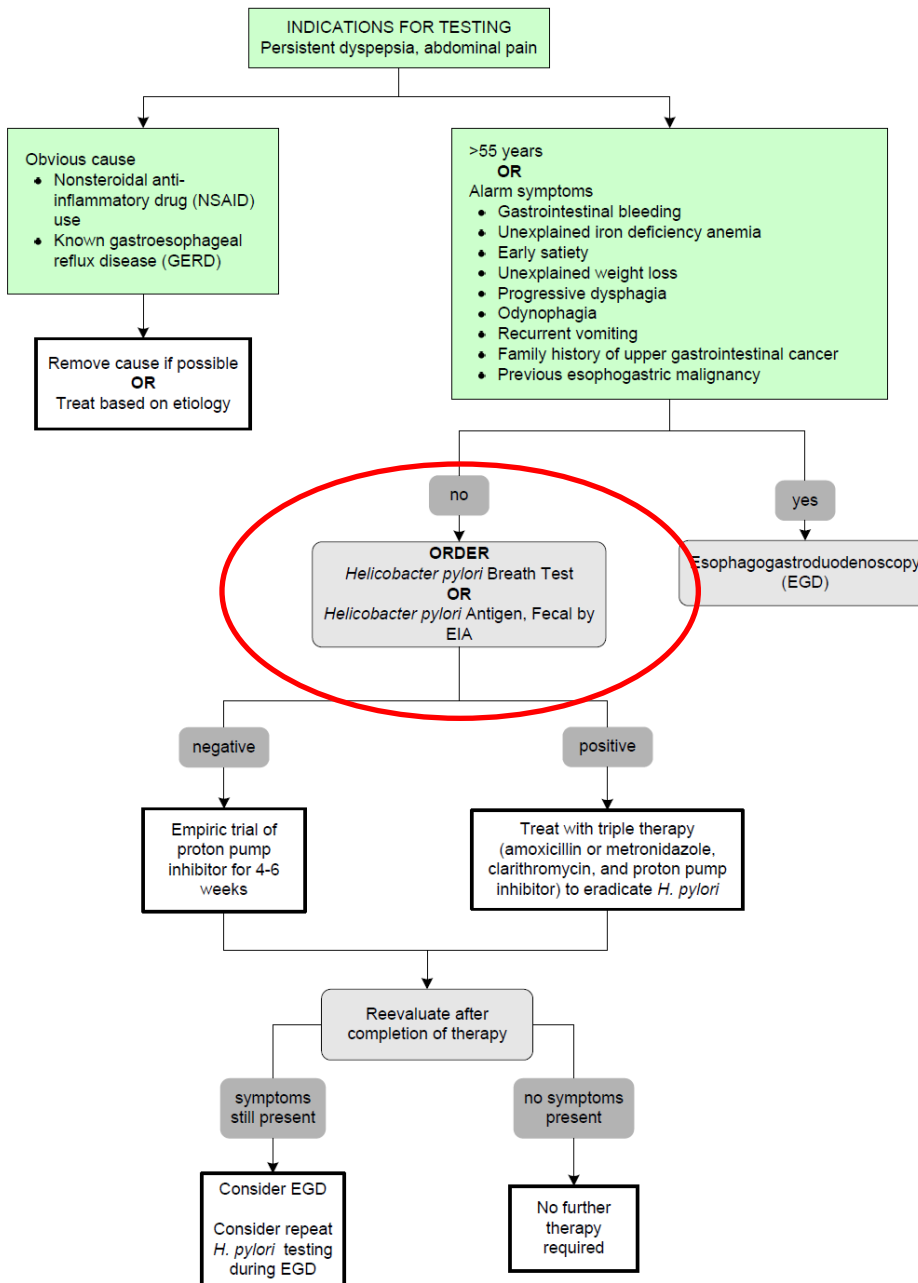
	UBT	SAT	IgG	IgG & IgA	IgA	IgM
UU Hospital	104	319	290	384	12	360

- UUH – 423 active tests / 1046 serology

~1 active : 3 passive

Helicobacter pylori Testing

[Click here for topics associated with this algorithm](#)



		<p>administration not followed correctly</p> <ul style="list-style-type: none"> • Presence of other gastric spiral organisms such as <i>H. heilmannii</i> <p>¹³C and ¹⁴C breath tests are noninvasive, but expensive due to need for special equipment</p>	
<p><i>Helicobacter pylori</i> Antigen, Fecal by EIA 0065147</p> <p>Method: Qualitative Enzyme Immunoassay</p>	<p>Determine if <i>H. pylori</i> has been eradicated or just temporarily suppressed, especially in adult patients with complicated, recurrent or refractory peptic ulcers</p> <p>Antigen testing should be performed no sooner than 1 month after therapy concluded</p>	<p>Less accurate in pediatric patients (low sensitivity)</p>	
<p><i>Helicobacter pylori</i> Antibodies, IgG & IgA 0050994</p> <p>Method: Semi-Quantitative Enzyme Immunoassay</p>	<p>Determine if <i>H. pylori</i> is causing active infection</p> <p>Not recommended for primary diagnosis</p>	<p>May require repeat testing if results are equivocal and clinical suspicion present</p>	
<p><i>Helicobacter pylori</i> by Immunohistochemistry 2003941</p> <p>Method: Immunohistochemistry</p>	<p>Aid in histologic diagnosis of <i>H. pylori</i></p> <p>Stained and returned to client pathologist; consultation available if needed</p>		

Additional Tests Available

Click the plus sign to expand the table of additional tests.

Ordering Rules for CPOE



- WARNING FLAG for IgG, IgA, IgM:
- “Do not use to diagnose *H. pylori*; order *H. pylori* urea breath test or fecal antigen by EIA”
- Active in March, will re-evaluate efficacy at 6 months.

Evolving Issues with *H. pylori* testing

- Many major insurance carriers no longer reimbursing for certain *H. pylori* testing
- Serology rapidly viewed as “medically unnecessary testing”
- SAT & UBT on a single patient in non-reimbursable



Serology non-reimbursement

- Major insurance plans NOT reimbursing for serology
 - Aetna, Cigna, BC/BS, & Geisinger
 - Likely many others
- States affected:
 - NY, CA, PA, FL, WV, KY, IN, MO, OH, WI, others?
- Specific CPT codes defined as:
“medically unnecessary”



Summary

- *H. pylori* infections remain a global health issue
- Multiple tests are available both invasive and non-invasive
- Guidelines for investigation of dyspepsia and *H. pylori* diagnosis recommend active testing:
 - UBT or SAT when EGD is not indicated
- The landscape of reimbursement is changing

Questions?

