

NGN NCLEX 2026

PHARMACOLOGY

ANTI-INFECTIVES

HIGH-YIELD

Tetracyclines

Broad-spectrum bacteriostatic antibiotics that bind the 30S ribosome to halt bacterial protein synthesis. Famous on the NCLEX for **dairy chelation**, **photosensitivity**, **tooth staining**, and the absolute "never in pregnancy, never under age 8" rule.

CLASS

Bacteriostatic Antibiotic

MECHANISM

Inhibits 30S Ribosome

TIMING

Empty Stomach

PREGNANCY CAT.

D — Contraindicated

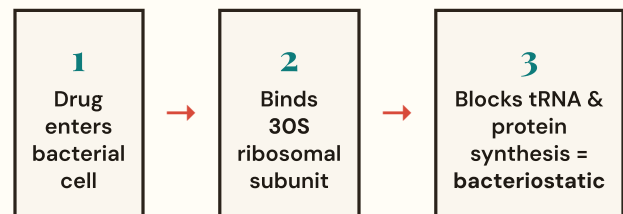
1 Definition & Overview



- ▶ **Broad-spectrum bacteriostatic** antibiotics — stop bacteria from multiplying so immune system can clear infection.
- ▶ Treat **acne, Lyme disease, Rocky Mountain spotted fever, chlamydia, atypical pneumonia (Mycoplasma), H. pylori**, some MRSA.
- ▶ **Key prototypes:** tetracycline, doxycycline, minocycline, demeclocycline, tigecycline.
- ▶ Why they matter: their **food & mineral interactions** are a constant NCLEX target.

💡 **Drug suffix clue:** generic names end in "**-cycline**". If you see it on the exam, think dairy, sun, and pregnancy red flags.

2 How They Work



🚫 **Chelation reaction:** Tetracyclines bind divalent/trivalent cations — **Ca²⁺, Mg²⁺, Fe²⁺, Al³⁺, Zn²⁺**. Result: drug becomes inactive and is never absorbed. This is the basis of the dairy & antacid rule.

3

Adverse Effects — Mild vs Serious



● Mild / Common

- ▶ **GI upset:** nausea, vomiting, diarrhea, anorexia
- ▶ **Photosensitivity** — severe sunburn with even brief sun exposure
- ▶ **Esophageal irritation** & ulceration (if taken without water or lying down)
- ▶ **Stomatitis** / glossitis / oral discomfort
- ▶ **Dizziness, vertigo** (especially minocycline — vestibular toxicity)

🚨 Serious / Red Flag

- ▶ **Permanent tooth discoloration** (yellow-brown-gray) — children <8 yr & fetus
- ▶ **Bone growth suppression** in fetus & young children
- ▶ **Hepatotoxicity** — especially in pregnancy & IV doses
- ▶ **Nephrotoxicity (Fanconi syndrome)** from *expired* tetracycline
- ▶ **Superinfection** — C. difficile, oral/vaginal candidiasis
- ▶ **Pseudotumor cerebri** — ↑ ICP, severe HA, blurred vision, papilledema
- ▶ **Anaphylaxis / Stevens-Johnson** — rare but possible

🚨 **"8 is GREAT" rule:** Tetracyclines are contraindicated in **pregnancy, breastfeeding, and children under 8 years** due to permanent tooth/bone effects.

4

Priority Nursing Actions



- ▶ **ASSESS** for pregnancy & age <8 BEFORE first dose — contraindicated.
- ▶ **ADMINISTER on an empty stomach** — 1 hr before or 2 hr after meals (exception: doxycycline may be given with food if GI upset).
- ▶ **HOLD dairy, antacids, iron, calcium, magnesium** within 2 hours of dose — chelation inactivates drug.
- ▶ **GIVE** with a **full 8 oz glass of water**; keep patient **upright 30 minutes** after dose to prevent esophageal ulcer.
- ▶ **CHECK expiration date** — discard old tetracycline (nephrotoxic).
- ▶ **MONITOR** BUN, creatinine, LFTs, CBC; assess for superinfection.
- ▶ **EDUCATE** sun protection, backup contraception, full course completion.

💡 **ABC priority:** Worsening headache, blurred vision, or vomiting → suspect pseudotumor cerebri → hold drug & notify HCP.

5

Pharmacology — Know These Drugs



Drug	Key Use	NCLEX Pearl
Tetracycline (Sumycin)	Prototype; acne, H. pylori	Must be on empty stomach; classic dairy interaction
Doxycycline (Vibramycin)	Lyme dz, RMSF, chlamydia, malaria prophylaxis	Can take with food; safest renal profile
Minocycline (Minocin)	Acne, MRSA	Causes vestibular toxicity (dizzy/vertigo) & blue-gray skin pigment
Demeclocycline	Off-label for SIADH	Induces nephrogenic DI to treat hyponatremia
Tigecycline (Tygacil)	IV; resistant intra- abdominal & skin infections	Reserved for severe/MDR infections; black-box mortality warning

6 NCLEX Test Traps — Wrong vs Right



✗ WRONG "Take with milk to ease stomach upset."	✓ RIGHT Avoid all dairy. Take with water on empty stomach. Dairy chelates & inactivates the drug.
✗ WRONG Give doxycycline to a pregnant client with chlamydia.	✓ RIGHT Use azithromycin in pregnancy — tetracyclines are Category D and damage fetal teeth/bone.
✗ WRONG Give tetracycline to a 6-year-old for a UTI.	✓ RIGHT Contraindicated < age 8 — permanent tooth staining and skeletal effects.
✗ WRONG "Take with Tums when heartburn flares."	✓ RIGHT Separate antacids, iron, and calcium by at least 2 hours — they bind the drug.
✗ WRONG Spend the afternoon at the pool while on doxycycline.	✓ RIGHT Photosensitivity — wear SPF 30+, long sleeves, hat; avoid tanning beds.
✗ WRONG "I can use the bottle I had left over from last year."	✓ RIGHT Expired tetracycline causes Fanconi-like nephrotoxicity. Discard and request new Rx.
✗ WRONG "Birth control pills will still work normally."	✓ RIGHT Tetracyclines may ↓ OCP effectiveness — use backup barrier method.
✗ WRONG "I'll just lie down right after my dose."	✓ RIGHT Stay upright 30 min & take with full glass of water — prevents esophageal ulceration.

7 Patient & Family Education



Take on Empty Stomach

1 hour before or 2 hours after meals. Exception: doxycycline may be taken with food if GI distress occurs.



No Dairy, Iron, or Antacids

Separate from milk, yogurt, cheese, supplements, and antacids by at least 2 hours.



Full Glass of Water

Take with 8 oz water. Stay upright (sitting or standing) for 30 minutes to prevent esophagitis.



Sun Protection

SPF 30+ sunscreen, hat, long sleeves. Avoid tanning beds. Report severe sunburn.



Backup Contraception

May reduce effectiveness of oral contraceptives — use condoms during therapy and one cycle after.



Finish the Full Course

Complete all doses even if feeling better. Stopping early promotes resistance and relapse.



Check Expiration Date

NEVER take expired tetracycline — can cause kidney damage. Discard old bottles safely.



Call HCP If...

Severe diarrhea (C. diff), severe headache + vision changes, yellow skin/eyes, dark urine, rash, mouth ulcers.

8 Memory Boosters & Mnemonics



🧠 "TETRA" — The 5-letter side effect map

T Teeth staining (kids < 8 / fetus)	E Empty stomach & Esophagitis risk	T Toxic to liver & kidneys (esp. expired)	R Refrain — dairy, sun, pregnancy	A Antacids & iron AVOID
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📅 "8 is GREAT" — The contraindication rule

- ▶ 8 oz water with every dose
- ▶ < 8 years old = NO tetracyclines
- ▶ 8 weeks pregnant (or any week) = NO tetracyclines

☀️ "SUNBURN SIBLINGS" — Photosensitive drug families

- ▶ Sulfonamides • Tetracyclines • Fluoroquinolones • Amiodarone
- ▶ Pattern recognition: any time the question mentions a rash after sun exposure, scan the med list for these.

🥛 "MILK-FREE ZONE"

- ▶ Tetracycline + Dairy = chelation = **no absorption**
- ▶ Pair this with the other "milk-free" drug families: **fluoroquinolones** (cipro), **bisphosphonates**, **levothyroxine**.

9 NCJMM Clinical Judgment Walk-Through



Scenario: A 26-year-old female client is prescribed **doxycycline 100 mg PO BID** for chlamydia. She states, "I take my prenatal vitamin with iron every morning and drink a glass of milk with breakfast. My last period was 7 weeks ago." VS stable. The nurse begins the NGN Clinical Judgment process.

1 Recognize Cues Missed period > 6 weeks, iron supplement, milk with breakfast, prescribed doxycycline.	2 Analyze Cues Possible pregnancy + tetracycline = fetal teeth/bone harm. Iron & milk chelate drug — therapeutic failure.	3 Prioritize Hypotheses #1 Potential pregnancy → drug is contraindicated. #2 Chelation will prevent absorption.	4 Generate Solutions Hold dose, obtain hCG, notify HCP, plan azithromycin alternative if pregnant, separate dairy/iron by 2 hr if not pregnant.	5 Take Action Withhold doxycycline, draw hCG, contact prescriber, educate client on dairy/iron separation pending results.	6 Evaluate Outcomes hCG negative & infection treated → success. hCG positive & alternative regimen prescribed → safe maternal-fetal outcome.
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Priority action (single-best-answer style): "Hold the dose and obtain a pregnancy test." Pregnancy status outranks the chelation issue because tetracyclines in pregnancy = fetal harm.

Student's NGN NCLEX 2026 Visual Study Library — Tetracyclines Reference Sheet

Designed for offline review & print export • Pharmacology • Anti-Infective Module