

# Internet Research - Case Study: Peptic Ulcer

## Peptic Ulcer

### Case Presentation

Harold, a fifty-eight year old grocery store manager, had recently been waking up in the middle of the night with abdominal pain. This was happening several nights a week. He was also experiencing occasional discomfort in the middle of the afternoon. Harold decided to schedule an appointment with his physician.

The doctor listened as Harold described his symptoms and then asked Harold some questions. He noted that Harold's appetite had suffered as a result of the pain he was experiencing and as a result of the fear that what he was eating may be responsible for the pain. Otherwise, Harold seemed fine.

The doctor referred Harold to a physician that specialized in internal medicine and had Harold make an appointment for a procedure called an endoscopy. The endoscopy was performed at a hospital later that week. During the procedure, a long, thin tube was inserted into Harold's mouth and directed into his digestive tract. The end of the tube was equipped with a light source and a small camera which allowed the doctor to observe the interior of Harold's stomach. The endoscope was also equipped with a small claw-like structure that the doctor could use in order to obtain a small tissue sample from the lining of Harold's stomach, if required.

The endoscopy revealed that Harold had a peptic ulcer. Analysis of a tissue sample taken from the site showed that Harold also had an infection that was caused by *Helicobacter pylori* bacteria. The doctor who performed the endoscopy gave Harold prescriptions for two different antibiotics and a medication that would decrease the secretion of stomach acid. The doctor also instructed Harold to schedule an appointment for another endoscopy procedure in 6 months.

### Case Background

A peptic ulcer is a sore that occurs in the lining of a part of the gastrointestinal tract that is exposed to pepsin and acid secretions. Most peptic ulcers occur in the lining of the stomach or duodenum. 90% of all duodenal ulcers and 80% of all gastric ulcers are caused by *H. pylori* infection. Most of the remaining peptic ulcers are caused by long-term usage of certain anti-inflammatory medications like aspirin.

There is still some question as to how *H. pylori* is spread. However, *H. pylori* has been identified in the saliva of infected individuals and may be spread via this fluid. *H. pylori* bacteria have the ability to survive the acid environment in the stomach because they produce enzymes that neutralize stomach acids. They also have the ability to move through the mucous membrane lining the stomach or duodenum and take up residence in the underlying connective tissue. The damage to the mucous membrane that results from a *H. pylori* infection allows pepsin and hydrochloric acid to further damage the wall of the stomach or duodenum. The sore that results is the peptic ulcer.

Describe the functions of the following components of gastric juice.

1. Hydrochloric acid
2. Pepsinogen
3. Pepsin
4. Intrinsic factor
5. Why don't the components of gastric juice damage the wall of the stomach in the absence of a *H. pylori* infection?
6. Why don't most other types of bacteria produce ulcers?