

Antibiotics *Part I*

• Penicillins • Cephalosporins • Carbapenems • Macrolides • Tetracyclines • Fluoroquinolones • Clindamycin

§1 · 18 CARDS

Advanced Flashcards

Each card maps to NCLEX-RN Client Needs: Pharmacological & Parenteral Therapies, Reduction of Risk Potential, and Safety & Infection Control. Hover for shadow effect; click "Reveal rationale" on each question.

CARD 01 · PENICILLINS

HIGH RISK

Penicillin G

Natural penicillin · IV/IM

MECHANISM (SIMPLE)

Breaks the bacteria's cell wall so the cell bursts. Bactericidal. Works against gram-positive cocci (strep, syphilis).

WHY GIVEN

Strep throat, syphilis (drug of choice), endocarditis prophylaxis, neonatal sepsis (group B strep).

MUST ASSESS BEFORE GIVING

① Penicillin/cephalosporin allergy (anaphylaxis history is absolute contraindication). ② Renal function (CrCl) — dose-reduce. ③ Pregnancy: Category B (safe for syphilis in pregnancy). ④ History of asthma/atopy (↑ allergy risk).

KEY LABS/MONITORING

BUN/creatinine, CBC (neutropenia with long use), serum potassium (Pen G potassium = high K+ load).

MOST DANGEROUS AE

Anaphylaxis — bronchospasm, angioedema, hypotension within minutes. Keep epinephrine at bedside for first dose.

COMMON SIDE EFFECTS

GI upset, rash, diarrhea, injection-site pain, candidiasis.

HOLD / NOTIFY PROVIDER

Rash, wheezing, swelling of lips/tongue, anaphylaxis signs. Also hold if patient develops *Jarisch-Herxheimer reaction* when treating syphilis (fever, chills, myalgia 1–2 hr after dose — not allergy, but notify).

ANTIDOTE / REVERSAL

Anaphylaxis: IM epinephrine 0.3–0.5 mg, O₂, IV fluids, antihistamines, steroids.

PATIENT TEACHING

"Tell every provider you got penicillin today; reactions can be delayed up to several hours. Complete the full course even if you feel better. Report rash, hives, difficulty breathing."

NURSING ACTION

Stay with the patient first 15–30 min after the first dose. Verify allergy band. Use a separate IV line if possible (do not mix with aminoglycosides — inactivation).

NGN CLINICAL JUDGMENT CUE

Patient itching at the IV site 10 minutes after Pen G starts and reports "tongue feels thick." → STOP infusion, raise HOB, call rapid response, prepare IM epinephrine.

PRIORITY QUESTION

A nurse is preparing to give IV penicillin G to a client with bacterial endocarditis. The client states, "I had a rash from amoxicillin as a kid but never any trouble breathing." Which action is the priority?

CARD 02 · AMINOPENICILLIN

TEACHING-HEAVY

Amoxicillin

Broad-spectrum penicillin · PO

MECHANISM

Same as Pen G — cell-wall disruption — but broader spectrum including some gram-negatives (H. influenzae, E. coli).

WHY GIVEN

Otitis media (drug of choice in peds), strep throat, sinusitis, UTI, H. pylori (triple therapy with PPI + clarithromycin).

MUST ASSESS

Penicillin allergy, mono (causes massive rash — almost universal — and is misdiagnosed as allergy), renal function, pregnancy (Category B).

KEY LABS

BUN/Cr, CBC with long courses.

MOST DANGEROUS AE

Anaphylaxis; Stevens-Johnson syndrome (rare).

COMMON SIDE EFFECTS

Diarrhea (very common), nausea, rash, vaginal candidiasis.

HOLD / NOTIFY

Watery diarrhea with blood/mucus → suspect *C. difficile*. Severe rash, mouth ulcers → SJS.

PATIENT TEACHING

"Take with or without food. Finish the entire bottle even if symptoms stop. If you're on birth control, use a backup method for this cycle. Probiotics or yogurt can help with diarrhea. Refrigerate the liquid form after mixing."

NURSING ACTION

Shake suspension well. For peds, give the calculated weight-based dose (typically 25–45 mg/kg/day divided q8–12h; up to 90 mg/kg/day for otitis media).

NGN CUE

Mom calls: "My 4-year-old has had antibiotics for 6 days, now has watery diarrhea 8 times today and a fever." → *C. diff* workup.

PRIORITY QUESTION

A nurse teaches a young woman about amoxicillin prescribed for sinusitis. Which client statement requires further teaching?

CARD 03 · EXTENDED-SPECTRUM PCN

HIGH RISK

Piperacillin–Tazobactam

Antipseudomonal · IV · "Zosyn"

MECHANISM

Piperacillin (penicillin) + tazobactam (β-lactamase inhibitor) — protects the penicillin from bacterial enzymes. Covers gram-positive, gram-negative including *Pseudomonas*, anaerobes.

WHY GIVEN

Hospital-acquired pneumonia, intra-abdominal infections, sepsis with unknown source, febrile neutropenia.

MUST ASSESS

Penicillin allergy, renal function (dose by CrCl), sodium load (Na⁺-rich — caution in HF/CKD), bleeding risk (high-dose interferes with platelets).

KEY LABS

BUN/Cr, electrolytes (K⁺ can ↓), CBC, platelets. Trough not routinely needed.

MOST DANGEROUS AE

Acute kidney injury (especially combined with vancomycin — "vanc-zosyn nephrotoxicity"), C. diff, anaphylaxis.

COMMON SIDE EFFECTS

Diarrhea, rash, headache, ↓ K⁺/↓ Mg.

HOLD / NOTIFY

Rising creatinine, oliguria, watery diarrhea, rash. Drug-induced thrombocytopenia.

PATIENT TEACHING

IV-only drug. "Report any rash, decreased urination, or severe diarrhea. We will monitor your kidney labs daily."

NURSING ACTION

Infuse over 30 min (or 4 hr extended-infusion protocol). Flush line — incompatible with LR, aminoglycosides. Monitor BUN/Cr q24h.

NGN CUE

Day 3 of pip-tazo + vancomycin: urine output 15 mL/hr × 2 hr, creatinine ↑ from 0.9 to 1.6. → AKI. Notify, recheck labs, anticipate switching agent.

PRIORITY QUESTION

A client with sepsis is receiving IV piperacillin-tazobactam and IV vancomycin. Which lab finding requires immediate provider notification?

CARD 04 · CEPHALOSPORINS 1ST GEN

SAFETY ALERT

Cefazolin

"Ancef" · IV · Surgical prophylaxis

MECHANISM

Cell-wall inhibitor (β-lactam, like penicillins). 1st-gen covers gram-positives (Staph, Strep) and limited gram-negatives.

WHY GIVEN

Surgical prophylaxis — must be given within 60 min before incision; skin/soft tissue infections; UTI.

MUST ASSESS

Penicillin allergy (cross-reactivity is now estimated <1–2% for cephalosporins; severe reaction to PCN = caution). Renal function. Bleeding (rare).

KEY LABS

BUN/Cr.

MOST DANGEROUS AE

Anaphylaxis, C. diff, SJS.

COMMON SIDE EFFECTS

GI upset, injection-site reactions, rash.

HOLD / NOTIFY

Severe reaction, watery diarrhea, rash with blistering. For surgery — verify it was given before incision time.

PATIENT TEACHING

"This is your pre-surgery antibiotic. We must give it before the procedure starts to prevent infection."

NURSING ACTION

Time-out: confirm dose given <60 min before incision (90 min for vancomycin/fluoroquinolones). Re-dose intra-op for long surgeries.

NGN CUE

Pre-op cefazolin was hung at 0700, incision at 0810 — that's 70 min: redose if surgery proceeds. Document timing precisely.

PRIORITY QUESTION

A pre-op nurse is preparing to administer cefazolin 2 g IV before a hip replacement scheduled at 0900. At what time should the infusion be completed?

CARD 05 · CEPHALOSPORINS 3RD GEN

HIGH RISK

Ceftriaxone

"Rocephin" · IV/IM · Broad gram-neg

MECHANISM

3rd-gen cephalosporin — broader gram-negative coverage, crosses blood-brain barrier.

WHY GIVEN

Meningitis, pneumonia, gonorrhea (1 dose IM), Lyme carditis, pyelonephritis, sepsis empirically.

MUST ASSESS BEFORE GIVING

- ① Penicillin allergy. ② NEVER MIX WITH CALCIUM-CONTAINING SOLUTIONS (E.G., LR) — fatal precipitation, especially in neonates. ③ Neonates with hyperbilirubinemia (displaces bilirubin → kernicterus). ④ Gallbladder disease (biliary sludge).

KEY LABS

BUN/Cr, LFTs, CBC, INR (rare bleeding).

MOST DANGEROUS AE

Fatal calcium-ceftriaxone precipitation in lungs/kidneys; hemolytic anemia; pseudolithiasis.

COMMON SIDE EFFECTS

Pain at IM site, diarrhea, mild ↑ LFTs.

HOLD / NOTIFY

Jaundice in neonate; co-administered LR running; bloody diarrhea.

PATIENT TEACHING

For gonorrhea: "Your partner must also be treated. Avoid intercourse for 7 days after treatment. Repeat testing in 3 months."

NURSING ACTION

Use a separate IV line from any calcium-containing fluid (LR, TPN with calcium). For IM in adults, mix with lidocaine to reduce pain — verify no lidocaine allergy.

NGN CUE

Neonatal ICU: order reads "ceftriaxone IV piggyback running with maintenance D5LR." → STOP. LR contains calcium — fatal precipitation risk. Switch fluid or hold ceftriaxone.

PRIORITY QUESTION

A nurse is caring for a 3-day-old neonate ordered ceftriaxone 50 mg/kg IV q24h for suspected sepsis. The infant is on continuous D5½NS with calcium gluconate added for hypocalcemia. What is the nurse's priority?

CARD 06 · CEPHALOSPORINS 4TH GEN

HIGH RISK

Cefepime

"Maxipime" · IV · Antipseudomonal

MECHANISM

4th-generation cephalosporin — broad gram-positive AND gram-negative including Pseudomonas. Penetrates CNS.

WHY GIVEN

Febrile neutropenia, hospital-acquired pneumonia, severe UTIs, meningitis, sepsis.

MUST ASSESS

Penicillin allergy, renal function (must dose-adjust — CNS toxicity rises with renal impairment), neuro baseline.

KEY LABS

BUN/Cr, CBC, electrolytes.

MOST DANGEROUS AE

Cefepime-induced neurotoxicity — encephalopathy, myoclonus, non-convulsive status epilepticus in renal impairment. Watch for confusion in elderly or AKI patients.

COMMON SIDE EFFECTS

Rash, diarrhea, ↑ LFTs.

HOLD / NOTIFY

New confusion, twitching, decreased LOC, seizures. Worsening renal function.

PATIENT TEACHING

"Report any confusion, jerky movements, or twitching — these are urgent." (Family teaching crucial for elderly.)

NURSING ACTION

Renal-dose adjustment is mandatory. Recheck creatinine daily. Monitor mental status.

NGN CUE

Day 4 cefepime, GFR drops from 60 → 30, patient becomes intermittently confused with myoclonic jerks. → Cefepime neurotoxicity. Hold drug, recheck CrCl, notify.

PRIORITY QUESTION

A 78-year-old client on cefepime for pneumonia develops new-onset confusion and brief facial twitching on day 4. CrCl is now 28 mL/min (was 50 on admission). What is the nurse's priority action?

CARD 07 · CARBAPENEM

HIGH RISK

Meropenem

"Merrem" · IV · Last-resort gram-neg

MECHANISM

Ultra-broad β -lactam: gram-positive, gram-negative, anaerobes, Pseudomonas, ESBL-producers. "Reserve" antibiotic.

WHY GIVEN

Severe nosocomial infections, ESBL gram-negatives, meningitis, mixed intra-abdominal infections, sepsis when broader coverage needed.

MUST ASSESS

Severe penicillin allergy (cross-reactivity exists but lower than older carbapenems), seizure history (meropenem lowers seizure threshold less than imipenem but still a risk), renal function, valproic acid use (carbapenems drop VPA levels — seizure risk).

KEY LABS

BUN/Cr, LFTs, CBC, drug levels if seizure history.

MOST DANGEROUS AE

Seizures (especially CNS infection, renal impairment, $\uparrow$ doses), anaphylaxis, C. diff.

COMMON SIDE EFFECTS

Diarrhea, headache, nausea, rash.

HOLD / NOTIFY

New seizure, severe rash, confusion. Hold VPA combo if breakthrough seizures occur.

PATIENT TEACHING

"This is a strong IV antibiotic. Report any twitching, confusion, or severe diarrhea immediately."

NURSING ACTION

Infuse over 15–30 min (or extended 3-hr infusion for resistant organisms). Watch for IV-site irritation.

NGN CUE

Epileptic patient on VPA admitted with meropenem ordered. Recent seizure-free for 2 years. $\rightarrow$ Notify provider; VPA levels will plummet within 24 hr, breakthrough seizures common. Consider alternative.

PRIORITY QUESTION

A nurse reviews orders for a client with bacterial meningitis: meropenem 2 g IV q8h. The client takes valproic acid 1500 mg/day for epilepsy. Which is the nurse's BEST action?

CARD 08 · CARBAPENEM

SAFETY ALERT

Imipenem–Cilastatin

"Primaxin" · IV

MECHANISM

Carbapenem + cilastatin (protects imipenem from kidney enzyme degradation). Broad spectrum like meropenem.

WHY GIVEN

Severe mixed-organism infections, intra-abdominal abscesses, sepsis.

MUST ASSESS

Seizure history (imipenem has the HIGHEST seizure risk of carbapenems), renal function, allergy.

KEY LABS

BUN/Cr, LFTs.

MOST DANGEROUS AE

Seizures (esp. CNS lesions, renal impairment), anaphylaxis. For CNS infections, prefer meropenem.

COMMON SIDE EFFECTS

N/V, infusion-related (rapid infusion $\rightarrow$ nausea), rash.

HOLD / NOTIFY

Any new seizure activity, severe nausea during infusion $\rightarrow$ slow rate.

PATIENT TEACHING

"Tell the nurse if you feel a wave of nausea during the infusion — we can slow it down."

NURSING ACTION

Infuse 500 mg over 20–30 min; 1 g over 40–60 min. Don't push.

NGN CUE

Patient with brain abscess: imipenem ordered. $\rightarrow$ Discuss meropenem as safer alternative for CNS infections (lower seizure risk).

PRIORITY QUESTION

Which client is at HIGHEST risk for seizures while receiving imipenem-cilastatin?

CARD 09 · MACROLIDE

SAFETY ALERT

Azithromycin

"Z-pack" · PO/IV · Atypicals

MECHANISM

Inhibits bacterial protein synthesis (50S ribosome). Bacteriostatic. Covers atypicals (Mycoplasma, Legionella, Chlamydia), strep, H. influenzae.

WHY GIVEN

Community-acquired pneumonia, pertussis, chlamydia (1 g PO × 1), bronchitis, MAC prophylaxis in HIV.

MUST ASSESS BEFORE GIVING

① Baseline ECG / QT interval — macrolides prolong QT. ② Hepatic function. ③ Cardiac history (long QT, recent MI). ④ Other QT-prolonging drugs (fluoroquinolones, ondansetron, methadone, antipsychotics, amiodarone). ⑤ Electrolytes — low K⁺ or low Mg ↑ QT.

KEY LABS

ECG (QTc), LFTs, K⁺, Mg⁺⁺.

MOST DANGEROUS AE

QT prolongation → torsades de pointes → cardiac arrest. Hepatotoxicity. Hearing loss with prolonged use.

COMMON SIDE EFFECTS

GI: nausea, diarrhea, abdominal cramping (macrolides increase motility).

HOLD / NOTIFY

QTc ≥ 500 ms, palpitations, syncope, new hepatitis signs, jaundice, hearing changes.

PATIENT TEACHING

"Take on empty stomach if possible, full glass of water. Report palpitations, fainting, or yellow skin. Do not take antacids within 2 hours."

NURSING ACTION

Get a baseline ECG if the client is high-risk. Replace K⁺/Mg before giving in cardiac patients. Stagger from antacids.

NGN CUE

Client on azithromycin, ondansetron, AND haloperidol — three QT-prolongers stacked. ECG QTc 510 ms. → Hold all and notify; lethal arrhythmia risk.

PRIORITY QUESTION

A nurse is reviewing the MAR for a hospitalized 68-year-old: azithromycin 500 mg IV daily, ondansetron 4 mg IV q6h PRN, citalopram 40 mg PO daily, metoprolol 25 mg PO BID. The morning ECG shows QTc 495 ms. Which action is priority?

CARD 10 · MACROLIDE

SAFETY ALERT

Erythromycin

PO/IV · Older macrolide

MECHANISM

50S ribosome inhibitor. Also stimulates motilin receptor → GI motility (used as prokinetic in gastroparesis).

WHY GIVEN

Pertussis (alternative), gastroparesis (off-label), neonatal eye prophylaxis (ointment), atypical pneumonia.

MUST ASSESS

QT interval, hepatic function, drug interactions (very strong CYP3A4 inhibitor — interacts with statins, warfarin, theophylline, carbamazepine, many).

KEY LABS

ECG, LFTs, INR if on warfarin.

MOST DANGEROUS AE

QT prolongation/torsades, cholestatic hepatitis, severe GI cramping. Infantile hypertrophic pyloric stenosis (in newborns <2 weeks).

COMMON SIDE EFFECTS

Severe nausea/vomiting/cramping (worst of all macrolides), diarrhea.

HOLD / NOTIFY

Jaundice, severe abdominal pain, projectile vomiting in newborn, palpitations.

PATIENT TEACHING

"Many interactions — show this medication to every pharmacist. Report jaundice or severe stomach pain."

NURSING ACTION

Newborn eye ointment is given within 1 hour of birth — single thin ribbon to each lower conjunctival sac.

NGN CUE

2-week-old infant on PO erythromycin develops projectile vomiting and visible abdominal peristalsis. → Pyloric stenosis. Surgical emergency.

PRIORITY QUESTION

A nurse is administering erythromycin ophthalmic ointment to a newborn. Which technique is correct?

CARD 11 · MACROLIDE

TEACHING-HEAVY

Clarithromycin

"Biaxin" · PO

MECHANISM

50S ribosome inhibitor.

WHY GIVEN

H. pylori (triple/quadruple therapy with PPI + amoxicillin), MAC, community-acquired pneumonia, sinusitis.

MUST ASSESS

QT, statin use (rhabdomyolysis risk), warfarin (↑ INR), pregnancy (Category C — generally avoided).

KEY LABS

ECG, LFTs, INR if on warfarin.

MOST DANGEROUS AE

QT prolongation, hepatotoxicity, rhabdomyolysis when combined with statins (esp. simvastatin, lovastatin).

COMMON SIDE EFFECTS

Metallic taste (classic), nausea, diarrhea, headache.

HOLD / NOTIFY

Muscle pain/dark urine on statin, jaundice, palpitations.

PATIENT TEACHING

"You may notice a metallic taste — normal. Take with food. Report muscle pain or dark urine. If you take a statin, your provider may pause it during this course."

NURSING ACTION

Confirm patient is not on simvastatin/lovastatin (contraindicated). H. pylori regimen: complete the FULL 10–14 days; partial therapy = resistance.

NGN CUE

Patient on clarithromycin + simvastatin reports thigh pain × 2 days, urine is tea-colored. → Rhabdomyolysis. Check CK, hold both drugs.

PRIORITY QUESTION

A nurse is teaching about a clarithromycin-based H. pylori regimen. Which client statement indicates the BEST understanding?

CARD 12 · TETRACYCLINE

TEACHING-HEAVY

Doxycycline

PO/IV · Atypicals · "Vibramycin"

MECHANISM

Binds 30S ribosome → blocks protein synthesis. Bacteriostatic. Covers atypicals, Rickettsia, Chlamydia, Lyme, anthrax, acne.

WHY GIVEN

Rocky Mountain spotted fever, Lyme, chlamydia, acne, malaria prophylaxis, MRSA skin infections, COPD exacerbation.

MUST ASSESS BEFORE GIVING

① Pregnancy (Category D — teratogenic, tooth/bone effects in fetus). ② Age <8 (permanent tooth discoloration). ③ Sun exposure plans (severe photosensitivity). ④ Antacids, dairy, iron, calcium — chelate the drug, reduce absorption.

KEY LABS

LFTs, BUN/Cr (still preferred in renal impairment vs other tetracyclines).

MOST DANGEROUS AE

Esophageal ulceration (if taken without water/lying down), hepatotoxicity, fetal harm, intracranial hypertension.

COMMON SIDE EFFECTS

Photosensitivity, GI upset, vaginal candidiasis.

HOLD / NOTIFY

Pregnancy positive, severe sunburn, severe headache/vision changes, child <8 years.

PATIENT TEACHING

"Take with a full glass of water and stay upright for 30 minutes. Avoid sunlight — use SPF 50, hat, long sleeves. Do not take with milk, antacids, iron, or calcium within 2 hours. Use backup contraception. Stop if you become pregnant."

NURSING ACTION

Verify age and pregnancy. Schedule away from dairy/antacids.

NGN CUE

Teen taking doxy for acne calls: "I went to the beach yesterday and now my whole back is blistered." → Severe photosensitivity reaction. Stop drug, treat burn.

PRIORITY QUESTION

A nurse is teaching a 16-year-old client prescribed doxycycline for acne. Which statement requires further teaching?

CARD 13 · TETRACYCLINE

TEACHING-HEAVY

Tetracycline

PO · Older generation

MECHANISM

30S ribosome inhibitor (same class as doxycycline).

WHY GIVEN

H. pylori (quadruple therapy), acne, less common today than doxycycline.

MUST ASSESS

Same as doxy + EXPIRATION DATE: outdated tetracycline → Fanconi syndrome (renal tubular damage). Renal function (contraindicated in renal impairment).

KEY LABS

BUN/Cr, LFTs.

MOST DANGEROUS AE

Outdated drug → nephrotoxicity (Fanconi). Fatty liver in pregnancy. Tooth discoloration in <8 yrs.

COMMON SIDE EFFECTS

GI, photosensitivity, candidiasis.

HOLD / NOTIFY

Expired vial/bottle, pregnancy, child <8, renal impairment.

PATIENT TEACHING

"Discard any leftover tablets after the prescribed course — expired tetracycline can damage kidneys. Same rules as doxycycline: water, sun, no dairy."

NURSING ACTION

Always check expiration date — this is a tested NCLEX point.

NGN CUE

Patient self-treats UTI with leftover tetracycline from prior year → presents with AKI. Suspect expired drug toxicity.

PRIORITY QUESTION

Which assessment finding is MOST important before administering tetracycline?

CARD 14 · FLUOROQUINOLONE

HIGH RISK · BBW

Ciprofloxacin

"Cipro" · PO/IV

MECHANISM

Inhibits bacterial DNA gyrase / topoisomerase IV → DNA breaks. Bactericidal. Strong gram-negative coverage including Pseudomonas.

WHY GIVEN

Complicated UTI/pyelonephritis, anthrax, traveler's diarrhea, prostatitis, bone/joint infections.

MUST ASSESS (BLACK BOX WARNINGS)

① Tendon disorders / steroid use / age >60 (Achilles rupture). ② Aortic aneurysm / dissection history. ③ Myasthenia gravis (worsens weakness — contraindicated). ④ QT prolongation / arrhythmia. ⑤ Peripheral neuropathy. ⑥ CNS effects (seizures, hallucinations). ⑦ Hypoglycemia/hyperglycemia in diabetics. ⑧ Pregnancy (Category C — cartilage harm in fetus). ⑨ Children (cartilage damage — restricted use).

KEY LABS

Glucose, ECG, BUN/Cr, LFTs.

MOST DANGEROUS AE

Tendon rupture (Achilles), aortic dissection/rupture, C. diff, QT/torsades, dysglycemia, peripheral neuropathy (sometimes permanent).

COMMON SIDE EFFECTS

Nausea, diarrhea, headache, dizziness, photosensitivity.

HOLD / NOTIFY

Tendon pain/snap, severe abdominal/back pain (dissection!), confusion, tingling/numbness, hypoglycemia.

PATIENT TEACHING

"Stop and call if you feel a tendon pop or pain — rest the limb. Avoid dairy/antacids/iron within 2 hours. Avoid sun. If you have diabetes, check sugar more often. Stay hydrated."

NURSING ACTION

Separate from cations (Ca, Mg, Fe, Zn, antacids) by 2+ hours. Avoid in pregnancy and pediatrics unless no alternative.

NGN CUE

72-year-old man on prednisone + cipro for UTI. Day 5: sudden "snap" in calf, can't plantar-flex. → Achilles tendon rupture. Immobilize, urgent ortho.

PRIORITY QUESTION

Which client is the BEST candidate for ciprofloxacin therapy?

CARD 15 · FLUOROQUINOLONE

HIGH RISK · BBW

Levofloxacin

"Levaquin" · PO/IV · Respiratory

MECHANISM

Same as cipro — DNA gyrase inhibitor. Better gram-positive (strep pneumo) coverage = "respiratory FQ."

WHY GIVEN

Community-acquired pneumonia, sinusitis, complicated UTI, anthrax, plague.

MUST ASSESS

All FQ black-box warnings (see cipro card). Diabetes management. ECG (QT).

KEY LABS

Glucose, ECG, BUN/Cr.

MOST DANGEROUS AE

Same as cipro — tendon, aortic, neurologic, dysglycemia.

COMMON SIDE EFFECTS

GI, headache, insomnia, photosensitivity.

HOLD / NOTIFY

Hypoglycemia (esp. diabetics on sulfonylureas/insulin), tendon pain, mental status changes.

PATIENT TEACHING

"If diabetic, check sugars more often — this drug can cause low or high sugars. Sun protection. Avoid dairy/antacids around dosing."

NURSING ACTION

Once-daily dosing (convenient). Monitor glucose in diabetics.

NGN CUE

Elderly diabetic on glipizide + levofloxacin: morning glucose 38 mg/dL, sweating, confused. → FQ-induced hypoglycemia. Treat with D50, hold both, notify.

PRIORITY QUESTION

An 82-year-old client with type 2 DM (on glipizide) is started on levofloxacin for pneumonia. Which is the priority teaching?

CARD 16 · FLUOROQUINOLONE

HIGH RISK · BBW

Moxifloxacin

"Avelox" · PO/IV · Respiratory

MECHANISM

Same FQ mechanism. Strongest QT-prolonging effect of the FQs.

WHY GIVEN

Community-acquired pneumonia, complicated skin infections, intra-abdominal (with metronidazole).

MUST ASSESS

QT (most QT-prolonging FQ), other QT drugs, FQ black-box warnings.

KEY LABS

ECG (QTc), K⁺, Mg⁺⁺.

MOST DANGEROUS AE

Torsades de pointes, FQ-class toxicities. Not renally dose-adjusted (different from cipro/levo).

COMMON SIDE EFFECTS

GI, dizziness, headache.

HOLD / NOTIFY

QTc >500, palpitations, syncope.

PATIENT TEACHING

"This medication affects your heart rhythm. Report fainting, chest fluttering, or feeling lightheaded immediately."

NURSING ACTION

Do not use for UTI — moxifloxacin has poor urinary concentrations. Spacing from cations same as other FQs.

NGN CUE

Patient with QTc 480 (baseline 440) on moxi + amiodarone develops syncope. → Likely torsades. Defib pads ready, IV mag, hold meds.

PRIORITY QUESTION

Which order should the nurse question?

CARD 17 · LINCOSAMIDE

HIGH RISK · C.DIFF

Clindamycin

"Cleocin" · PO/IV · Anaerobes & MRSA

MECHANISM

Binds 50S ribosome → blocks protein synthesis. Bacteriostatic. Covers gram-positives (including some MRSA), anaerobes (Bacteroides, oral anaerobes).

WHY GIVEN

Skin/soft-tissue infections (MRSA), dental infections, aspiration pneumonia, surgical prophylaxis if PCN-allergic, severe group A strep with toxic-shock-syndrome (combined with penicillin), bacterial vaginosis.

MUST ASSESS BEFORE GIVING

① History of C. difficile — clindamycin has the HIGHEST C. diff risk of common antibiotics. ② GI disease (colitis). ③ Liver function. ④ Allergy.

KEY LABS

LFTs, CBC.

MOST DANGEROUS AE

Pseudomembranous colitis / C. difficile colitis — can be fatal. Severe rash (SJS rare). Hepatotoxicity.

COMMON SIDE EFFECTS

Diarrhea (always evaluate for C. diff if >3 watery stools), nausea, metallic taste, rash.

HOLD / NOTIFY

Any watery diarrhea, blood/mucus in stool, fever, severe abdominal pain → suspect C. diff. Stop the drug, notify, contact precautions.

PATIENT TEACHING

"Report any diarrhea — even after you finish the medication (can develop weeks later). Take with a full glass of water. Do not take antidiarrheals like loperamide — they trap toxins."

NURSING ACTION

Contact precautions (gown + gloves) for suspected/confirmed C. diff. Soap and water — NOT alcohol gel (spores resist alcohol). Single-room isolation.

NGN CUE

Day 6 of clindamycin: 8 watery stools in 12 hours, abdominal cramping, low-grade fever, WBC 18 K. → C. diff. Stop drug, isolate, stool C. diff PCR/toxin, start PO vancomycin or fidaxomicin.

PRIORITY QUESTION

A nurse cares for a client on day 5 of clindamycin who has had 6 watery stools in 8 hours. Which is the priority intervention?

CARD 18 · CEPHALOSPORIN 5TH GEN

SAFETY ALERT

Ceftaroline

"Teflaro" · IV · MRSA-active

MECHANISM

5th-gen cephalosporin — uniquely covers MRSA (binds PBP2a). Broad gram-positive + gram-negative; not Pseudomonas.

WHY GIVEN

MRSA pneumonia, complicated skin infections including MRSA, endocarditis (off-label).

MUST ASSESS

Penicillin allergy, renal function, hemolytic anemia history.

KEY LABS

CBC (Coombs+ hemolytic anemia in ~10%), BUN/Cr.

MOST DANGEROUS AE

Coombs-positive hemolytic anemia, C. diff, anaphylaxis.

COMMON SIDE EFFECTS

Diarrhea, nausea, rash, eosinophilia.

HOLD / NOTIFY

Drop in hemoglobin without bleeding, jaundice, severe diarrhea.

PATIENT TEACHING

"This is a strong IV antibiotic. Report fatigue, dark urine, or yellow skin."

NURSING ACTION

Reserve for MRSA infections. Monitor CBC and reticulocyte counts during long courses.

NGN CUE

Day 10 ceftaroline: Hgb drop from 12 → 9, ↑ LDH, +Coombs. → Drug-induced hemolytic anemia. Stop, notify, transfuse if symptomatic.

PRIORITY QUESTION

A client on ceftaroline for 9 days for MRSA pneumonia develops fatigue, jaundice, and dark urine. Lab: Hgb 8.5 (was 12), positive direct Coombs test, elevated LDH. What is the likely cause?

§2 · NON-NEGOTIABLE

Must-Not-Miss Safety Rules

If you only remember five things from Day 5, remember these. Each is repeatedly tested on the NCLEX-RN and represents a sentinel-event risk.

Stay 15-30 minutes after the FIRST dose of any β -lactam

01

Penicillins, cephalosporins, and carbapenems can cause anaphylaxis within minutes. Have epinephrine, oxygen, and IV fluids accessible. Document baseline vitals before infusing.

Ceftriaxone + Calcium = NEVER in neonates

02

Fatal pulmonary/renal precipitation has occurred. In neonates ≤ 28 days, do not co-administer at all — even in separate lines. Check IV fluids (LR contains calcium).

Clindamycin + watery diarrhea = C. diff until proven otherwise

03

Stop the drug, contact precautions, soap-and-water hand hygiene (NOT alcohol gel), single-room isolation, stool toxin/PCR, start PO vancomycin or fidaxomicin. Never give loperamide.

Fluoroquinolones: 8 Black-Box Warnings — know them cold

04

T-A-M-P-K-Q-S-N: Tendon rupture, Aortic dissection, Myasthenia worsening, Pregnancy/Pediatrics, QT, Sugar dysregulation, Neuropathy. Hold for any tendon pain, sudden back pain, or hypoglycemia.

Tetracyclines: never in pregnancy, <8 years, or with dairy

05

Permanent tooth discoloration, fetal harm, and 50% loss of absorption with calcium/iron/antacids. Take upright with full water; sun precautions mandatory.

§3 · 5 CALCULATIONS

Dosage & Safety Math

Show your work. Use the <Reveal> toggle only after attempting each calculation. Round per standard NCLEX rules.

1

The provider orders amoxicillin 80 mg/kg/day PO divided q8h for an 18-month-old with otitis media weighing 24 lb. The pharmacy supplies amoxicillin 250 mg/5 mL. How many mL will the nurse administer per dose?

Weight: $24 \text{ lb} \div 2.2 = 10.9 \text{ kg}$ (round to 10.9)
Total daily dose: $80 \times 10.9 = 872 \text{ mg/day}$
Per dose ($\div 3$): $872 \div 3 = 290.7 \text{ mg/dose}$
Volume: $290.7 \text{ mg} \times (5 \text{ mL} / 250 \text{ mg}) = 5.81 \text{ mL}$
Round to: **5.8 mL per dose**

Answer: 5.8 mL PO q8h

2

Cefazolin 2 g IV is ordered to infuse over 30 minutes. The pharmacy sends a 100 mL bag. The IV pump is set to mL/hr. What rate will the nurse program?

Volume: 100 mL
Time: 30 min = 0.5 hr
Rate = Volume ÷ Time = 100 mL ÷ 0.5 hr = **200 mL/hr**

Answer: 200 mL/hr

3

The provider orders azithromycin 10 mg/kg PO ×1, then 5 mg/kg PO daily ×4 days for a child weighing 33 lb. The suspension is 200 mg/5 mL. How many mL is the LOADING dose, and how many mL is each daily dose?

Weight: 33 ÷ 2.2 = **15 kg**
Loading: 15 × 10 = 150 mg → 150 × (5/200) = **3.75 mL**
Daily: 15 × 5 = 75 mg → 75 × (5/200) = **1.875 mL** → round to **1.9 mL**

Loading: 3.75 mL · Daily: 1.9 mL

4

Ciprofloxacin 400 mg IV q12h is ordered. Each 200 mg vial = 20 mL. The drug is added to 100 mL of NS and infused over 60 minutes. The set delivers 15 gtt/mL. What is the rate in gtt/min?

Total volume: 100 mL (cipro is co-bagged; assume final volume 100 mL)
Time: 60 min
gtt/min = (mL × drop factor) ÷ minutes
= (100 × 15) ÷ 60 = 1500 ÷ 60 = **25 gtt/min**

Answer: 25 gtt/min

5

Vancomycin (Day 6 review – tomorrow's preview): A client weighs 176 lb. The provider orders 15 mg/kg IV q12h. The pharmacy mixes the dose in 250 mL D5W. The recommended max infusion rate is 1 g/hr to prevent Red Man Syndrome. What dose will be given, and what is the minimum infusion time?

Weight: 176 ÷ 2.2 = **80 kg**
Dose: 80 × 15 = **1,200 mg = 1.2 g**
Min time at 1 g/hr: 1.2 g ÷ 1 g/hr = **1.2 hr ≈ 72 min**
Standard practice: infuse ≥ 60 min per gram → infuse over **at least 72 minutes (round up to 90 min for safety)**

Dose 1.2 g · Infuse ≥ 72-90 min

§4 · 5 NGN ITEMS

Next Generation NCLEX Questions

Mixed formats: Matrix, Bow-tie, SATA, Drag-and-drop prioritization, Cloze drop-down. Each tests clinical judgment beyond simple recall.

ITEM 1 · MATRIX / GRID

For each finding listed below, indicate whether it is *Expected*, *Unexpected (notify provider)*, or *Anticipated patient teaching opportunity* in a client receiving doxycycline 100 mg PO BID for Lyme disease.

FINDING	EXPECTED	UNEXPECTED – NOTIFY	TEACHING OPPORTUNITY
Mild nausea after first dose	✓		
New severe sunburn after a 20-min walk		✓	
Client reports taking medication with milk			✓
Positive home pregnancy test on day 4		✓	
Reports vaginal yeast infection on day 10	✓		
Sudden, severe headache with blurred vision		✓	
Asks if she can finish the bottle and save the leftovers			✓

RATIONALE

Mild nausea and candidiasis are expected antibiotic side effects. Severe sunburn = photosensitivity (notify; stop drug). Pregnancy = Category D, teratogenic — stop immediately, notify. Severe headache + vision change = intracranial hypertension (rare doxy toxicity) — notify, may need ophtho. Milk and "save leftovers" are teachable moments — chelation reduces absorption; expired tetracyclines cause nephrotoxicity.

ITEM 2 · BOW-TIE

A 78-year-old client receives day 4 of cefepime 2 g IV q8h for hospital-acquired pneumonia. The client is now confused, with myoclonic jerks of the arms. CrCl on admission was 55 mL/min; today is 24 mL/min. Complete the bow-tie.

ACTIONS TO TAKE

Hold next cefepime dose
Notify prescriber immediately
Initiate seizure precautions

CONDITION MOST LIKELY

**Cefepime-induced
neurotoxicity (in renal
impairment)**

PARAMETERS TO MONITOR

Mental status / LOC q1h
Serum creatinine / CrCl daily
EEG if non-convulsive status suspected

RATIONALE

Cefepime renal-excreted; in AKI, drug accumulates and crosses the BBB. Encephalopathy + myoclonus + AKI is classic. Holding the dose is essential; reversal takes 2–7 days after stopping. Do NOT push for benzodiazepine first — fix the cause.

ITEM 3 · SELECT ALL THAT APPLY (SATA)

A nurse is preparing to administer IV azithromycin 500 mg to a hospitalized client. Which findings would cause the nurse to **HOLD the dose and notify the provider**? Select all that apply.

- ☒ Baseline ECG QTc 510 ms
- ☒ Serum potassium 2.9 mEq/L
- ☒ Concurrent ondansetron and methadone
- ☐ Mild diarrhea since admission
- ☒ New onset palpitations and dizziness
- ☐ Productive cough with green sputum
- ☒ AST 280 / ALT 310 (both 6× ULN)

RATIONALE

Holds: QTc > 500 ms (torsades risk), hypokalemia (potentiates QT), QT-prolonging drug stacking, new palpitations (possible early arrhythmia), and significantly elevated transaminases (azithromycin hepatotoxicity). Do NOT hold: mild GI symptoms (expected) and productive cough (the infection being treated).

ITEM 4 · ORDERED RESPONSE / PRIORITIZATION

A nurse caring for a client on day 7 of clindamycin for cellulitis is told the client has had 8 watery, foul-smelling stools in 6 hours with abdominal cramping. Place the following nursing actions in priority order (1 = first).

1. Stop the clindamycin and notify the provider
2. Place client on contact precautions in a private room
3. Collect stool specimen for C. difficile toxin/PCR
4. Wash hands with soap and water (not alcohol gel)
5. Begin oral vancomycin or fidaxomicin as ordered
6. Educate the client on hand hygiene and isolation

RATIONALE

Stop the offending drug first (removes the cause). Isolate to prevent spread. Diagnose with stool testing. Hand-hygiene with soap and water inactivates spores (alcohol does NOT). Treat with PO vancomycin or fidaxomicin (NOT IV — must contact intestinal lumen). Education last because the immediate priority is patient safety and containment.

ITEM 5 · CLOZE / DROP-DOWN

Complete the sentences using the most appropriate options:

A 70-year-old man on chronic prednisone is admitted with a complicated UTI. The provider orders **[ciprofloxacin]** 400 mg IV q12h. Before administering, the nurse recognizes the client is at **[high]** risk for Achilles tendon rupture because age >60 and steroid use are additive risks. The nurse should also avoid giving the dose within 2 hours of **[antacids, dairy, iron, or calcium]**, which would **[chelate the drug and reduce absorption]**. The most concerning new symptom requiring immediate cessation is **[sudden calf pain or "snap"]**.

Options provided (drop-down): ciprofloxacin / nitrofurantoin / azithromycin · high / low / no · antacids dairy iron calcium / leafy greens / NSAIDs · chelate drug / accelerate clearance / cause vomiting · calf pain / mild diarrhea / itchy rash

RATIONALE

Cipro is the FQ of choice for complicated UTI. Triad of age + steroid + FQ = Achilles risk. FQs bind divalent cations. Tendon "snap" or sudden pain is the BBW symptom for which the drug must be stopped and the limb immobilized.

§5 · NCJMM CASE

Mini Case Study — Clinical Judgment

Case: 62-year-old with septic shock

Mr. R., 62, is admitted to the ICU from the ED with septic shock from suspected intra-abdominal source. Past medical history: T2DM (on glipizide), CKD stage 3 (baseline Cr 1.6, CrCl 38 mL/min), atrial fibrillation on metoprolol and warfarin, PCN allergy ("rash as a child"). Initial empiric orders: pip-tazo 4.5 g IV q6h, vancomycin 1 g IV q12h, ondansetron PRN, IV norepinephrine. The ED nurse hands off to ICU.

1

RECOGNIZE CUES

What does the nurse notice?

- Reported PCN allergy — needs clarification (mild rash vs. anaphylaxis history)
- Baseline renal impairment (CrCl 38) — narrow window for nephrotoxic drugs
- Pip-tazo + vancomycin combination = synergistic AKI risk
- Warfarin + ondansetron + possible azithromycin (often added) = QT and INR considerations
- Glipizide + future fluoroquinolone risk if added = hypoglycemia

2

ANALYZE CUES

What patterns matter?

- The "rash as a child" PCN allergy is non-specific — could be viral exanthem, not IgE. Cross-reactivity for pip-tazo (a penicillin) is real. An allergy specialist consult or penicillin skin test can confirm.
- Pip-tazo + vanc together carry well-documented additive nephrotoxicity (10–35% AKI rates in studies).
- Empiric coverage for intra-abdominal source needs gram-positive, gram-negative, anaerobes. Carbapenem (meropenem) is an alternative if PCN allergy is severe.
- Sepsis = need broad coverage within 1 hour of recognition.

3

PRIORITIZE HYPOTHESES

Most likely / most dangerous

- **Most urgent:** Septic shock — antibiotics within the hour save lives.
- **Greatest risk to monitor:** Pip-tazo + vanc nephrotoxicity superimposed on CKD.
- **Secondary risk:** Allergic reaction to pip-tazo (less likely if true mild rash).
- **Tertiary:** Drug interactions (warfarin, glucose).

4

GENERATE SOLUTIONS

Options the nurse can advocate for

- Clarify the PCN allergy history immediately — interview family if patient unable.
- If severe-reaction history → recommend meropenem + vanc instead.
- Renal-dose adjust pip-tazo (4.5 g q8h or q12h based on CrCl 38).
- Vancomycin: dose by weight, draw trough before 4th dose, target AUC-guided level.
- Strict I&O; daily BUN/Cr; hold metformin (if on it) for sepsis.
- Stagger PO meds away from possible PO cation-containing dose if FQ added later.

5

TAKE ACTION

Concrete nursing implementation

- Administer first antibiotic dose within 60 min — DO NOT delay for skin testing in shock.
- Document allergy clarification (called daughter — "rash, age 5, no breathing trouble"). Recommend pharmacy/allergy follow-up.
- Place foley for accurate UOP; report <0.5 mL/kg/hr.
- Vanc trough before 4th dose; pip-tazo levels not routine.
- BMP, Mg++, phos q12h × 48 h.
- Hold warfarin during acute sepsis per protocol; check INR daily.
- Glipizide held while NPO; sliding-scale insulin if hyperglycemic.

6

EVALUATE OUTCOMES

What does success look like? What signals failure?

- **Success (24–48 h):** Lactate trending down; UOP >0.5 mL/kg/hr; Cr stable or slightly improved; MAP >65 off pressors; afebrile; WBC trending toward normal.
- **Failure signals:** Cr rising (AKI from pip-tazo + vanc), oliguria, persistent fever, rising lactate, new rash/wheezing (allergy), INR >5 (drug interaction), confusion (cefepime-class neurotox if escalated).
- **Action if failing:** Source control review (imaging, surgical consult); de-escalate or change agents based on cultures; nephrology consult if AKI progresses.

S6 · STOP & ACT

Red Flag Findings — Day 5

If you see any of these, the answer is almost always: stop the drug, notify the provider, and initiate the listed action.

ANAPHYLAXIS

Wheezing, hives, hypotension, angioedema during β-lactam infusion. → STOP infusion. IM epinephrine 0.3 mg, O₂, IV fluids, rapid response.

ACHILLES SNAP ON FQ

Sudden pain or pop in calf/ankle on cipro/levo/moxi. → STOP drug. Immobilize, urgent ortho consult.

SUDDEN CHEST/BACK PAIN ON FQ

Especially in elderly with HTN/aneurysm history. → Possible aortic dissection. STAT CT angiogram.

NEW CONFUSION + MYOCLONUS ON CEFEPIME

Especially with declining renal function. → Hold drug, EEG, neuro check q1h.

WATERY DIARRHEA ON CLINDAMYCIN

≥3 stools, mucus/blood, fever. → C. diff. STOP drug, contact isolation, soap-and-water.

QTC >500 MS ON AZITHROMYCIN/MOXIFLOXACIN

Or palpitations / syncope. → Hold drug. Replace K+/Mg. ECG monitoring.

CEFTRIAZONE RUNNING WITH CALCIUM

Especially in neonates. → STOP, flush line, notify. Fatal precipitation risk.

FALLING HGB + JAUNDICE ON CEPHALOSPORIN

Day 7–14. → Drug-induced hemolytic anemia. Coombs test, hold drug.

SEVERE SUNBURN ON DOXYCYCLINE

From normal sun exposure. → STOP, treat burn, switch antibiotic.

HYPOGLYCEMIA ON FQ + SULFONYLUREA

Glucose <70 with sweating/confusion in diabetic elder. → Treat hypoglycemia, hold both, notify.

BREAKTHROUGH SEIZURE ON MEROPENEM/IMIPENEM + VPA

VPA levels drop fast. → Antiepileptic adjustment, switch antibiotic if possible.

PROJECTILE VOMITING IN INFANT ON PO ERYTHROMYCIN

Age <2 weeks. → Pyloric stenosis, urgent surgical consult.

§7 · LOOK-ALIKE COMPARE

Confusing Drugs Side-by-Side

The NCLEX-RN loves to test these comparisons. Pick the right drug for the right scenario.

Ciprofloxacin

Gram-negative · UTI · GI · "Cipro"

BEST FOR

Complicated UTI, pyelonephritis, traveler's diarrhea, anthrax

URINARY CONCENTRATION

High — works for UTI

RENAL DOSING

Required

QT EFFECT

Moderate

STREP PNEUMO COVERAGE

Weak — not first-line for pneumonia

Moxifloxacin

Respiratory · Intra-abdominal · "Avelox"

BEST FOR

Community-acquired pneumonia, complicated skin, intra-abdominal (with metronidazole)

URINARY CONCENTRATION

Low — DO NOT use for UTI

RENAL DOSING

NOT required

QT EFFECT

Highest of all FQs

STREP PNEUMO COVERAGE

Strong — "respiratory FQ"

Ceftriaxone

3rd gen · CNS-penetrating · "Rocephin"

SPECTRUM

Broad gram-negative, crosses BBB

KILLER PITFALL

Calcium-containing IV fluids in neonates = fatal precipitation

PSEUDOMONAS?

NO

RENAL ADJUSTMENT

Usually not required (biliary excretion)

TOP USES

Meningitis, gonorrhea, pyelonephritis

Cefepime

4th gen · Antipseudomonal · "Maxipime"

SPECTRUM

Broad including Pseudomonas, crosses BBB

KILLER PITFALL

Neurotoxicity (encephalopathy/myoclonus) in renal impairment

PSEUDOMONAS?

YES

RENAL ADJUSTMENT

REQUIRED — critical

TOP USES

Febrile neutropenia, HAP, sepsis

Doxycycline

Tetracycline · oral · long half-life

TOP USES

Lyme, Rocky Mtn Spotted Fever, chlamydia, acne, MRSA skin, COPD exac

PREGNANCY?

NO — Category D

AGE LIMIT

≥8 years (tooth staining)

SUN

Severe photosensitivity

DAIRY/ANTACIDS

Azithromycin

Macrolide · short course · atypicals

TOP USES

CAP, pertussis, chlamydia, bronchitis, MAC prophylaxis

PREGNANCY?

Category B — safer alternative

AGE LIMIT

Safe in children

SUN

Not a major issue

KEY DANGER

QT prolongation / torsades

Chelates — separate by 2 hr

DAY 05 · INFOGRAPHIC SUMMARY

Antibiotics *Part I*

NCLEX-RN 2026
18 DRUGS · 7 CLASSES

B-LACTAMS FAMILY

- ▶ **Penicillins** — cell wall; watch anaphylaxis
- ▶ **Cephalosporins (1→5)** — broader by gen; PCN cross 1-2%
- ▶ **Carbapenems** — last resort; seizure risk + VPA
- ▶ All: 15-30 min monitor first dose

DNA DISRUPTORS

- ▶ **Fluoroquinolones (-floxacin)**
- ▶ 8 black-box warnings (T-A-M-P-K-Q-S-N)
- ▶ Cipro = UTI · Levo/Moxi = lungs
- ▶ Moxi ≠ UTI

TOP 3 ADVERSE-EFFECT SIGNALS

- ▶ Watery diarrhea = C. diff workup
- ▶ QTc >500 = hold & replace K+/Mg
- ▶ Sudden tendon pain = stop FQ

SURGICAL PEARL

- ▶ Cefazolin within **60 min** before incision
- ▶ Vancomycin/FQ within **120 min**
- ▶ Re-dose for surgery >4 hr or blood loss >1500 mL

NEXT UP — DAY 6 PREVIEW

- ▶ Aminoglycosides (gentamicin, tobramycin)
- ▶ Vancomycin (trough levels, Red Man)
- ▶ TMP-SMX, nitrofurantoin
- ▶ Metronidazole, linezolid

PROTEIN SYNTHESIS BLOCKERS

- ▶ **Macrolides (-mycin)** — 50S · QT prolong
- ▶ **Tetracyclines (-cycline)** — 30S · sun/dairy/preg
- ▶ **Clindamycin** — 50S · #1 for C. diff

LETHAL COMBINATIONS (MEMORIZE)

- ▶ Ceftriaxone + Calcium (neonates)
- ▶ Pip-tazo + Vancomycin (AKI)
- ▶ Carbapenem + Valproic acid (seizure)
- ▶ FQ + Sulfonylurea (hypoglycemia)
- ▶ FQ + Steroids + elderly (tendon)
- ▶ Macrolide + QT drugs (torsades)

TEACHING PEARLS

- ▶ Finish the entire course — every antibiotic
- ▶ Backup contraception with PCNs/tetracyclines
- ▶ Take FQ/tetracycline 2 hr away from dairy/Fe/Ca/antacids
- ▶ Sun protection on doxy/FQ/TMP-SMX
- ▶ Soap & water (not alcohol) for C. diff

SUFFIX CHEATSHEET

- ▶ **-cillin** = penicillin
- ▶ **cef-/ceph-** = cephalosporin
- ▶ **-penem** = carbapenem
- ▶ **-thromycin/-mycin** = macrolide
- ▶ **-cycline** = tetracycline
- ▶ **-floxacin** = fluoroquinolone