

NCLEX-RN PHARM BRIEF • GI SYSTEM • 2026 TEST PLAN

Antacids

neutralize, don't suppress

Weak bases that raise gastric pH for rapid heartburn relief — deceptively "safe" OTC drugs hiding NCLEX traps around drug absorption, renal failure, and milk-alkali syndrome.

CLASS • ANTACID

SYSTEM • GI

ONSET • MINUTES

ROUTE • PO

01

DRUG OVERVIEW

Why we *give it*

- **Neutralize gastric HCl** — symptomatic relief only, does not heal ulcers
- **GERD** heartburn, reflux, dyspepsia
- **PUD** peptic ulcer disease (adjunct to H2 blockers/PPIs)
- **CKD** aluminum hydroxide → binds dietary **phosphate** in chronic kidney disease
- **Ca²⁺** calcium carbonate → calcium supplementation
- **Onset:** minutes · **Duration:** 30 min–3 hr (food extends effect)

02

MECHANISM OF ACTION

How it *works*

- 1 Weak base enters stomach
- ↓
- 2 Neutralizes **HCl** → salt + H₂O
- ↓
- 3 ↑ Gastric **pH** (>4)
- ↓
- 4 ↓ Pepsin activity
- ↓
- 5 Symptom relief

Does NOT block acid production (that's H2 blockers & PPIs). Pure neutralization.

THERAPEUTIC EFFECTS

03

Signs it's *working*

- Heartburn relief within **5–15 minutes**
- ↓ epigastric / retrosternal pain
- ↓ regurgitation & sour taste
- Patient can lie flat & sleep without symptoms
- **CKD:** ↓ serum phosphate toward 2.5–4.5 mg/dL
- Gastric pH on testing: **> 4**

SIDE EFFECTS & ADVERSE REACTIONS

04

What to *expect vs. fear*

COMMON

- **Aluminum** → constipation
- **Magnesium** → diarrhea
- **Calcium** → constipation, belching, *acid rebound*
- **Sodium bicarb** → belching, flatulence, fluid retention

SERIOUS / LIFE-THREATENING

- **Milk-Alkali Syndrome** (Ca^{2+} + dairy): hypercalcemia, metabolic alkalosis, AKI
- **Hypermagnesemia** in renal failure → ↓ reflexes, bradycardia, cardiac arrest
- **Metabolic alkalosis** (Na bicarb) → tetany, seizures
- **Aluminum toxicity** in CKD → osteomalacia, encephalopathy, dementia
- **Hypophosphatemia** (long-term Al) → bone pain, muscle weakness

05

PRIORITY NURSING CONSIDERATIONS

Assess • Monitor • Hold

- **ASSESS** renal function before Mg or Al antacids
- **ASSESS** med list — antacids affect absorption of MANY drugs
- **MONITOR** Ca^{2+} , Mg^{2+} , PO_4^{3-} , BUN/Cr, ABG (if Na bicarb)
- **MONITOR** bowel pattern — constipation vs. diarrhea
- **HOLD** Mg-based in renal impairment ($\text{CrCl} < 30$)
- **HOLD** Na bicarb in HF, HTN, edema, renal failure
- **HOLD** for undiagnosed abdominal pain or suspected obstruction
- **NOTIFY** HCP for black/tarry stools, hematemesis, persistent pain > 2 weeks
- **Drug interactions:** ↓ absorption of tetracyclines, fluoroquinolones, iron, digoxin, levothyroxine, warfarin — separate by 1-2 hours

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LABS & DIAGNOSTICS

Numbers to *watch*

CALCIUM

9.0–10.5 mg/dL

↑ with Ca carbonate → milk-alkali

MAGNESIUM

1.5–2.5 mEq/L

↑ in renal failure → cardiac risk

PHOSPHATE

2.5–4.5 mg/dL

↓ with long-term Al use

BUN / CREATININE

7–20 / 0.6–1.2

Baseline before Mg or Al antacids

ABG (NA BICARB)

pH 7.35–7.45

Watch for metabolic alkalosis

GASTRIC PH

> 4 = goal

Therapeutic neutralization

ADMINISTRATION & SAFETY

07

Timing is *everything*

- **Route:** PO only (tablet, chewable, liquid)
- **Timing:** 1 hour AFTER meals & at bedtime (peak acid window)
- **Liquids** > tablets for efficacy — shake well
- **Chew tablets thoroughly**, follow with water
- **Separate other meds** by 1–2 hours (chelation/absorption)
- Not for long-term self-treatment (> 2 weeks without HCP)
- Follow NG tube administration with flush

PATIENT EDUCATION

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What they *must know*

- Take **1 hr after meals & at bedtime** — not before eating
- Do not take within 1–2 hours of other oral medications (especially antibiotics, thyroid, iron, digoxin)
- **Avoid milk/dairy** with calcium carbonate → milk-alkali risk
- **Avoid salt substitutes** (contain KCl) + Na bicarb → electrolyte chaos
- Report: black stools, coffee-ground emesis, weight loss, pain > 2 weeks
- Lifestyle: elevate HOB, don't recline < 2 hr after meals, avoid trigger foods, smaller meals
- If pregnant: Ca carbonate preferred; avoid Na bicarb & prolonged Mg use
- If HF/HTN: avoid sodium bicarbonate (high Na load)

NCLEX TEST TRAPS ⚠️

Where students *lose points*

✗ **Trap:** "Antacids decrease acid production." **Truth:** They neutralize existing acid. H2 blockers & PPIs decrease production.

✗ **Trap:** Giving antacid before meals. **Truth:** Give 1 hour AFTER meals & at bedtime.

✗ **Trap:** "It's OTC, so it's safe with other meds." **Truth:** Antacids chelate & block absorption of tetracyclines, fluoroquinolones, iron, digoxin, levothyroxine, warfarin — space 1-2 hr apart.

✗ **Trap:** Giving Mg-based antacid to CKD patient. **Truth:** Kidneys can't excrete Mg → hypermagnesemia → cardiac arrest.

✗ **Trap:** Alka-Seltzer for HTN patient's heartburn. **Truth:** Sodium bicarb = massive Na load → worsens HF/HTN/edema.

✗ **Trap:** Recommending Tums + calcium-rich diet. **Truth:** Classic milk-alkali syndrome — hypercalcemia, alkalosis, AKI.

✗ **Trap:** "Calcium carbonate is gentle." **Truth:** Causes acid rebound — gastrin ↑ → hypersecretion of HCl after dose wears off.

✗ **Trap:** Ignoring dark stools in Al/bismuth user. **Truth:** Al can cause dark stools, BUT always rule out GI bleed first.

MEMORY BOOSTERS

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Make it *stick*

"Al = All backed up"

Aluminum → constipAtion

"Mg = Must Go"

Magnesium → diarrhea (think "Milk of Magnesia" laxative)

"CAMS"

The 4 antacid cations: **C**alcium · **A**luminum · **M**agnesium · **S**odium bicarb

"1-1-2 Rule"

1 hr after meals · at bedtime (HS) · separate other meds by **1-2** hr

"Maalox = Middle"

Al + Mg combo → cancels bowel side effects

MOST TESTED DRUGS IN CLASS

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Know the *differences*

DRUG	KEY EFFECT	NCLEX RED FLAG
Calcium carbonate Tums, Rolaids	Potent, fast; also Ca supplement	Acid rebound · milk-alkali · hypercalcemia
Aluminum hydroxide Amphojel	Phosphate binder in CKD	Constipation · hypophosphatemia · Al toxicity in CKD
Magnesium hydroxide Milk of Magnesia	Antacid + laxative effect	Diarrhea · <u>AVOID in renal failure</u> → cardiac arrest
Al + Mg combo Maalox, Mylanta	Balanced bowel effects	Still drug-interaction risk · avoid Mg in CKD
Sodium bicarbonate Alka-Seltzer	Rapid systemic alkalinizer	Metabolic alkalosis · Na load → AVOID HF/HTN/CKD

FINAL LAYER

Clinical Judgment *Snapshot*

Q • 01

What is the #1 priority risk with this drug?

Drug interactions — antacids alter gastric pH & chelate other oral meds, silently reducing absorption of **digoxin, levothyroxine, warfarin, fluoroquinolones, tetracyclines, iron**. A "harmless OTC" can cause therapeutic failure of a critical drug.

Q • 02

What will harm the patient FIRST?

Hypermagnesemia in renal failure — Mg-based antacid in a CKD patient → rapid rise in serum Mg → ↓ DTRs → **respiratory depression** → **bradycardia** → **cardiac arrest**. Second: Na bicarb tipping an HF patient into pulmonary edema.

Q • 03

What is the FIRST nursing action?

Assess renal function & full medication list before giving or teaching antacid use. Then **space the antacid 1–2 hours apart from all other oral medications**. For confirmed hypermagnesemia: stop the drug, notify HCP, prepare **IV calcium gluconate** (Mg antagonist).