

Epidural *Anesthesia*

Regional anesthesia delivered into the epidural space — used for labor analgesia, surgical anesthesia, and acute/chronic pain management. High-yield because hypotension, respiratory depression, and high block are NGN priority complications.

SYSTEM · NEURO / PERIOPERATIVE

DOMAIN · PHARMACOLOGY & SAFETY

POPULATION · OB · SURGICAL · PAIN

PRIORITY · ABC + SYMPATHETIC BLOCK

Source disclosure: This topic was not present in the uploaded reference notes. Content compiled from standard NGN NCLEX 2026 references: Saunders Comprehensive Review for the NCLEX-RN (Silvestri), ATI RN Maternal Newborn & Pharmacology, Lippincott Illustrated Reviews: Pharmacology, ASA Practice Guidelines for Obstetric Anesthesia (2016, reaffirmed), and ASRA (American Society of Regional Anesthesia) practice advisories.

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DEFINITION · OVERVIEW

What Is Epidural Anesthesia?

- **Regional anesthesia** in which a local anesthetic — often combined with an opioid — is injected into the **epidural space** (outside the dura mater) via a catheter, blocking nerve transmission below the insertion level.
- **Common uses:** labor & vaginal delivery, cesarean section, lower abdominal/pelvic/lower-extremity surgery, post-op pain, and chronic pain management.
- **Catheter route:** Typically inserted at **L3–L4** or **L4–L5** (below the L1–L2 spinal cord termination in adults) and threaded for continuous or intermittent dosing.

L3–L4

TYPICAL INSERTION SITE

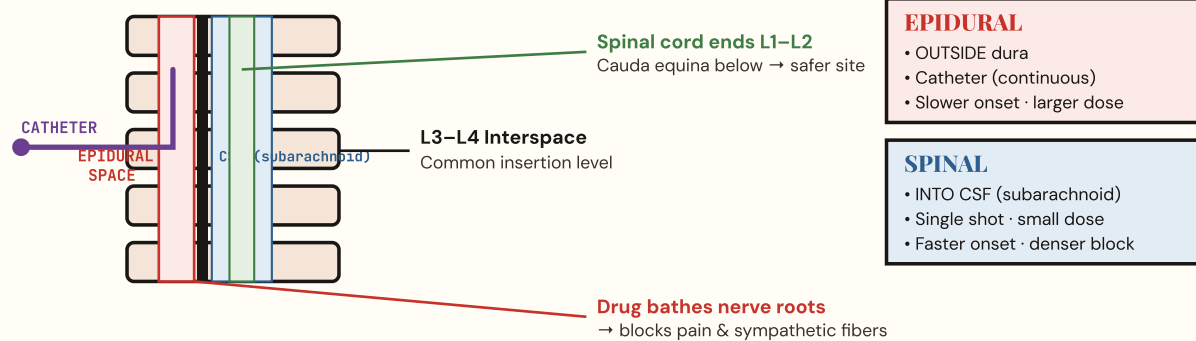
#1

COMPLICATION: HYPOTENSION

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PATHOPHYSIOLOGY • SIMPLIFIED

How an Epidural Works



STEP 01

Catheter placed in epidural space at lumbar level (typically L3–L4).

STEP 02

Local anesthetic ± opioid infused → diffuses across dura.

STEP 03

Sensory + sympathetic nerve roots blocked → loss of pain & vasodilation.

STEP 04

Vasodilation ↓ venous return → **hypotension**; opioid → **resp. depression / pruritus**.

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SIGNS & SYMPTOMS · EXPECTED VS ADVERSE

What You Will See

Expected Effects

- ✓ Loss of pain sensation below catheter level (dermatomal)
- ✓ Sensation of warmth / heaviness in legs
- ✓ Mild motor weakness (less than spinal anesthesia)
- ✓ Mild ↓ in BP (sympathetic blockade, anticipated)
- ✓ Decreased uterine pain in laboring patient — uterine contractions continue
- ✓ Pruritus may occur if opioid is added (expected, not allergic)

Adverse / Complications

- ❗ **Hypotension** — most common; SBP < 100 or ↓ >20% baseline
- ❗ **Respiratory depression** — RR < 12, ↓ SpO₂ (opioid component)
- ❗ **High / total spinal block** — apnea, profound hypotension, paralysis
- ❗ **Local Anesthetic Systemic Toxicity (LAST)** — metallic taste, tinnitus, perioral numbness, seizures, cardiac arrest
- ❗ **Post-Dural Puncture Headache (PDPH)** — positional, worse upright
- ❗ **Epidural hematoma / abscess** — new back pain + neuro deficit
- ❗ Urinary retention · N/V · pruritus · fever · shivering
- ❗ Fetal bradycardia (secondary to maternal hypotension)

Red-Flag Findings · Act Immediately

SBP < 90 mmHg

Position lateral, fluid bolus, vasopressor, O₂, notify anesthesia.

RR < 12 / ↓ SpO₂

Stop opioid infusion, O₂, naloxone, bag-mask if apneic.

Numbness above nipple line

= High block — prep airway, support ventilation, anesthesia STAT.

Tinnitus + metallic taste + seizures

= LAST — stop infusion, ACLS, give 20% lipid emulsion.

New severe back pain + leg weakness

= Epidural hematoma/abscess — surgical emergency, MRI.

Fetal HR < 110, late decels

= Uteroplacental hypoperfusion — left lateral, fluids, ephedrine.

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PRIORITY NURSING INTERVENTIONS · ABC FRAMEWORK

What the Nurse Does

A

Airway

- Assess for high block: numbness above nipples = T4 level
- Keep airway equipment at bedside (bag-mask, intubation kit)
- Have **naloxone** readily available for opioid effect
- Position to protect airway if LOC declines

B

Breathing

- Monitor RR, depth, SpO₂ q15min × 1 hour, then per protocol
- Hold opioid if RR < 12 — notify anesthesia
- Apply O₂ for hypoxia or hypotension
- End-tidal CO₂ monitoring for high-risk patients

C

Circulation

- **Preload** 500–1000 mL NS or LR *before* placement
- BP q5min × 15–30 min after dose, then q15min
- Hypotension → fluid bolus, lateral position, ephedrine/phenylephrine
- OB pts: left lateral tilt to prevent aortocaval compression

S

Safety & Site

- Assess sensory/motor block level (dermatomes, Bromage)
- Bladder scan — straight cath or Foley for retention
- **Bed alarm, fall precautions, no ambulation alone**
- Inspect site for redness, drainage, hematoma; verify dressing intact
- Aspirate catheter before bolus (no blood = not IV; no CSF = not intrathecal)
- Hold anticoagulants per ASRA guidelines around placement & removal

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PHARMACOLOGY • DRUGS DELIVERED & DRUGS AT THE BEDSIDE

Key Medications

DRUG	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Bupivacaine LOCAL ANESTHETIC • AMIDE	Blocks Na ⁺ channels in nerve fibers → loss of sensation/motor.	Hypotension, bradycardia, cardiotoxicity, LAST (seizures, arrest).	Most cardiotoxic — avoid intravascular injection. Aspirate before dose.
Ropivacaine LOCAL ANESTHETIC • AMIDE	Same as bupivacaine; safer cardiac profile, more sensory than motor block.	Hypotension, LAST (less cardiac than bupivacaine).	Preferred for labor — preserves more motor function ("walking epidural").
Lidocaine LOCAL ANESTHETIC • AMIDE	Na ⁺ channel blocker; short-to-intermediate acting.	LAST: metallic taste, tinnitus, perioral numbness, seizures.	Used for surgical anesthesia top-up; rapid onset.
Fentanyl OPIOID ANALGESIC	Binds μ-receptors in dorsal horn → analgesia without dense motor block.	Pruritus, N/V, urinary retention, resp. depression.	Often combined with low-dose local. Watch RR; reverse with naloxone.
Morphine (Duramorph) OPIOID ANALGESIC	μ-receptor agonist; hydrophilic → migrates rostrally over time.	Delayed respiratory depression (up to 24 h) , pruritus, urinary retention.	Monitor respirations q1h × 12 h then q2h × 12 h. Keep naloxone at bedside.
Naloxone (Narcan) OPIOID ANTAGONIST • BEDSIDE	Competitive μ-receptor blocker → reverses opioid effects.	Acute withdrawal, pain rebound, tachycardia, pulmonary edema.	Give for RR < 8 or unresponsive. Titrate; redose — short half-life vs morphine.
Ephedrine / Phenylephrine VASOPRESSOR • BEDSIDE	α/β agonists → vasoconstriction, ↑ BP.	Hypertension, tachycardia (ephedrine), reflex bradycardia (phenylephrine).	First-line for sympathetic-blockade hypotension when fluid bolus fails.
20% Lipid Emulsion (Intralipid) LAST RESCUE • BEDSIDE	"Lipid sink" — binds free local anesthetic, reverses cardiotoxicity.	Fat overload, allergic reaction (rare).	Give per protocol for LAST: 1.5 mL/kg bolus, then 0.25 mL/kg/min infusion.

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NCLEX TEST TRAPS • WRONG VS RIGHT

Where Students Lose Points

△ COMMON WRONG CHOICE

"Place patient in Trendelenburg immediately" for post-epidural hypotension.

VS

✓ CORRECT FIRST ACTION

IV fluid bolus (NS or LR) + **left lateral position** (in OB) + O₂; vasopressor if no response. Trendelenburg is not first-line for sympathetic-block hypotension.

△ CONFUSING

Calling pruritus from epidural opioids an "allergic reaction" and stopping the infusion.

VS

✓ RECOGNIZE

Itching is a **known side effect** of intrathecal/epidural opioids (especially morphine) — treat with diphenhydramine or low-dose naloxone/nalbuphine; do not stop analgesia.

△ WRONG

Treating a positional headache after epidural as the start of an epidural hematoma.

VS

✓ RIGHT

Post-Dural Puncture Headache (PDPH) is **positional** (worse upright, better supine) — treat with hydration, caffeine, analgesics, **blood patch**. Hematoma is **back pain + new neuro deficit** = surgical emergency.

△ WRONG

Confusing epidural with spinal anesthesia on the exam.

VS

✓ RIGHT

Epidural = catheter, *outside* dura, larger drug volumes, slower onset, continuous infusion. **Spinal** = single shot *into* CSF (subarachnoid), small dose, rapid dense block.

△ WRONG

Ambulating an obstetric patient with an epidural to the bathroom because "she feels fine."

VS

✓ RIGHT

Never ambulate alone. Assess motor strength, sensation, orthostatic BP. Use bedpan, straight cath, or Foley for retention. Falls are a top-cited safety event.

△ WRONG

Giving enoxaparin (Lovenox) on schedule the morning of planned epidural removal.

VS

✓ RIGHT

Hold anticoagulants per ASRA guidelines before catheter placement *and* removal — bleeding into the epidural space causes **epidural hematoma** and permanent paralysis. Confirm timing with anesthesia.

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PATIENT & FAMILY EDUCATION

What to Teach Before & After

• Before Placement

- Empty bladder; sign consent.
- You will sit on the edge of the bed or lie on your side, curled like a "C" or "cat back."
- Hold still during insertion; tell the nurse if you feel a shooting pain in your leg.
- Expect a cold cleansing solution and a stinging numbing injection.
- An IV bolus will be given first to keep your BP stable.

• During & After

- Legs may feel heavy, warm, or numb — this is expected.
- **Call for help** before trying to move or get up — risk of falling.
- Tell the nurse about itching, nausea, trouble breathing, or headache.
- You may not feel your bladder is full — report difficulty voiding.
- In labor: contractions continue; you may still feel pressure when it is time to push.

• Warning Signs to Report

- Numbness rising above your chest or trouble breathing.
- Severe back pain or new leg weakness after the catheter is out.
- Headache that is worse when sitting up, better lying down.
- Fever, redness, or drainage at the insertion site.
- Ringing in ears, metallic taste, or feeling like the room is spinning.

• Going Home

- Do not drive for 24 hours after the epidural is removed.
- Drink fluids; rest; mild back tenderness at the site is normal for a few days.
- Call the provider for fever, severe headache, leg weakness, or trouble urinating.

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MEMORY BOOSTERS • MNEMONICS & PATTERNS

Lock It In

HOT BP

Top epidural complications

- H** — Hypotension (#1)
O — Opioid resp. depression
T — Total/high spinal block
B — Back pain (hematoma)
P — PDPH / Pruritus

SAME

First actions for hypotension

- S** — Saline bolus (or LR)
A — Adjust position (left lateral in OB)
M — Medication (ephedrine / phenylephrine)
E — Escalate to anesthesia

LAST

Local Anesthetic Systemic Toxicity

- L** — Lips/tongue numb, metallic taste
A — Auditory: tinnitus, dizzy
S — Seizures
T — Tank crash: bradycardia/arrest
→ Rescue with **20% lipid emulsion**

PDPH

Post-Dural Puncture Headache

- P** — Positional (worse upright)
D — Dura punctured ("wet tap")
P — Plenty of fluids + caffeine
H — Heal with blood patch

EPI

Epidural vs Spinal anchor

- E** — Extra (OUTSIDE dura)
P — Plastic catheter (continuous)
I — Increased volume, slower onset

CATCH

Bedside safety checks

- C** — Catheter site/dressing intact
A — Aspirate before bolus
T — Track sensory level (dermatomes)
C — Check BP, RR, SpO₂
H — Hold anticoagulants (ASRA)

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NGN CLINICAL JUDGMENT MEASUREMENT MODEL • 6-STEP SCENARIO

NCJMM Walk-Through

Patient Scenario • L&D • Active Labor

NGN • CLINICAL JUDGMENT

SCENARIO

A 28-year-old G1P0 woman at 39 weeks gestation receives a lumbar epidural with bupivacaine + fentanyl at L3–L4. She received a 500 mL LR bolus pre-procedure. Fifteen minutes after the initial dose, the nurse finds her pale, diaphoretic, and reporting dizziness and nausea. **BP 78/42, HR 124, RR 22, SpO₂ 96%**. Fetal heart rate tracing now shows late decelerations with baseline 110.

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STEP 1 • RECOGNIZE CUES

What relevant findings stand out?

- BP 78/42 (hypotension) and HR 124 (compensatory tachycardia).
- Diaphoresis, pallor, dizziness, nausea — sympathetic activation + cerebral hypoperfusion.
- Fetal late decelerations + baseline drop to 110 — uteroplacental insufficiency.
- Timing: 15 min after epidural bolus = consistent with sympathetic blockade.

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STEP 2 • ANALYZE CUES

What is the physiology?

Epidural local anesthetic blocks **sympathetic outflow** below the catheter level → vasodilation in lower extremities and splanchnic bed → ↓ venous return → ↓ cardiac output → maternal hypotension. Supine positioning compounds this through **aortocaval compression** by the gravid uterus, reducing uterine perfusion → late decelerations.

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STEP 3 • PRIORITIZE HYPOTHESES

Most likely cause first.

- **Most likely:** Sympathetic-blockade hypotension from the epidural bolus + supine aortocaval compression.
- **Consider:** High block (assess sensory level), intravascular injection / LAST (assess tinnitus, metallic taste, LOC), allergic reaction (rash, bronchospasm), hemorrhage (assess fundus, lochia).
- **Least likely:** Primary cardiac event in a 28-year-old.

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STEP 4 • GENERATE SOLUTIONS

What interventions are appropriate?

- Reposition **left lateral** (or wedge under right hip) to relieve aortocaval compression.
- Open IV LR at wide rate; **500–1000 mL bolus**.
- Administer **O₂ 8–10 L/min via non-rebreather**.
- Have **ephedrine 5–10 mg IV** or **phenylephrine 50–100 mcg IV** ready per protocol.
- Notify anesthesia and obstetric provider STAT.
- Continuous BP, HR, SpO₂ + continuous fetal monitoring.
- Assess sensory level (rule out high block); ask about tinnitus / metallic taste (rule out LAST).

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STEP 5 • TAKE ACTION

Carry out in priority order.

- 1. Turn patient **left lateral** immediately (single fastest intervention).
- 2. Open IV LR to **wide-open bolus**; verify patency.
- 3. Apply **O₂ 10 L/min non-rebreather**.
- 4. Administer **ephedrine 10 mg IV push** per standing order.

- 5. Call **anesthesia + OB provider**; alert charge nurse.
- 6. Reassess BP, HR, sensory level, FHR every 2–3 minutes; document.
- 7. Pause epidural infusion until anesthesia evaluates.

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STEP 6 • EVALUATE OUTCOMES

Has the situation improved?

- **Effective:** BP returns to $\geq 100/60$ within 5–10 min; HR normalizes; symptoms resolve; FHR Category I (baseline 110–160, moderate variability, no late decels); sensory block stable below T6.
- **Ineffective:** BP remains < 90 SBP despite fluids + ephedrine → escalate vasopressor, consider phenylephrine drip, evaluate for high block or LAST, prepare for possible emergent delivery if FHR does not recover.
- Document time of recognition, interventions, response, and notifications.

References: Silvestri – *Saunders Comprehensive Review for the NCLEX-RN* (current ed.); ATI – *RN Maternal Newborn Nursing & RN Pharmacology for Nursing*; Lippincott Illustrated Reviews: Pharmacology; ASA – *Practice Guidelines for Obstetric Anesthesia*; ASRA – *Regional Anesthesia in the Patient Receiving Antithrombotic Therapy*.

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