Peptic Ulcer Disease

What We Know

› Peptic ulcer disease (PUD) is characterized by erosion of the mucosal lining of the stomach or duodenum that occurs secondary to an imbalance between mucosal protective factors (e.g., mucus production, epithelial renewal) and mucosal damaging factors (e.g., *Helicobacter pylori* infection, nonsteroidal anti-inflammatory drugs [NSAIDs]). PUD results in a gastric ulcer when erosion develops in the lining of the stomach and in a duodenal ulcer when erosion develops in the lining of the duodenum. PUD is one of the most common disorders of the gastrointestinal (GI) system and is the most common cause of upper GI bleeding and perforation(2,3,4)

• PUD affects ~ 4.5 million persons in the United States each year. The condition occurs without gender predilection, but is more common in individuals of older age(2)
  – Risk factors include personal or family history of PUD; use of NSAIDs, corticosteroids, bisphosphonates, chemotherapy drugs, or potassium chloride supplements; cigarette smoking; obesity; severe physiologic stress (e.g., due to burns, CNS trauma, surgery, or severe medical illness); and Zollinger-Ellison syndrome (ZES; i.e., a rare disorder characterized by gastric acid-producing tumors)(2,4)
- Researchers who surveyed 47,609 persons in 17 countries found significant correlation between a number of mental health disorders—including major depressive episode/dysthymia, bipolar disorder, panic disorder, generalized anxiety disorder, social phobia, specific phobia, post-traumatic stress disorder, obsessive-compulsive disorder, intermittent explosive disorder, binge-eating disorder, alcohol abuse, alcohol dependence, drug abuse, and drug dependence—and the development of PUD. Risk of developing PUD increased in a dose-response fashion with the number of lifetime mental health disorders(9)

• Signs and symptoms of PUD are often nonspecific and vary slightly depending on the location of the ulcer. Signs and symptoms include a gnawing or burning sensation in the epigastric area that occurs after fasting in cases of a duodenal ulcer or soon after eating in cases of a gastric ulcer, nausea, vomiting (sometimes of blood), melena (i.e., dark, tarry feces containing blood), poor appetite, and chest pain (rare)(2,3,4)
  – Signs and symptoms can be atypical in older patients, who are more likely than younger patients to be asymptomatic(2,6)
  – Manifestations that should prompt immediate referral to a GI specialist clinician include bleeding, anemia, early satiety, unexplained weight loss, progressive dysphagia, and family history of GI cancer(2)

• Untreated PUD can lead to bleeding, gastric outlet obstruction, intestinal obstruction or perforation, and death. Risk for severe complications is compounded by the fact that most persons with PUD are asymptomatic in up to 40% of cases and can remain so until perforation or hemorrhage occurs(2,4)
  – Approximately 1–2% of patients with PUD experience complications each year(2)
  – The mortality rate for PUD is 1 death per 100,000 cases(2)

› *Helicobacter pylori* infection and NSAID use are the most common causes of PUD(2,4,6)
• *H. pylori* infection is identified in more than 70% of patients with PUD. The bacterium colonizes the deep layers of the mucosal gel that coats the gastric mucosa and produces a toxin that promotes upper GI mucosal inflammation and ulceration\(^2\,^4\).

– *H. pylori* is found in up to 90% of persons in certain geographic areas, but most persons who are infected do not develop PUD\(^4\).

• Chronic use of NSAIDs such as aspirin and ibuprofen can cause PUD by disrupting the mucosal barrier, which results in increased susceptibility to mucosal injury\(^2\,^6\).

– Chronic use of NSAIDs is the second most common cause of PUD and is most often associated with gastric ulcer\(^2\).

  - Risk factors for NSAID related peptic ulcers include older age, history of PUD, concomitant corticosteroid and/or anticoagulation therapy, high doses of NSAIDs, and serious systemic disorders\(^2\,^4\).

– Populations that are at the highest risk of developing NSAID-associated PUD include older adults; individuals with a history of PUD and/or *H. pylori* infection; patients concurrently receiving antiplatelet, anticoagulant, or oral corticosteroid therapy; smokers; alcoholics; and patients with severe concomitant disease\(^2\,^6\).

  - Older adults might be more susceptible to developing NSAID-associated PUD due to several factors, including age-related impairment in maintaining mucosal protective mechanisms and delayed gastric emptying, which might increase exposure of the gastric mucosa to oral medications\(^6\).

› PUD is diagnosed definitively by endoscopic examination and histologic examination of biopsied gastric mucosa tissue. Additional diagnostic studies include\(^1\,^2\,^3\,^4\):

  - upper GI barium test, which is useful in identifying up to 80% of PUD\(^4\).

  - stool antigen test, which involves enzyme-linked immunosorbent assay (ELISA) testing to identify *H. pylori* antigen in the stool, indicating an active infection\(^2\,^4\).

  - serum gastrin level to identify ZES\(^2\,^4\).

  - urea breath test, which is useful in identifying active infection with *H. pylori*. During a urea breath test, the patient ingests carbon-labeled urea which becomes hydrolyzed if *H. pylori* is present and is measured during exhalation\(^2\,^4\).

  - serology studies, which are used to assess for the presence of *H. pylori* antibodies in serum, plasma, or whole blood; serology studies indicate prior exposure to *H. pylori* but not current infection\(^2\,^4\).

› Standard treatment for PUD includes the administration of antibiotics to eradicate *H. pylori*, histamine2-receptor antagonists (H2-receptor antagonists) or proton pump inhibitors (PPIs) to suppress gastric acid production, mucosal protectants (e.g., misoprostol), and patient education regarding reducing modifiable risk factors\(^2\,^4\,^8\,^11\).

• Treatment with a PPI (e.g., omeprazole, lansoprazole) plus a 10-day course of clarithromycin and amoxicillin is effective in eradicating *H. pylori* and healing ulcers in 85–90% of patients. Eradication of *H. pylori* reduces the PUD recurrence rate from 60–90% to 10–20%\(^2\,^4\).

– The authors of a recent meta-analysis of 19 trials involving 2,117 patients found PPIs are 61% more effective in reducing the risk of clinically important GI bleeding and 52% more effective in reducing risk of overt GI bleeding, compared to H2-receptors in critically ill patients\(^1\).

– The authors of a systematic review identified 31 trials with a total of 12,532 participants and concluded that PPIs reduce risk developing a peptic ulcer by 73% and reduce risk of serious ulcer complications by 81% in persons treated with NSAIDs\(^11\).

– Cochrane reviewers found insufficient evidence to determine the relative efficacy of high-dose PPI therapy versus lower-dose PPI therapy in the treatment of bleeding ulcers\(^2\).

– Cochrane reviewers found evidence that the addition of a 1–2-week course of *H. pylori* eradication therapy to ulcer-healing drugs hastens healing of duodenal ulcers and reduces risk of recurrence of duodenal and peptic ulcers\(^5\).

– Although PPIs are generally well tolerated, potential adverse effects of long-term therapy include increased risk for enteric infections (e.g., *Clostridium difficile*-associated diarrhea), community-associated pneumonia, vitamin B12 deficiency, kidney disease, dementia, and osteoporotic-related fractures\(^2\,^5\,^7\).

– Compared with PPIs, H2-receptor antagonists appear to be associated with reduced risk of long-term adverse effects\(^6\).

• Bleeding is often treated effectively by hemoclipping (i.e., endoscopic placement of hemoclips) or by thermocoagulation (i.e., the application of heat produced by electric current)\(^2\,^3\).
• In severe cases, surgery can be necessary to treat PUD and/or its complications\(^{2,3,10}\)
  – Laparoscopic surgery appears to be comparable to open surgery for repair of perforated peptic ulcers\(^{10}\)
• Reduction of risk factors (e.g., stress, smoking, dietary triggers) is as important as pharmacologic treatment. Patient education about making dietary changes is individualized and focuses on avoiding foods that trigger signs and symptoms\(^{2,4}\)

**What We Can Do**

› Learn about PUD, including its signs and symptoms, treatment options, and prevention strategies, so you can accurately assess your patients’ personal characteristics and health education needs; share this information with your colleagues
› Educate patients that risk of exacerbating PUD can be reduced through regular use of prophylactic medication and by avoidance of dietary and behavioral triggers\(^{2,4}\)
  • Educate about the effects of smoking, caffeine, and alcohol consumption; educate to eat smaller, more frequent meals up to 6 times a day to prevent long periods when excessive acid production in an empty stomach can cause pain
  • Request referral to a registered dietitian, if appropriate, for patient evaluation, education, and assistance with making proper food choices
› Become knowledgeable about medications that can increase or decrease PUD signs and symptoms\(^{4}\)
  • Educate patients about the risks associated with the chronic use of NSAIDs, and educate about prescribed medication and when to contact the physician should adverse effects develop. Encourage patients to discuss with their treating clinician the use of alternative analgesics to replace medications that can cause or aggravate PUD
References


