

Indications and diagnostic tests for *Helicobacter pylori* infection

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5/9/2019

INDICATIONS FOR TESTING:

2017 guidelines from the ACG

- ❑ Low grade (MALT) lymphoma.
- ❑ Active peptic ulcer disease or past history of PUD ulcer if cure of *H.P* infection has not been documented.
- ❑ Early gastric cancer

(strong recommendation, quality of evidence: high)

Other indications :

- ❑ **Uninvestigated dyspepsia in patients <60 years without alarm features**
- ❑ **Prior to chronic treatment with NSAIDs or long-term, low-dose aspirin use**
- ❑ **Unexplained iron deficiency**
- ❑ **Adults with immune thrombocytopenia**

H pylori & long-term treatment with PPI

- Long-term treatment with PPI in patients with H. pylori infection as a means of preventing the progression to atrophic gastritis

Although eradication of the infection before initiating PPI therapy may prevent the progression to atrophic gastritis the clinical relevance of this is unclear

ACG 2017 GUIDELINE

Malfertheiner P et al. Management of HP infection: Maastricht IV/Florence consensus report. Gut 2012; 61: 646 – 664.

Format: Abstract

Send to

[Arch Intern Med.](#) 2000 May 8;160(9):1229-30.

Links between *Helicobacter pylori* infection, cobalamin deficiency, and pernicious anemia.

[Stopeck A.](#)

Comment on

Helicobacter pylori--is it a novel causative agent in Vitamin B12 deficiency? [Arch Intern Med. 2000]

PMID: 10809024 DOI: [10.1001/archinte.160.9.1229](https://doi.org/10.1001/archinte.160.9.1229)

[Indexed for MEDLINE]







An editorialist mentioned that the response may have been due to *H. pylori* eradication or to eradication of bacteria in the small intestine that interfered with uptake of the vitamin B12-IF complex (ie, the response may have been due to a mechanism unrelated to *H. pylori*)

There is insufficient evidence to support routine testing and treating of *H. pylori* in:

- ❑ Asymptomatic individuals with a family history of gastric cancer
- ❑ patients with lymphocytic gastritis
- ❑ Hyperplastic gastric polyps
- ❑ Hyperemesis gravidarum

(no recommendation, very low quality of evidence).

Guidelines for the management of *Helicobacter pylori* infection in Japan: 2016 Revised Edition

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Indication of <i>H. pylori</i> eradication	Grade of recommendation	Evidence level
<i>H. pylori</i> gastritis	1	A
Gastric ulcer/duodenal ulcer	1	A
Residual gastric mucosa after endoscopic treatment of early gastric cancer	1	A
Gastric mucosa-associated lymphoid tissue lymphoma	1	A
Gastric hyperplastic polyp	1	A
Functional dyspepsia (<i>H. pylori</i> -associated dyspepsia)	1	B
Gastroesophageal reflux disease	1	B
Immune (idiopathic) thrombocytopenic purpura	1	A
Iron deficiency anemia	1	B
Chronic urticaria	2	B
Cap polyposis	2	C
Diffuse large B-cell lymphoma (DLBCL)	2	C
Rectal MALT lymphoma	2	C
Parkinson's syndrome	2	D
Alzheimer's disease	2	D
Diabetes mellitus (DM)	3	D

Tests for Hp Infection

Non Endoscopic Tests

- Serology (qualitative or quantitative Ig G)
- Urea breath test
- Stool antigen test

Endoscopic Tests

- Histology
- RUT
- Culture
- PCR assay

Serology

(Qualitative Or Quantitative Ig G)

Advantages

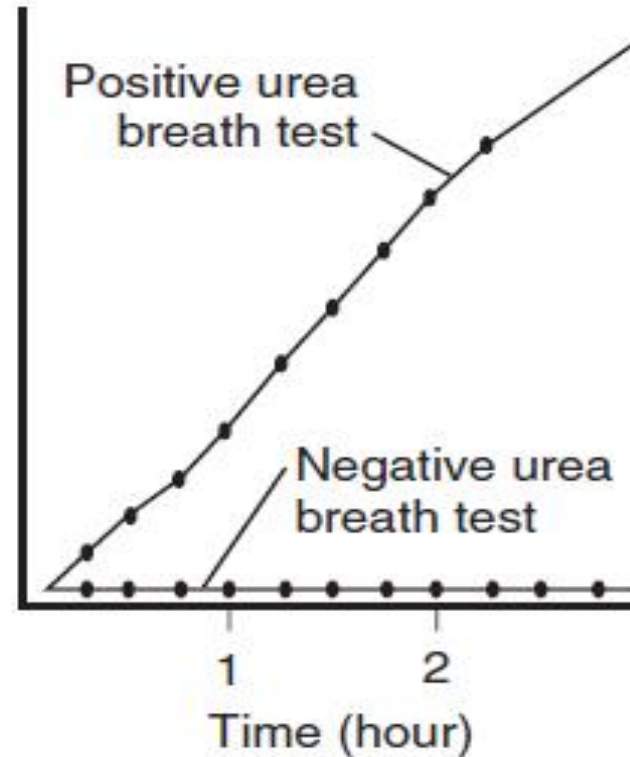
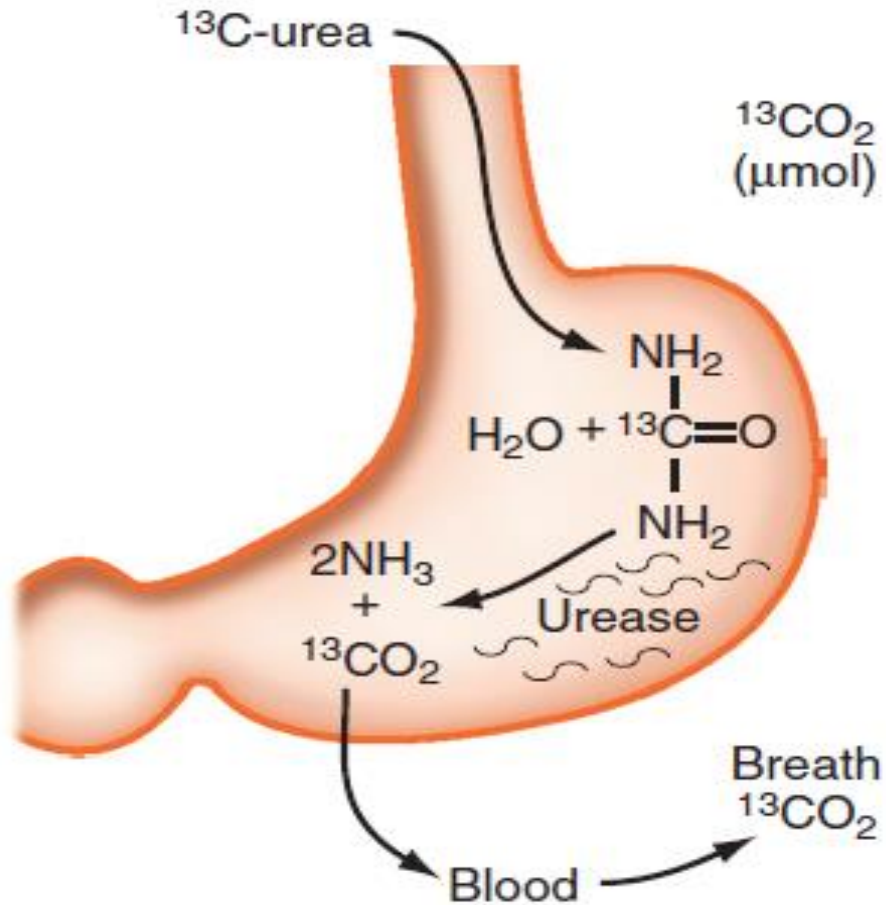
- Widely available
- Inexpensive
- Good NPV

Disadvantages

- Poor PPV if Hp prevalence is low
- Not useful after treatment

Guidelines recommend that serologic testing should not be used in low prevalence populations as the low accuracy of serology would result in inappropriate treatment in significant numbers of patients

Urea breath testing



(non-radioactive ^{13}C or radioactive ^{14}C)

Urea Breath Test

Advantages

- Identifies active infection
- Accuracy (PPV, NPV) not affected by Hp prevalence
- Useful both before and after treatment

Disadvantages

- Availability and reimbursement inconsistent
- Accuracy affected by PPI and antibiotic use
- Small radiation dose with ¹⁴C test

¹³C test is preferred in young children and pregnant women

UBT is not accurate in patients who have had gastric resective surgery.

Stool Antigen Test

Advantages

- Identifies active infection
- Accuracy (PPV, NPV) not affected by Hp prevalence
- Useful both before and after treatment (monoclonal test)

Disadvantages

- Fewer data available for polyclonal test
- Accuracy affected by PPI and antibiotic use

Accuracy can be negatively affected by

- Blood in the stomach
- Recent use of certain medications such as
 1. Antibiotics,
 2. Bismuth containing compounds,
 3. PPIs.



Endoscopic testing

Histology

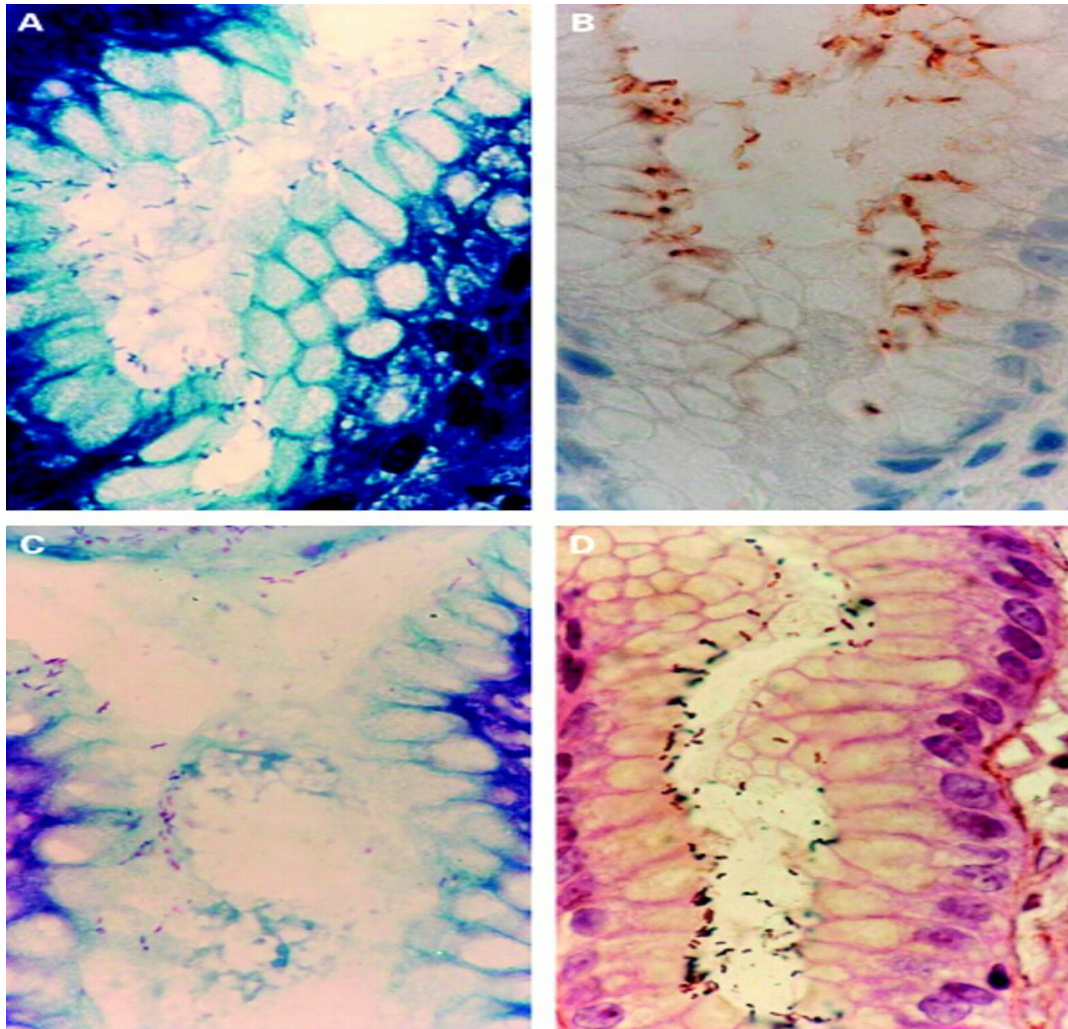
Advantages

- Excellent sensitivity and specificity, especially with special and immune stains
- Provides additional information about gastric mucosa
- Asses premalignant lesions

Disadvantages

- Expensive (endoscopy and Pathology costs)
- Some inter observer variability
- Accuracy affected by PPI and antibiotic use

Demonstration of Helicobacter pylori by the four staining methods: (A) modified Giemsa, (B) anti-H pylori antibody immunostain, (C) modified McMullen's method, (D) H pylori silver staining (HpSS) method.



O Rotimi et al. J Clin Pathol 2000;53:756-759

Rapid Urease Test

Advantages

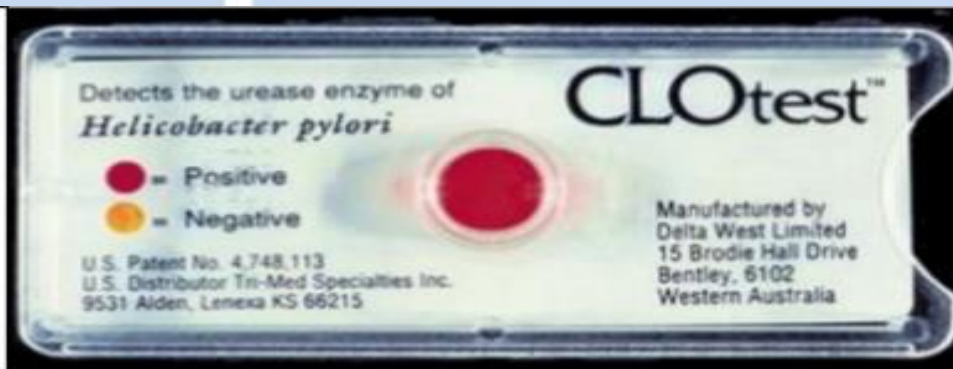
- Rapid results
- Accurate in patients not using PPIs or antibiotics
- No added Pathology cost

Disadvantages

- Requires endoscopy
- Less accurate after treatment or in patients using PPIs

Available RUT kits

CLO test
HpFast
HUT-test
Pronto Dry
Pyloritek



Gastric biopsy specimens are placed in a medium that contains urea and a Ph reagent. Urease cleaves urea to liberate ammonia, producing an alkaline pH and a resultant color change.

Cultures

Advantages

- Specificity \approx 100%
- Allows antibiotic sensitivity testing

Disadvantages

- Requires endoscopy
- Less accurate after treatment or in patients using PPIs

Biopsies for culture should be obtained before the forceps are contaminated with formalin. The tissue should be placed into a container with a few drops of saline

Medications that should be discontinued prior to testing

- ▶ PPI use within one to two weeks
- ▶ bismuth/antibiotic use within four weeks)

Endoscopic mucosal tissue sampling

H pylori Infection*

Urease test

1-2 biopsies: 5 cm proximal to the pylorus on the lesser curvature near the angularis or on the greater curve opposite the angularis

A negative urease test result should be confirmed with further testing for *H pylori*

Histologic diagnosis


2 approaches:

3 biopsies: 1 from the angulus corpus-antrum junction, 1 from the greater curvature of the corpus, 1 from the greater curvature of the antrum

or

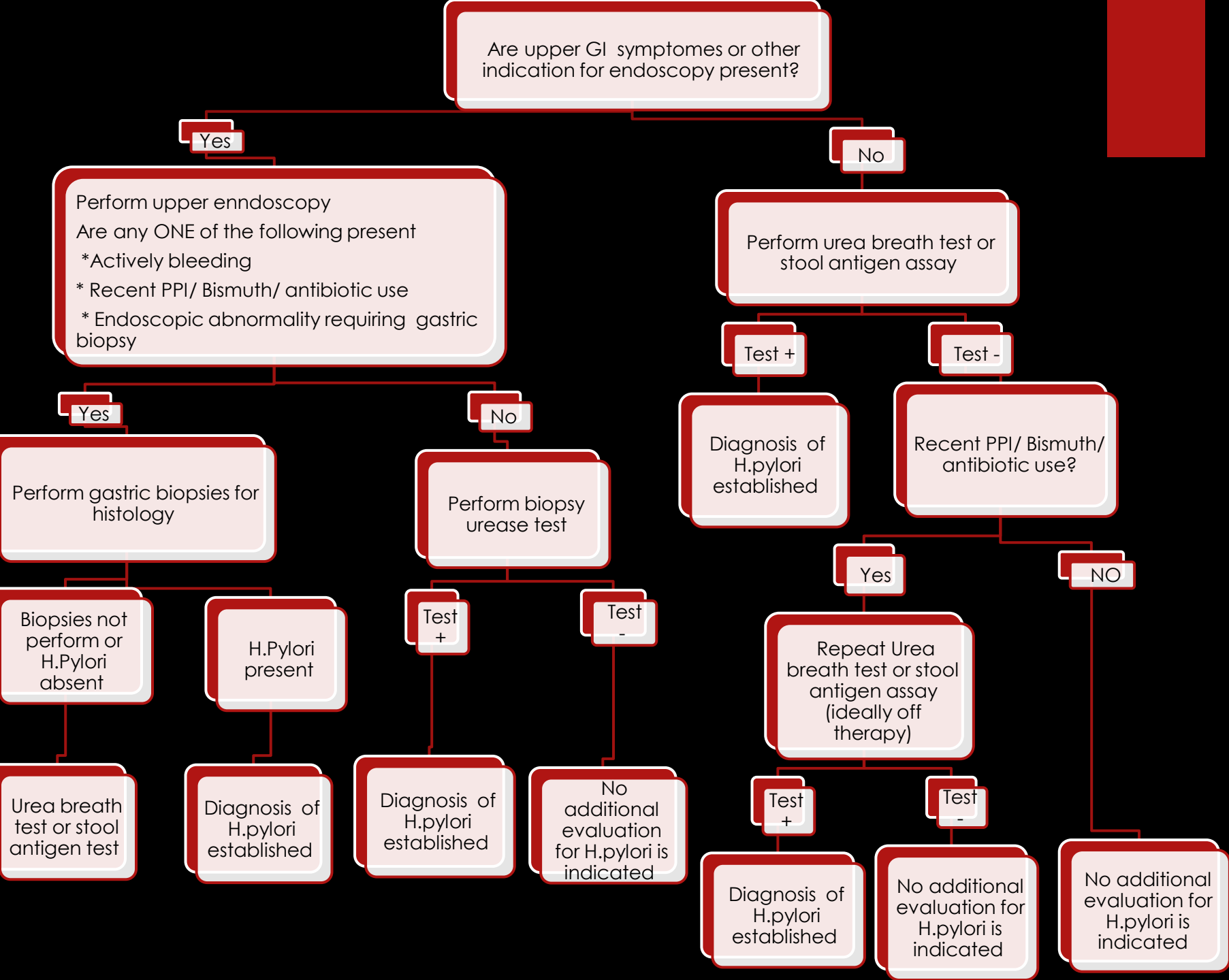
Updated Sydney Protocol

5 biopsies: 1 from antrum the 2-3 cm from the pylorus lesser curvature, 1 from the antrum 2-3 cm from the pylorus greater curvature, 1 from the corpus 8 cm from the cardia lesser curvature, 1 from the corpus 8 cm from the cardia greater curvature, 1 from the angularis

- 
- ▶ False-negative in rapid urease test results can occur in patients with UGB and ppi
 - ▶ In such patients it is recommended that samples be taken from the both the gastric antrum and the fundus to increase the sensitivity of the test
 - ▶ Increasing the number of gastric biopsy specimens from one to four also increases the sensitivity of the test

1-Weston AP, Campbell DR, Hassanein RS, et al. Prospective, multivariate evaluation of CLOtest performance. Am J Gastroenterol 1997; 92:1310.

2-Siddique I, Al-Mekhaizeem K, Alateeqi N, et al. Diagnosis of Helicobacter pylori: improving the sensitivity of CLOtest by increasing the number of gastric antral biopsies. J Clin Gastroenterol 2008; 42:356.



Are upper GI symptoms or other indication for endoscopy present?

Yes

Perform upper endoscopy
Are any ONE of the following present
* Actively bleeding
* Recent PPI/ Bismuth/ antibiotic use
* Endoscopic abnormality requiring gastric biopsy

Yes

Perform gastric biopsies for histology

No

Perform biopsy urease test

Biopsies not perform or H.Pylori absent

Urea breath test or stool antigen test

H.Pylori present

Diagnosis of H.pylori established

Test +

Diagnosis of H.pylori established

Test -

No additional evaluation for H.pylori is indicated

No

Perform urea breath test or stool antigen assay

Test +

Diagnosis of H.pylori established

Test -

Recent PPI/ Bismuth/ antibiotic use?

Yes

Repeat Urea breath test or stool antigen assay (ideally off therapy)

NO

No additional evaluation for H.pylori is indicated

Test +

Diagnosis of H.pylori established

Test -

No additional evaluation for H.pylori is indicated

THANK YOU