

NCLEX-RN 2026 • PHARMACOLOGY

Glycopeptide antibiotics

Prototype: Vancomycin

Anti-infective system

High-alert IV medication

1 Drug overview — why we give it

- MRSA infections (methicillin-resistant Staph aureus) — the #1 tested use
- Severe gram-positive infections in penicillin-allergic patients
- Endocarditis caused by gram-positive organisms
- Oral vancomycin: C. difficile colitis (pseudomembranous colitis) only
- Bacterial meningitis (combined with other agents)
- Sepsis from gram-positive sources while awaiting cultures

2 Mechanism of action

Binds to D-alanyl-D-alanine → blocks peptidoglycan cross-linking → bacterial cell wall weakens → **bacterial lysis and death (bactericidal)**

- Acts on gram-positive bacteria ONLY (gram-negative cell wall blocks entry)
- Different binding site than penicillins — effective against resistant organisms
- Oral form is not absorbed — stays in the gut (that's why it works for C. diff)

3 Therapeutic effects — is it working?

- Decreased fever and normalizing temperature
- WBC trending down toward normal range
- Negative follow-up blood cultures
- Resolution of infection signs (redness, drainage, chills)
- Improved mental status in sepsis patients
- For C. diff: formed stools, decreased frequency of diarrhea
- Trough level 15–20 mcg/mL for severe MRSA infection

4 Side effects and adverse reactions

COMMON

- Red man syndrome (rapid infusion)
- Phlebitis at IV site
- Nausea, metallic taste
- Chills, fever with infusion

SERIOUS — LIFE THREATENING

- Nephrotoxicity (AKI, rising creatinine)
- Ototoxicity (permanent hearing loss, tinnitus)
- Thrombocytopenia, neutropenia
- Stevens-Johnson syndrome, DRESS
- Anaphylaxis (true IgE reaction)
- Vancomycin-resistant enterococcus (VRE)

5 Priority nursing considerations

ASSESS baseline renal function, hearing, IV site patency, allergies

MONITOR trough levels, BUN, creatinine, I&O, hearing, IV site for phlebitis

HOLD if trough exceeds 20 mcg/mL, creatinine rising, urine output dropping

NOTIFY provider of hearing changes, rash, oliguria, elevated trough

Drug interactions (synergistic toxicity):

- Aminoglycosides (gentamicin, tobramycin) — doubles nephrotoxicity and ototoxicity
- Loop diuretics (furosemide) — amplifies ototoxicity
- NSAIDs, contrast dye, cyclosporine — worsens kidney injury

6 Labs and diagnostics

Lab	Therapeutic range	What it means
Trough (severe)	15–20 mcg/mL	Draw 30 min BEFORE 4th dose
Trough (mild/mod)	10–15 mcg/mL	Skin, soft tissue infections
Creatinine	0.6–1.2 mg/dL	Rising = nephrotoxicity, HOLD
BUN	7–20 mg/dL	Kidney function indicator
Platelets	150–400 K/ μ L	Watch for thrombocytopenia

7 Administration and safety

- Infuse IV over at least 60 minutes — longer for doses above 1 g (90–120 min). Rapid infusion triggers red man syndrome.
- Use an infusion pump — never gravity or IV push
- Dilute properly per policy; check compatibility before co-administration
- Central line preferred for prolonged therapy — peripheral causes phlebitis
- NEVER give IM — causes severe tissue necrosis and pain
- Oral form for *C. diff* ONLY — oral will not treat systemic infection
- Rotate IV sites every 48–72 hours; assess each shift

8 Patient education

- Finish the entire course even if feeling better — stopping early causes resistance
- Report immediately: ringing in ears, hearing changes, dizziness, fullness in ears
- Report decreased urination, swelling of ankles, weight gain
- Report flushing, rash, itching of face, neck, chest during infusion
- Stay well hydrated unless fluid-restricted
- Oral vancomycin tastes unpleasant — may mix with juice, never with hot liquids
- Avoid alcohol during therapy
- Carry medical alert for allergies or prior reactions

9 NCLEX test traps

Trap 1: Red man syndrome vs anaphylaxis

Red man = histamine release from rapid infusion, NOT a true allergy. Response: SLOW the infusion, give antihistamine. Do not stop the drug permanently.

Trap 2: Oral vancomycin is not systemic

Oral form stays in the gut — only treats C. diff. Never prescribed for MRSA pneumonia or sepsis. A question with "MRSA bacteremia" and "oral vancomycin" is ALWAYS wrong.

Trap 3: Trough timing

Draw 30 minutes BEFORE the 4th dose — not after, not with the dose. Peak levels are generally not monitored routinely anymore.

Trap 4: Priority assessment

Creatinine and hearing are priorities — NOT liver enzymes. Vancomycin is renally cleared, liver is not the issue.

Trap 5: Dangerous combinations

Vancomycin + gentamicin = double nephrotoxic and ototoxic hit. If both ordered, verify and monitor levels closely.

10 Memory boosters

VANCO MNEMONIC

Very slow infusion
Auditory nerve damage
Nephrotoxicity
C. diff (oral form)
Only IV for systemic

QUICK RECALL

"Red man = rapid man" — slow it down
"Start low, go slow" for infusion rate
"Trough before, not after" — draw pre-dose
"Ears and kidneys" — the 2 toxicities
"Oral stays, IV plays" — route matters

CLINICAL JUDGMENT SNAPSHOT

#1 priority risk

Nephrotoxicity and ototoxicity — both can be permanent. Renal injury develops faster, hearing loss may be irreversible.

What harms the patient FIRST

Rapid IV infusion → massive histamine release → red man syndrome → possible hypotension and cardiovascular collapse within minutes.

FIRST nursing action (red man syndrome scenario)

STOP or SLOW the infusion immediately, then assess vitals, notify provider, administer diphenhydramine per order, restart at slower rate once resolved.

MOST TESTED DRUGS IN THIS CLASS

Drug	Route	Key use	NCLEX pearl
Vancomycin	IV, PO	MRSA, C. diff (PO)	Prototype — know everything
Telavancin	IV	Complicated skin, HAP	Black box: nephrotoxicity, pregnancy
Dalbavancin	IV	Skin infections	Once-weekly dosing (long half-life)
Oritavancin	IV	Skin infections	Single-dose regimen; interferes with coag labs