

# H. pylori: Does it have a silver lining?

*The bacterium is a leading cause of ulcers, but it might have health benefits, too.*

**T**he latest Nobel Prize in medicine—for discovering the ulcer-causing stomach bug *Helicobacter pylori* (*H. pylori*)—honored a triumph of scientific inquiry. But it also speaks to the uncertainties and complications of scientific inquiry.

In the 1980s, Australian researchers J. Robin Warren and Barry J. Marshall proved that the curvy bacterium caused inflammation in the stomach (gastritis) and ulcers in the stomach and upper part of the small intestine (duodenum). Marshall famously drank a glass of the bug to help make the case. When the pair announced their findings, they were, in effect, laughed off the lectern. Everyone then believed that stress was the main cause of ulcers, and that bacteria couldn't survive the stomach's acid environment. But the researchers persevered; the tide turned; and the medical community recognized their findings.

Around the world, *H. pylori* is the major cause of ulcers in the stomach and duodenum. When Marshall discovered that the bacterium produces the enzyme urease (pronounced YOUR-ē-ace), he developed a urea breath test for the infection. The test is simple, noninvasive, and accurate, and remains a common way of diagnosing the infection, along with blood and stool tests. Once diagnosed, patients can be treated with new antibiotic therapies that eliminate the bacteria.

*H. pylori* isn't the only cause of ulcers. Nonsteroidal anti-inflammatory drugs (NSAIDs) like aspirin, ibuprofen (Motrin, other brands), and naproxen (Aleve, other brands) are the second leading cause in developed countries. Alcohol and smoking are risk factors.

Other culprits include gastrointestinal illnesses like Crohn's disease (an inflammatory bowel condition) and Zollinger-Ellison syndrome (a tumor of the pancreas and upper part of the small intestine that increases stomach acid production).

## Stamp it out?

No one is advocating eradication of *H. pylori*, and infections aren't treated unless they are causing problems for the patient. Roughly 40%–50% of the world's population is infected with the bug, although it's much less in many industrialized nations, probably because of improved hygiene and antibiotics. As a result, *H. pylori* is responsible for a smaller proportion of ulcers in the United States and many other countries. It is often a rather unobtrusive guest, causing no symptoms and doing no harm. Only 10%–15% of infections lead to ulcers.

Eradication would also exacerbate the problem of antibiotic resistance. Clinicians have already encountered *H. pylori* strains that aren't fazed by "triple therapy," the current first-line treatment, which combines two antibiotics—commonly amoxicillin and clarithromycin—with omeprazole (Prilosec) or a similar drug to counter stomach acid.

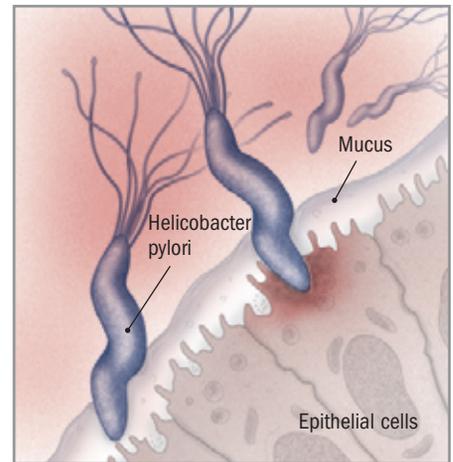
By 2001, European researchers were reporting a 10% rate of *H. pylori* resistance to clarithromycin. Studies in Austria and Japan have shown the prevalence of resistant strains doubling in just two to four years.

## So what's the up side?

Strangely, some research suggests that *H. pylori* may actually do some good.

**NSAID-related ulcers.** The prevailing view is that *H. pylori* increases the risk of developing an ulcer from NSAIDs. But Polish researchers have found quite the opposite—that infection may limit the damage done by NSAIDs. The gastric response to *H. pylori* is varied, so it's conceivable that the bacterium protects some stomachs, but not others.

**GERD.** Some experts contend that *H. pylori* could lessen the damage from gastroesophageal reflux disease (GERD), the regurgitation of stomach contents into the esophagus and an important risk factor for esophageal cancer. *H. pylori* survives, in part, by



**They can stomach it:** *Helicobacter pylori* bacteria infect the lower stomach (antrum), causing peptic ulcer disease.

producing urease, which breaks down into ammonia, a compound that helps neutralize stomach acid.

A 2003 study in the journal *Gut* showed a 14% increase in patients' stomach acid after *H. pylori* eradication, which is perhaps enough to worsen esophageal damage.

**Obesity.** The same researchers linked the falling rate of *H. pylori* infection to our current obesity crisis. They focused on ghrelin (GRELL-in), a peptide in the stomach that helps increase appetite and food consumption. It turns out that eliminating *H. pylori* boosts ghrelin levels by 75%.

It's not surprising that *H. pylori* may have some benefits. Its worldwide prevalence and specialized adaptations suggest that it "co-evolved" with humans over a great span of time. It makes sense that the relationship could feature some symbiotic elements. In discussing "microflora"—microorganisms that view us as prime real estate—it's tempting to distinguish "good bugs" from "bad bugs." But with microorganisms, you can't always tell the white hats from the black. "In a world of black and white," researcher Martin J. Blaser has observed, "*Helicobacter pylori* is gray." And recognizing that complexity is also a part of scientific inquiry. ♥

Source: from Harvard Health Letter, Harvard Health Publications, Copyright 2006 by President and Fellows of Harvard College. All rights reserved.

Harvard authorizes you to view or download a single copy of the Harvard Content on EBSCOhost solely for your personal, noncommercial use if you include the following copyright notice: "Copyright, President and Fellows of Harvard College. All rights reserved" and other copyright and proprietary rights notices which were contained in the Harvard Content. Reproduction and/or redistribution of the Harvard Content is expressly prohibited. Any special rules for the use of other items provided on EBSCOhost may be included elsewhere within the site and are incorporated into these Terms and Conditions.

The Harvard Content is protected by copyright under both United States and foreign laws. Title to the Harvard Content remains with President and Fellows, Harvard College. Any use of the Harvard Content not expressly permitted by these Terms and Conditions is a breach of these Terms and Conditions and may violate copyright, trademark, and other laws. Harvard Content and features are subject to change or termination without notice in the editorial discretion of Harvard. All rights not expressly granted herein are reserved to President and Fellows, Harvard College.

If you violate any of these Terms and Conditions, your permission to use the Harvard Content automatically terminates and you must immediately destroy any copies you have made of any portion of the Harvard Content.

#### **MEDICAL DISCLAIMER**

The information contained in this online site is intended to provide accurate and helpful health information for the general public. It is made available with the understanding that the author and publisher are not engaged in rendering medical, health, psychological, or any other kind of personal professional services on this site. The information should not be considered complete and does not cover all diseases, ailments, physical conditions or their treatment. It should not be used in place of a call or visit to a medical, health or other competent professional, who should be consulted before adopting any of the suggestions in this site or drawing inferences from it.

The information about drugs contained on this site is general in nature. It does not cover all possible uses, actions, precautions, side effects, or interactions of the medicines mentioned, nor is the information intended as medical advice for individual problems or for making an evaluation as to the risks and benefits of taking a particular drug.

The operator(s) of this site and the publisher specifically disclaim all responsibility for any liability, loss or risk, personal or otherwise, which is incurred as a consequence, directly or indirectly, of the use and application of any of the material on this site.