



### About *H. pylori*

*H. pylori* is a spiral-shaped, gram-negative bacterium found in the stomach. The bacteria can penetrate the stomach's protective mucous lining, where it produces substances that weaken the lining and make the stomach more susceptible to damage from gastric acids.

The bacteria can attach to cells of the stomach, causing gastritis, and stimulate the production of excess stomach acid. Over time, *H. pylori* can increase the risk of developing stomach cancer.

*H. pylori*-associated syndromes include peptic ulcer disease, dyspepsia, nonulcer dyspepsia, gastric adenocarcinoma, and mucosa-associated lymphoid tissue (MALT)-type lymphoma.

### *H. pylori* Epidemiology

Approximately half of the world's population is infected with the *H. pylori* bacterium, but the prevalence of *H. pylori* is not consistent across the globe. In North America, Western Europe, and Australia, *H. pylori* rates range between 20 and 40 percent. However, *H. pylori* infection rates in the underdeveloped countries, including South America and Africa, are as high as 80 to 90 percent. Most people with *H. pylori* do not develop clinical symptoms.



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# HELICOBACTER PYLORI

*H. pylori* testing



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## Diagnostic *H. pylori* Tests

There are various diagnostic tests available for the detection of *H. pylori*. They can be divided into two broad categories: invasive tests that require esophagogastro-duodenoscopy (EGD) and noninvasive tests that do not require EGD. The most common invasive test is an endoscopy with antral biopsy.

Invasive testing is recommended for adults >55 years of age who exhibit alarm symptoms, including but not limited to gastrointestinal bleeding, unexplained iron-deficiency anemia, unexplained weight loss, and a family history of upper gastrointestinal cancer.

Noninvasive testing—urea breath test and stool antigen—are recommended for adults <55 years of age who do not have alarm symptoms.

## Noninvasive *H. pylori* Testing

### Recommended: urea breath and stool antigen testing

Only the urea breath tests and the stool antigen test are recommended in test and treatment guidelines. Both detect active *H. pylori* infection and can be used to monitor treatment. Both have high sensitivity and specificity (see table). Even though patient preparation is involved with both of these test methods, they are the recommended noninvasive methods for *H. pylori* testing.

### Not recommended: serological testing

Even though it is not recommended in test and treatment guidelines for detecting and monitoring active *H. pylori* infections, serological testing has remained the test of choice for many physicians.

Conventional wisdom held that when negative, serological testing provided strong evidence against infection. However, the relative insensitivity of *H. pylori* serology has called this belief into question.

The major underlying concern with *H. pylori* serological testing is that IgG is often the most frequently ordered assay. However, positive IgG serological results do not provide a diagnosis of current infection, since the patient could have been exposed or previously infected.

Positive IgG results in a patient may thus lead to unnecessary therapy.

Testing for IgM is of limited benefit, since most symptoms associated with *H. pylori* are attributable to the chronic inflammatory process, and the IgM subclass of immunoglobulin is usually absent in a true infection.

IgA testing has been used in conjunction with IgG testing in the hope that a positive test would provide evidence of active infection. However, the results of these serologic tests do not correlate with stool antigen testing results. In addition, this test is not valid in IgA-deficient individuals.

Recent guidelines for testing strategies issued by the American Gastroenterology Association and American College of Gastroenterology do not recommend the use of

serology for the diagnosis of active *H. pylori* infection. For these reasons, serological testing for *H. pylori* has been discontinued at ARUP Laboratories to facilitate physician use of the recommended test methods only.

## References

Couturier, MR. The evolving challenges of *Helicobacter pylori* disease, diagnostics, and treatment, part I. *Clin Microbiol* 2013;35(3):19–24.

Couturier, MR. The evolving challenges of *Helicobacter pylori* disease, diagnostics, and treatment, part II. *Clin Microbiol* 2013;35(4):27–30.

## Noninvasive *H. pylori* Testing Comparison

	Breath <i>Helicobacter pylori</i> Breath Test, Adult (ARUP test code 2010476)	Stool <i>Helicobacter pylori</i> Antigen, Fecal by EIA (ARUP test code 0065147)	Serology Testing no longer available at ARUP (antibody IgA, IgG & IgM)
<b>Indications</b>	<ul style="list-style-type: none"> <li>• May be used to document test-of-cure</li> <li>• Identifies active <i>H. pylori</i> infection</li> </ul>	<ul style="list-style-type: none"> <li>• May be used to document test-of-cure</li> <li>• Identifies active <i>H. pylori</i> infection</li> </ul>	<ul style="list-style-type: none"> <li>• Not recommended for <i>H. pylori</i> diagnosis</li> <li>• Not effective for test-of-cure</li> <li>• Likely will not identify active <i>H. pylori</i> infection</li> </ul>
<b>Patient Preparation</b>	<ul style="list-style-type: none"> <li>• No proton-pump inhibitors (PPIs) or antibiotics for two weeks prior to testing</li> <li>• No bismuth-containing preparations for two weeks</li> </ul>	<ul style="list-style-type: none"> <li>• No PPIs for two weeks prior to testing</li> <li>• No antibiotics for four weeks prior to testing</li> </ul>	<ul style="list-style-type: none"> <li>• No patient preparation required.</li> <li>• <b>No longer available at major laboratories.</b></li> </ul>
<b>Sensitivity and Specificity</b>	Sensitivity: 90–98% Specificity: 92–100%	Sensitivity: 94.70% Specificity: 96.10%	Sensitivity: 80–85% Specificity: 75–80%
<b>Advantages</b>	<ul style="list-style-type: none"> <li>• Recommended in test and treatment guidelines</li> <li>• Detects active infection</li> <li>• Can be used to monitor treatment</li> <li>• Strong positive predictive value for <i>H. pylori</i></li> <li>• FDA-cleared for pediatric use</li> </ul>	<ul style="list-style-type: none"> <li>• Recommended in test and treatment guidelines</li> <li>• Detects active infection</li> <li>• Can be used to monitor treatment</li> <li>• Easy to store and transport specimen</li> </ul>	<ul style="list-style-type: none"> <li>• Not affected by PPI or antibiotic use</li> <li>• Convenient clinic-collected specimen</li> <li>• Costs less</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>• Complex specimen collection and transport</li> <li>• Requires patient preparation ahead of testing</li> <li>• PPI or antibiotic use decreases sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>• PPI or antibiotic use decreases sensitivity</li> <li>• Possible stigma associated with stool collection for some patients</li> </ul>	<ul style="list-style-type: none"> <li>• Cannot distinguish between active and past infections</li> <li>• Not recommended in test and treatment guidelines</li> <li>• Suboptimal test characteristics</li> </ul>