GI SYSTEM | HIGH-YIELD | NCJMM ALIGNED

NGN NCLEX · 2026

Peptic Ulcer *Disease*

A break in the protective mucosal lining of the stomach or duodenum — where acid wins, tissue loses. Complications can turn urgent fast. Know the pain pattern, the bleed signs, and the priority action.

01 Definition / *Overview*

WHAT IT IS

Erosion of the GI mucosa deep enough to expose submucosal tissue to acid & pepsin.

Caused by an imbalance between **aggressive factors** (HCl, pepsin, H. pylori) and **protective factors** (mucus, bicarbonate, blood flow, prostaglandins).

#1 CAUSE
H. pylori infection

#2 CAUSE
NSAIDs · ASA · steroids

BIG RISK FACTORS
Smoking · Alcohol · Stress

Two main sites: **gastric** (stomach body) and **duodenal** (first 1–2 cm of duodenum). Duodenal ulcers are ~4× more common.

GASTRIC | DUODENAL | STRESS-RELATED

02 Pathophysiology *Simplified*

01 Mucosal barrier breakdown

02 Acid & pepsin contact exposed tissue

03 Inflammation & erosion of mucosa

04 Submucosa & vessels exposed

05 Ulcer formation → bleed / perforation risk

H. pylori — Erodes from the inside out

Gram-negative bacteria release **urease** → ammonia neutralizes local acid → direct mucosal toxin release → chronic inflammation → ulcer. Tested via **urea breath test, stool antigen, endoscopy biopsy**.

NSAIDs — Strip away protection

Block **COX-1 → ↓ prostaglandins** → ↓ mucus, ↓ bicarbonate, ↓ mucosal blood flow. Acid then erodes unprotected tissue. Worst offenders: ASA, ibuprofen, naproxen, ketorolac — especially with steroids or anticoagulants.

Feature	Gastric Ulcer	Duodenal Ulcer
PAIN TIMING	**30–60 min** after meals	**2–3 hr** after meals / **nocturnal**
PAIN & FOOD	Food **WORSENS** pain	Food **RELIEVES** pain
WEIGHT	Weight **LOSS** (afraid to eat)	Weight stable or **GAIN** (eats for relief)

TYPICAL AGE	50–70 years	30–50 years
HALLMARK BLEED	**Hematemesis** (coffee-ground)	**Melena** (tarry stool)
MALIGNANCY RISK	Higher — **biopsy all gastric ulcers**	Rare

03 Signs *& Symptoms*

EARLY / MILD

What patients usually report first

- **Epigastric pain** — burning, gnawing, aching
- **Dyspepsia** — indigestion, heartburn
- Bloating, belching, early satiety
- Nausea, loss of appetite
- Pain **relieved** by antacids or food (duodenal)
- Pain **triggered** by food (gastric)

RED FLAGS · CALL HCP

Complications — act now

- **Hematemesis** — coffee-ground or bright red
- **Melena** — black, tarry, foul stool
- **Rigid, board-like abdomen** → perforation
- **Sudden, severe** epigastric pain radiating to shoulder
- **Hypotension + tachycardia** → hypovolemic shock
- Cold, clammy, pale skin; dizziness; syncope
- Persistent vomiting → obstruction

04 The Three *Complications*

MOST COMMON

Hemorrhage

Erosion into a submucosal vessel — #1 complication of PUD.

KEY CUES

- Hematemesis (bright red = active; coffee-ground = older)
- Melena (tarry stool)
- ↓ BP, ↑ HR, pale, cool skin
- ↓ Hgb/Hct on labs

MANAGEMENT

- NPO · large-bore IV · NS or LR bolus
- Type & crossmatch · prepare for transfusion
- IV PPI drip (pantoprazole)
- Endoscopy for clipping / cautery

MOST LETHAL

Perforation

Ulcer erodes fully through wall → GI contents spill into peritoneum → peritonitis.

KEY CUES

- Sudden, severe, sharp epigastric pain
- Pain radiates to **shoulder** (phrenic irritation)
- **Rigid, board-like abdomen**
- Absent bowel sounds · rebound tenderness
- Shock: hypotension, tachycardia, fever

MANAGEMENT

- **SURGICAL EMERGENCY** — notify HCP
- NPO · NG suction · IV fluids · broad-spectrum antibiotics
- Prep for laparotomy / repair

CHRONIC

Pyloric Obstruction

Edema & scarring near the pylorus block gastric outlet.

KEY CUES

- Feeling of fullness, early satiety
- Projectile vomiting of undigested food
- Foul-smelling emesis · weight loss
- Metabolic **alkalosis** from loss of HCl

MANAGEMENT

- NG decompression (low intermittent suction)
- NPO · IV fluids · replace K^+ and Cl^-
- Monitor I&O · daily weights
- Possible pyloroplasty

05 Priority *Nursing Interventions*

ABC **Airway** (aspiration risk if vomiting) → **Breathing** (monitor perfusion) → **Circulation** (bleed = shock risk). Every PUD patient with red-flag symptoms gets an **ABC-first assessment.**

1 **Monitor for GI bleeding**
Assess emesis & stool for blood; check Hgb, Hct, BUN. Hemoccult-test stools. Vital signs q4h (or more if bleeding).

2 **Maintain IV access**
Large-bore (18g) IV for fluids & possible blood. NS or LR for volume; NEVER dextrose with blood products.

3 **NPO during acute episodes**
Rest the GI tract. NG tube for decompression if active bleed, obstruction, or perforation.

4 **Assess pain patterns**
Document timing (with food vs empty stomach), location, radiation. Sudden severe pain → suspect perforation.

5 **Administer meds on schedule**
PPIs before meals; sucralfate on empty stomach; antacids 1–3 hr after meals & HS; complete antibiotic course.

6 **Monitor for shock**
↓ BP, ↑ HR, pallor, cool clammy skin, ↓ urine output, restlessness. Notify HCP immediately.

7 **Position & comfort**
Semi-Fowler's to reduce reflux and aspiration risk. Quiet environment; stress reduction.

8 **Prepare for diagnostics**
EGD (endoscopy) is gold standard — NPO 6–8 hr pre-procedure. H. pylori testing, CBC, type & cross.

06 Pharmacology *Core Drugs*

PROTON PUMP INHIBITOR

PPIs — "-prazole"

omeprazole · pantoprazole · esomeprazole · lansoprazole

ACTION	Irreversibly blocks H^+/K^+ ATPase pump → **suppresses acid**
TIMING	30–60 min **before** first meal of day
SIDE FX	Headache, diarrhea, ↑ fracture risk & **C. diff** with long-term use, low Mg^{2+}
TEACH	Do not crush ER caps; report black stools, muscle cramps

H_2 RECEPTOR BLOCKER

H2 Blockers — "-tidine"

famotidine · nizatidine · cimetidine

ACTION	Blocks histamine at H_2 receptor on parietal cells → **↓ acid**
TIMING	With meals & at bedtime
SIDE FX	**Cimetidine**: confusion in elderly, gynecomastia, many drug interactions
TEACH	Avoid alcohol; separate from antacids by 1 hour

MUCOSAL PROTECTANT

Sucralfate (Carafate)

coats the ulcer crater

ACTION	Forms **sticky gel** over ulcer → physical barrier from acid
TIMING	**Empty stomach** — 1 hr before meals & HS
SIDE FX	Constipation (most common); dry mouth
TEACH	Separate from other meds by 2 hr (↓ absorption); needs acid environment — no PPI same time

ANTACID

Antacids

aluminum hydroxide · magnesium hydroxide · calcium carbonate

ACTION	Neutralize existing gastric acid
TIMING	**1–3 hr after meals & at bedtime**
SIDE FX	**Aluminum** → constipation · **Magnesium** → diarrhea · **Calcium** → rebound acid
TEACH	Separate from other meds by 1–2 hr; avoid in renal disease (Mg toxicity)

PROSTAGLANDIN ANALOG

Misoprostol (Cytotec)

NSAID-induced ulcer prevention

ACTION	Replaces protective prostaglandins → ↑ mucus & bicarbonate
TIMING	With meals & HS
SIDE FX	Diarrhea, cramping
⚠ CONTRA	**PREGNANCY CATEGORY X** — causes uterine contractions/abortion. Pregnancy test before starting.

BISMUTH SUBSALICYLATE

Pepto-Bismol

used in quadruple therapy for H. pylori

ACTION	Coats ulcer + bactericidal to H. pylori
SIDE FX	**Black stools & black tongue** (harmless, but confuses with melena!)
⚠ CONTRA	Contains salicylate — avoid in children (Reye's), aspirin-allergic, bleeding disorders
TEACH	Warn that tongue & stool discoloration is expected

H. pylori Eradication — Triple Therapy (10–14 days)

Standard first-line regimen combines two antibiotics with acid suppression. Patient **must complete the full course** — incomplete therapy = antibiotic resistance & ulcer recurrence.

PPI
Omeprazole

+

Clari
Clarithromycin

+

Amox
Amoxicillin
(or metronidazole)

07 NCLEX *Test Traps*

Gastric vs Duodenal pain pattern
Students reverse these under pressure.

✓ **Gastric: food WORSENS pain · Duodenal: food RELIEVES pain**

Coffee-ground emesis ≠ fresh bleed
Coffee-ground = partially digested blood (slower, older). Bright red = active, brisk bleed.

✓ **Both require: Stop · NPO · IV · notify HCP**

Sucralfate timing trap
Sucralfate needs acid to activate. Giving it WITH a PPI or antacid defeats its mechanism.

✓ **Give sucralfate on empty stomach, separated from other drugs**

Bismuth black stools ≠ melena
Patients on Pepto-Bismol have black stools that are NOT GI bleeding.

✓ **Assess context · melena is tarry & foul, bismuth is dry/harmless**

Misoprostol in pregnancy
Category X — causes abortion. Always screen female patients of childbearing age.

✓ **Pregnancy test BEFORE starting · two forms of contraception**

Shoulder pain with PUD
Not musculoskeletal — it's **referred pain from perforation** irritating the phrenic nerve.

✓ **Sudden severe epigastric + shoulder pain = surgical emergency**

"Drink milk for ulcers" myth
Milk temporarily buffers acid, but **rebound acid secretion** makes ulcers WORSE.

✓ **Teach: avoid milk as a treatment · small frequent bland meals instead**

First action with a GI bleed
Tempting answer: "notify the HCP." Wrong first action.

✓ **FIRST: Assess ABCs & VS · THEN notify HCP**

08 Patient *Education*

Teach the patient to protect the healing mucosa — and recognize the signs of trouble early.

AVOID / STOP

- ✗ NSAIDs, aspirin, ibuprofen, naproxen
- ✗ Alcohol — irritates mucosa directly
- ✗ Smoking — delays healing, ↑ acid
- ✗ Caffeine (coffee, tea, cola, chocolate)
- ✗ Spicy foods & strong seasonings
- ✗ Very hot or very cold foods
- ✗ Citrus juices on empty stomach
- ✗ Late-night eating / lying down after meals
- ✗ Skipping doses of antibiotics

DO / ADOPT

- ✓ Eat **small, frequent meals** — 5–6/day
- ✓ Chew slowly; eat in a calm environment
- ✓ Take meds on schedule — PPIs before meals
- ✓ Complete the full H. pylori antibiotic course
- ✓ Manage stress — relaxation, sleep, exercise
- ✓ Report **black/tarry stools** immediately
- ✓ Report **coffee-ground vomit** or bright red blood
- ✓ Report **sudden severe pain** — go to ER
- ✓ Follow up for repeat H. pylori test post-therapy

09 Memory *Boosters*

MNEMONIC

BURP

Complications of PUD — in order of priority.

PATTERN

GUD *timing*

Gastric Up · Duodenal Delayed-Down.

B Bleeding — most common (hemorrhage)

U Ulcer perforation — most lethal

R Restricted outlet — pyloric obstruction

P Peritonitis — from spilled GI contents

G Gastric = pain Goes UP right after food (30–60 min)

U Weight goes Under (loss) because eating hurts

D Duodenal = pain Delayed 2–3 hr, relieved by food

H. PYLORI RX

"CAN *treat pylori*"

Triple therapy for H. pylori eradication.

C Clarithromycin — macrolide antibiotic

A Amoxicillin — or metronidazole if PCN-allergic

N Nexium (or any PPI) — acid suppression

RED FLAGS

"BLEED"

Signs that say STOP and call the HCP.

B Board-like abdomen → perforation

L Low BP + high HR → shock

E Emesis — coffee-ground or bright red

E Extreme, sudden pain → radiates to shoulder

D Dark tarry stools (melena)

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Clinical Judgment Measurement Model

01 Recognize Cues

02 Analyze Cues

03 Prioritize & Act

04 Evaluate Outcomes

Epigastric burning, timing of pain with food, coffee-ground emesis, melena, ↓ BP, ↑ HR, rigid abdomen. History of NSAID use, H. pylori, smoking.

Is this bleeding vs perforation vs obstruction? Gastric vs duodenal pattern? Cluster: abd pain + melena + ↓ Hgb = active GI bleed. Sudden severe pain + rigid abdomen = perforation.

ABCs first. NPO, large-bore IV, NS/LR bolus, VS q15 min for active bleed. NG suction. IV PPI. Notify HCP. Prep for endoscopy or surgery (perforation).

VS stable · Hgb/Hct trending up · pain controlled · no new bleeding · diet advanced · patient verbalizes trigger avoidance, med schedule, and when to call HCP.