



Antihypertensives: The Big 3

Labetalol · Hydralazine · Nifedipine — NGN NCLEX High-Yield Review

CARDIAC / PHARM



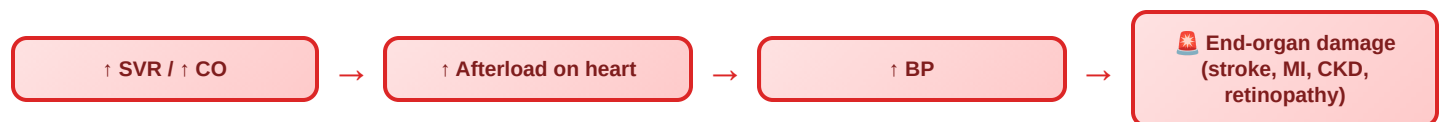
DEFINITION / OVERVIEW

- ▶ Three antihypertensives that **lower BP through different mechanisms** — all act as **vasodilators** in some way, either directly or by blocking receptors that cause vasoconstriction.
- ▶ Commonly tested as **IV options for hypertensive emergency/urgency** and oral maintenance therapy for chronic HTN.
- ▶ Know them cold: they appear in cardiac, maternity (pregnancy HTN/preeclampsia), and pharm NGN items.



PATHOPHYSIOLOGY (SIMPLIFIED)

Hypertension = sustained $\uparrow$ BP due to $\uparrow$ **cardiac output** and/or $\uparrow$ **systemic vascular resistance (SVR)**. Uncontrolled HTN damages vessels $\rightarrow$ target organs (brain, heart, kidneys, eyes).



These 3 drugs interrupt the cycle: Labetalol blocks $\alpha + \beta$ receptors · Hydralazine directly dilates arterioles · Nifedipine blocks Ca^{2+} entry into vascular smooth muscle $\rightarrow$ all lead to $\downarrow$ SVR $\rightarrow$ $\downarrow$ BP.



QUICK COMPARE — THE BIG 3 AT A GLANCE

Labetalol

Mixed α_1 + non-selective β -blocker ("lol")

MOA: Blocks α_1 (vasodilation) + β_1 ($\downarrow$ HR, $\downarrow$ contractility) + β_2

- ▶ **First-line** in preeclampsia / pregnancy HTN
- ▶ IV for hypertensive emergency
- ▶ ⚠ Bradycardia, bronchospasm

Hydralazine

Direct arterial vasodilator

MOA: Relaxes arteriolar smooth muscle $\rightarrow$ $\downarrow$ SVR

- ▶ HTN crisis, preeclampsia, HF
- ▶ ⚠ Reflex tachycardia
- ▶ ⚠ **Lupus-like syndrome (SLE)**

Nifedipine

Dihydropyridine CCB ("pine")

MOA: Blocks L-type Ca^{2+} channels in vessels $\rightarrow$ vasodilation

- ▶ HTN, angina, Raynaud's, preterm labor
- ▶ ⚠ Peripheral edema, flushing
- ▶ ⚠ **No grapefruit!**



SIGNS & SYMPTOMS — ADVERSE EFFECTS TO WATCH

😊 Mild / Expected

- ▶ Dizziness, lightheadedness
- ▶ Headache, flushing
- ▶ Fatigue
- ▶ Mild orthostatic hypotension
- ▶ Peripheral edema (nifedipine)

🚨 Severe / Red Flags — CALL PROVIDER

- ▶ **SBP < 90 mmHg** or HR < 60 (labetalol)
- ▶ Bronchospasm / wheezing (labetalol)
- ▶ Chest pain, angina, dysrhythmia
- ▶ Syncope, severe dizziness on standing
- ▶ Joint pain + rash + fever (hydralazine $\rightarrow$ SLE-like)
- ▶ Sudden severe edema / SOB (HF signs)



LABETALOL

A + B BLOCKER

USES

- ▶ Chronic HTN (PO)
- ▶ **Hypertensive emergency** (IV bolus/drip)
- ▶ **Pregnancy-induced HTN / preeclampsia** (1st line)
- ▶ Post-stroke BP management

KEY SIDE EFFECTS

- ▶ Bradycardia, heart block
- ▶ Orthostatic hypotension
- ▶ **Bronchospasm** (β_2 blockade)
- ▶ Fatigue, dizziness
- ▶ Masks signs of hypoglycemia

PRIORITY NURSING ACTIONS (ABC + SAFETY)

- ▶ **Assess BP + apical HR** before every dose — hold if HR < 60 or SBP < 90–100 mmHg
- ▶ **IV:** keep patient **supine during + 3 hours after** administration (severe orthostatic drop)
- ▶ Monitor continuous ECG during IV administration
- ▶ **NEVER stop abruptly** → rebound HTN, angina, MI (taper over 1–2 weeks)
- ▶ Contraindicated: asthma, 2nd/3rd-degree heart block, cardiogenic shock, severe bradycardia

HYDRALAZINE

ARTERIAL VASODILATOR

USES

- ▶ HTN, HTN crisis (IV)
- ▶ **Preeclampsia / eclampsia**
- ▶ Heart failure (with isosorbide dinitrate, esp. African-American pts)

KEY SIDE EFFECTS

- ▶ **Reflex tachycardia** ❤️
- ▶ Headache, palpitations, flushing
- ▶ Na^+ / H_2O retention → edema
- ▶ 🚑 **Lupus-like syndrome** (SLE): joint pain, rash, fever, positive ANA

PRIORITY NURSING ACTIONS

- ▶ **Monitor BP + HR** — expect reflex tachycardia; report sustained HR > 100
- ▶ Often combined with **β -blocker** (blocks reflex tachy) + **diuretic** (counters fluid retention)
- ▶ Assess for **joint pain, rash, fever, fatigue** → possible drug-induced lupus → notify provider
- ▶ Administer **PO with food** to enhance absorption consistency
- ▶ Teach orthostatic precautions — rise slowly, sit on edge of bed

NIFEDIPINE

DIHYDROPYRIDINE CCB

USES

- ▶ HTN (ER/XL form preferred)
- ▶ Chronic stable angina, vasospastic angina
- ▶ Raynaud's phenomenon
- ▶ **Tocolytic** in preterm labor
- ▶ Preeclampsia

KEY SIDE EFFECTS

- ▶ **Peripheral edema** (ankle swelling) — not HF!
- ▶ Flushing, headache, dizziness
- ▶ Reflex tachycardia
- ▶ **Gingival hyperplasia** 🦷
- ▶ Hypotension (severe with IR form)

PRIORITY NURSING ACTIONS

- ▶ **Monitor BP, HR, peripheral edema** — daily weights; report > 2 lb/day or 5 lb/week gain
- ▶ 🚫 **DO NOT crush / chew ER tablets** — swallow whole (sudden release → profound hypotension)
- ▶ 🚫 **Avoid grapefruit juice** — inhibits CYP3A4 → ↑ drug levels → toxicity/hypotension
- ▶ Encourage **good oral hygiene** + dental follow-up (gum overgrowth)
- ▶ When used as **tocolytic**: monitor uterine contractions, fetal HR, maternal BP

⚠️ NCLEX TEST TRAPS — COMMON MISTAKES

- TRAP #1 — Hydralazine = LUPUS look-alike.** If a patient on hydralazine develops joint pain, rash, fever → think drug-induced SLE, NOT an infection. Notify provider.
- TRAP #2 — Nifedipine edema ≠ heart failure.** Peripheral ankle edema is from direct arteriolar vasodilation, not fluid overload. Don't jump to diuretic — confirm cause.
- TRAP #3 — NEVER stop Labetalol (or any β -blocker) abruptly.** Rebound HTN, angina, MI. Always taper.
- TRAP #4 — Labetalol is the SAFE choice in pregnancy.** ACE-inhibitors and ARBs are teratogenic (category D/X). Labetalol, hydralazine, and nifedipine are pregnancy-appropriate.
- TRAP #5 — Grapefruit + nifedipine = toxic BP crash.** Tested often. Also avoid with other CCBs (amlodipine, felodipine).
- TRAP #6 — Hold parameters:** For labetalol → hold if HR < 60 or SBP < 90–100. For hydralazine/nifedipine → hold if SBP < 90. Always assess FIRST.
- TRAP #7 — β -blocker in asthma.** Labetalol blocks β_2 → bronchospasm. Cardioselective β -blockers (metoprolol, atenolol) are safer when needed.
- TRAP #8 — Priority after giving IV antihypertensive:** Keep the patient **supine** and monitor BP q5–15 min. Don't walk them to the bathroom!

🧠 PATIENT EDUCATION

- ▶ **Rise slowly** from sitting/lying — orthostatic hypotension = fall risk
- ▶ Take BP daily at same time; keep a log to bring to appointments
- ▶ Take **HR before labetalol dose** — call provider if < 60 bpm
- ▶ **Never stop abruptly** — rebound HTN, possible MI
- ▶ Avoid alcohol (potentiates hypotension)
- ▶ **Avoid grapefruit juice** with nifedipine
- ▶ Brush/floss + dental visits every 6 mo (nifedipine gum overgrowth)
- ▶ Report: SOB, chest pain, fainting, irregular HR, > 2 lb overnight weight gain
- ▶ Report unusual joint pain, rash, persistent fever (hydralazine SLE)
- ▶ Low-sodium diet, regular exercise, smoking cessation, weight control
- ▶ Swallow ER tablets whole — do NOT crush/split

🧠 MEMORY BOOSTERS — LOCK IT IN

🔑 DRUG CLASS CLUES (SUFFIXES)

"-olol" = beta-blocker (labetalol) | "-dipine" = dihydropyridine CCB (nifedipine, amlodipine) | Hydralazine = direct vasodilator

👤 LABETALOL = LABOR

LABEtalol is LABor-safe → first-line antihypertensive in pregnancy & preeclampsia.

🐉 HYDRALAZINE = HYDRA-LUPUS

The "HYDRA" monster grows SLE-like symptoms → joint pain + rash + fever + fatigue. Tell provider.

🍊 NIFEDIPINE = "NIFE DIPS BP" + NO GRAPEFRUIT

BP dips hard · ankles swell (edema) · gums grow · **🚫** grapefruit = toxicity.

🎯 3 WAYS TO TAME HTN + SAFETY-FIRST RULE

Block β · Dilate artery · Block Ca^{2+} → all 3 drop SVR → drop BP. Before ANY dose: Assess BP + HR → Check hold parameters → Orthostatic precautions → Monitor response.