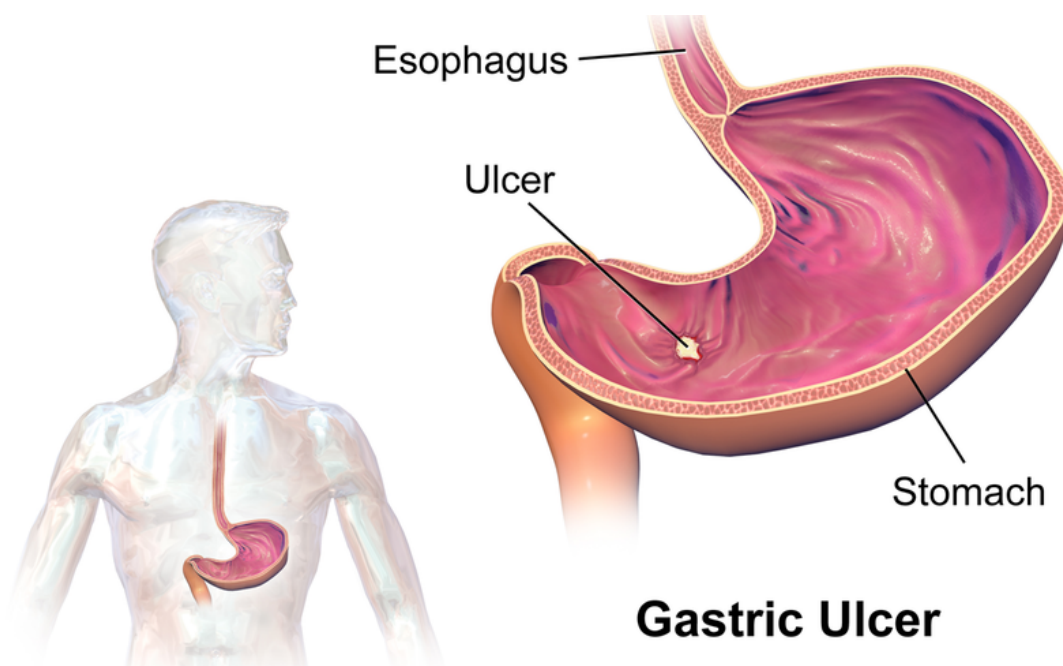


## Stomach Ulcer (Peptic Ulcer) — Symptoms and Treatment

[See online here](#)

**Approximately 10% of the US population experience peptic ulcer disease, which has significantly impacted the health care system; both men and women appear to be affected equally with the condition. Peptic ulcer disease may lead to several complications, including an upper gastrointestinal hemorrhage.**



### Definition and Background of Peptic Ulcer

Open sores are called ulcers, and the word peptic means that acid is the cause of the ulcer. **Gastric** and **duodenal** ulcers are the two most common types of peptic ulcers. The difference between the two types is in the **location** of the ulcer. Duodenal ulcers are found in the duodenum, and gastric ulcers are located in the [stomach](#).

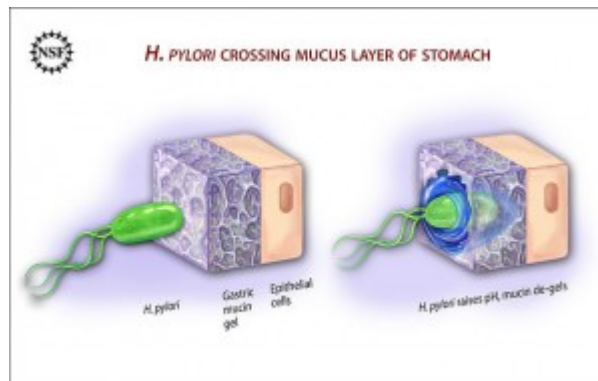
### Pathophysiology of Peptic Ulcer

There is a physiologic balance in normal conditions between **gastroduodenal mucosal defense** and **gastric acid secretion**. When this balance between the defensive mechanisms and the aggressive factors gets disrupted, mucosal injury occurs, which results in the developing of peptic ulcer. These aggressive factors include **H. pylori infection, NSAIDs, alcohol, smoking, acid, bile salts and pepsin**.

# Etiology of Peptic Ulcer

## H. pylori infection

[H. pylori infection](#) is considered as **one of the most common causes** of peptic ulcer disease. The prevalence of H. pylori in complicated ulcers is less than that in uncomplicated ulcers.



## Drugs

The use of **nonsteroidal anti-inflammatory drugs (NSAID)** is a common cause for the developing of peptic ulcer disease. They render the mucosa vulnerable to injury by disrupting the mucosal permeability barrier. Other risk factors, when accompanied with NSAID use, increase the risk of developing peptic ulcers; these factors include **advanced age, female sex, history of a previous peptic ulcer, long-term use or high doses of NSAID and severe comorbid diseases.**

## Lifestyle factors

Smoking **tobacco** and **drinking alcohol** appear to increase the risk of developing peptic ulcer disease. There is not enough evidence that the use of caffeine increases the risk of developing ulcers.

## Severe physiologic stress

Several stressful conditions may cause peptic ulcers such as **CNS trauma, surgery, burns, severe medical illness, sepsis, hypotension, multiple traumatic injuries, and respiratory failure.**

## Hypersecretory states

Several hypersecretory states may cause peptic ulcers including:

- Systemic mastocytosis
- Basophilic leukemias
- Short bowel syndrome
- Gastrinoma
- [Hyperparathyroidism](#)
- [Cystic fibrosis](#)

## Genetic factors

Approximately **20% of peptic ulcer disease patients have a family history of the disease.** Studies have also shown a weak **association between blood type O** and the

development of duodenal ulcers.

## Epidemiology of Peptic Ulcer

Approximately **4.5 million** people are affected with peptic ulcer disease every year in the United States with nearly **10%** of the US population showing evidence of a duodenal ulcer at some time in their lives.

The frequency of peptic ulcer disease in other countries is variable and is determined by the association with the major risk factors of the condition, such as **NSAID** use and **H. pylori infections**.

## Presentation of a Peptic Ulcer

Obtaining a thorough medical history is essential in the diagnosis of peptic ulcer disease; however, **history alone is not enough** to reach a definite diagnosis.

## Symptoms of peptic ulcer

The most common symptom of both duodenal and gastric ulcers is an **epigastric pain**, which is characterized by a **burning sensation** occurring **after meals**. In gastric ulcers, the pain usually starts **shortly after meals**; whereas, it may take a few hours to start in duodenal ulcers. Unlike duodenal ulcers, **the pain caused by gastric ulcers cannot be relieved by antacids**.

Other symptoms and manifestations include:

- Heartburn
- Chest discomfort
- Dyspepsia
- Hematemesis
- Fatigue
- [Dyspnea](#)
- Hematochezia may present in rare cases of bleeding ulcers
- Peptic ulcer disease may be asymptomatic, especially in elderly patients

Alarm features that require referral to a gastroenterologist and further workup include:

- Unexplained weight loss
- Recurrent vomiting
- Family history of GI cancer
- Progressive dysphagia or odynophagia
- [Anemia](#) or bleeding
- Early satiety

## Physical examination signs of a peptic ulcer

The physical findings in uncomplicated peptic ulcer disease are **nonspecific**, and they include:

- **Mild epigastric tenderness**
- Melena, which results from acute or subacute GI bleeding
- Succussion splash resulting from complete or partial gastric obstruction
- Occult blood loss results in guaiac-positive stool

If the peptic ulcer perforates, patients will suffer from a **sudden, severe sharp abdominal pain**. Generalized and rebound tenderness, as well as guarding and rigidity, will be revealed by physical examination.

## Classification of a Peptic Ulcer

The **Johnson classification** categorizes gastric ulcers into **four types**:

### Type I

Type I gastric ulcers are located on the **lesser curvature** near the **angularis incisura**, which is close to the border between the body of the stomach and the antrum. Acid secretion is usually **normal or decreased** in patients suffering from type I gastric ulcers.

### Type II

They are a **combination of duodenal and stomach ulcers**. Acid secretion is **increased** in these types of ulcers.

### Type III

These ulcers are **prepyloric**. Acid secretion in type III ulcers could be **normal or increased**.

### Type IV

Ulcers in this type are usually located near the **gastroesophageal junction**. The acid secreted is either **normal or decreased** in this type.

## Differential Diagnoses of Peptic Ulcer Disease

- [Crohn's disease](#)
- [Zollinger-Ellison syndrome](#)
- [Acute gastritis](#)
- [Acute coronary syndrome](#)
- Cholecystitis
- Acute cholangitis
- [Diverticulitis](#)
- Chronic gastritis
- Esophagitis
- Esophageal rupture
- [Gallstones](#)
- [Gastroesophageal reflux diseases](#)
- Viral hepatitis
- [Inflammatory bowel disease](#)

## Diagnosis of Peptic Ulcer Disease

### H. pylori testing

H. pylori infection is one of the most common causes of peptic ulcer disease. Thus, it is important to test for it. Usually, **routine laboratory tests are not helpful**; **endoscopic and radiographic** confirmation is required for the documentation of peptic ulcer disease.

## Endoscopy

The **preferred diagnostic test** in the evaluation of suspected peptic ulcer patients is upper GI endoscopy. It is **highly sensitive**, helps in the detection of *H. pylori* infection, and aids in the differentiation between benign and malignant lesions through biopsies.

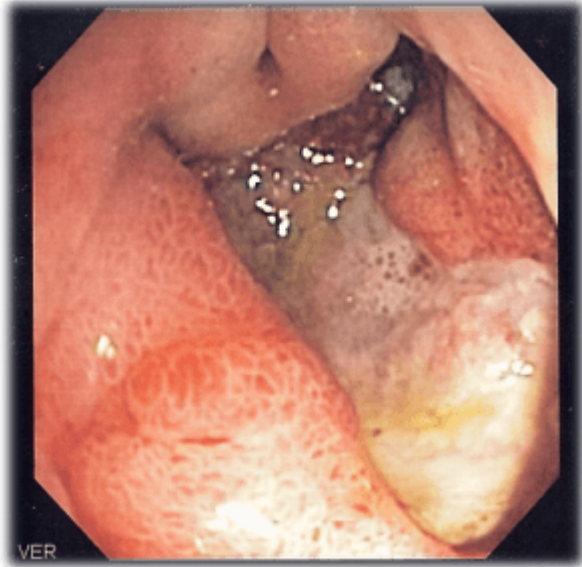


Image: "Endoscopic image of deep gastric ulcer in the gastric antrum" by Samir. License: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

## Radiography

**Chest radiographs** are used to look for abdominal air to detect **ulcer perforation**.

## Angiography

Patients with massive GI bleeding, who cannot undergo endoscopy, may benefit from angiography, which helps in **identifying the source of bleeding and providing the needed therapy**.

## Serum gastrin level

Screening for **Zollinger-Ellison syndrome** is performed by a fasting serum gastrin level.

## Secretin stimulation test

If the serum gastrin level test was not enough to make the diagnosis of Zollinger-Ellison syndrome, a secretin stimulation test may be used, which **distinguishes Zollinger-Ellison syndrome from other conditions**.

## Biopsy

A biopsy is taken to examine for gastric cancer, which has a **70% accuracy**. The **sensitivity increases to 99%** when seven biopsy samples are obtained from the base and ulcer margins.

## Histologic findings

**Slough and inflammatory debris** cover the surface of the ulcer. Active granulation with fibrinoid necrosis and mononuclear leukocytic infiltration may be seen beneath the neutrophilic infiltration. The mucosa and submucosa are usually infiltrated by **plasma cells, monocytes, and lymphocytes** in chronic superficial gastritis.

## The Management of Peptic Ulcers

The management of peptic ulcers differs depending on the **clinical presentation**, as well as the **etiology** of the condition.

### Emergency department cares in peptic ulcer

In the emergency department, the presentations of gastritis and peptic ulcer disease are indistinguishable, which makes the management of them the same. **Relieving the discomfort** and **promoting healing** by the protection of the gastric mucosal barrier are the main treatment goals in the management of acute conditions. **Acute interventions are usually not needed** in peptic ulcer disease or gastritis.

### H. pylori infection

H. pylori infections are treated with **triple therapy** including **amoxicillin, clarithromycin**, and a **PPI for 7 to 14 days**. In patients who are allergic to penicillin, amoxicillin is replaced with **metronidazole**. It is recommended to extend the duration of the treatment for more than 14 days in complicated cases of H. pylori infections.

### Medical management of NSAID ulcers

It is advised to **discontinue** the use of NSAID in patients who are diagnosed with peptic ulcer disease.

### Bleeding peptic ulcers

A bleeding ulcer can be evaluated and managed by **endoscopy**, which reduces the likelihood of recurrent bleeding and decreases the need for surgical intervention.

The general pharmacologic principle of the medical management of acute bleeding from a peptic ulcer is **acid suppression**.

## Review Questions

The answers are below the references.

**1. A 51-year-old Caucasian man presented to the doctor's office complaining of a black tarry stool. The development of carcinoma in this patient is least associated with which of the following causes?**

- A. Adenomatous polyp
- B. Duodenal ulcer
- C. Barrett's esophagus
- D. H. pylori infections
- E. Gastric ulcer

**2. A 32-year-old Nigerian woman presents to your office complaining of burning pain in her epigastric region. An ulcer in the proximal duodenum was demonstrated by esophagoduodenoscopy. The cause of this patient's ulcer is best addressed by which of the following treatments?**

- A. Surgical resection
- B. Omeprazole
- C. Antibiotics
- D. NSAID use cessation
- E. Cimetidine

**3. A 33-year-old Caucasian man presented to your office complaining of symptoms suggestive of peptic ulcer disease. You decide to perform a biopsy because you suspect H. pylori infection. Which site of the stomach (based on the figure on the right) corresponds to the likely location of the bacterium?**

- A. Lower esophageal sphincter
- B. Pyloric sphincter
- C. Antrum of the stomach
- D. Cardia
- E. Fundus

## References

[Peptic Ulcer Disease](#) via [emedicine.medscape.com](http://emedicine.medscape.com)

**Correct answers:** 1B, 2C, 3C

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Notes