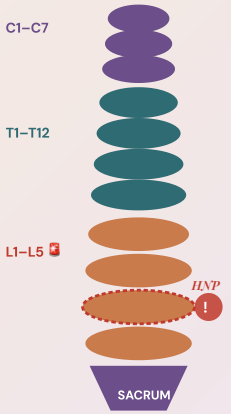
NGN NCLEX 2026 • MUSCULOSKELETAL & NEURO

Spinal Disorders & Back Pain

Comprehensive review: herniated disc, stenosis, spondylolisthesis, cauda equina syndrome, surgical & conservative management, priority nursing care, and patient teaching.

Musculoskeletal | Neurologic | Post-Op Care | Cauda Equina = EMERGENCY



01 Definition & Overview

What it is · why it matters

The Spine

33 vertebrae (7 C · 12 T · 5 L · 5 S fused · 4 Co fused) cushioned by intervertebral discs. Protects the spinal cord — the neural highway.

Back Pain

The #1 reason for ER visits & missed workdays in adults. Most commonly lumbar (L4-L5, L5-S1) — the weight-bearing zone.

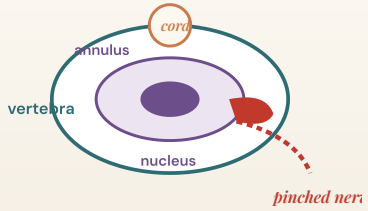
Why It Matters

Some causes are benign (muscle strain); others are emergencies (cauda equina, cord compression) requiring surgery within hours to prevent paralysis.

02 Pathophysiology — Simplified

How a herniated disc causes nerve root pain

1. **Injury or aging** weakens the outer *annulus fibrosus* (the tough outer ring of the disc).
2. The soft inner **nucleus pulposus** bulges or ruptures through the tear → *herniated nucleus pulposus (HNP).*
3. The bulge **compresses the spinal nerve root** (or cord) exiting that level.
4. **Inflammation + mechanical pressure** → radiating pain, numbness, weakness along the nerve distribution (dermatome).
5. If untreated or severe → **motor weakness, loss of reflexes, bowel/bladder dysfunction** = surgical emergency.



Herniated Disc (HNP)

03 Common Spinal Disorders

Distinguishing features for the NCLEX

MOST COMMON CAUSE OF SCIATICA

Herniated Nucleus Pulposus (HNP)

Disc ruptures and compresses a nerve root. Most often lumbar (L4-L5, L5-S1) or cervical (C5-C6, C6-C7).

Hallmark: Sharp radiating pain + numbness/tingling along a dermatome. Worsens with coughing, sneezing, Valsalva. Positive straight-leg raise test.

NARROWING OF THE SPINAL CANAL

Spinal Stenosis

Degenerative narrowing compresses the cord/nerve roots. Classic in older adults (>60).

Hallmark: *Neurogenic claudication* — leg pain with walking/standing, **relieved by leaning forward or sitting** (think: leaning on a shopping cart).

VERTEBRA SLIPS FORWARD

Spondylolisthesis

One vertebra slips forward on the one below, often L5 on S1. Causes mechanical low back pain ± radicular symptoms.

Hallmark: Low back pain worsened by extension, hamstring tightness, palpable "step-off" on exam.

LATERAL CURVATURE OF THE SPINE

Scoliosis

Lateral "S" or "C" curvature ≥10°. Screen in adolescents — forward bend test reveals uneven rib/scapula height.

Treatment: Bracing if curve 25–40°; surgical fusion if >45° or progressive. Monitor respiratory status in severe curves.

ACUTE & CHRONIC LOW BACK PAIN

Lumbosacral Strain / Sprain

The #1 cause of back pain. Usually self-limited (4–6 weeks). Related to lifting, posture, obesity, deconditioning.

Management: Short rest (≤48 hr), NSAIDs, muscle relaxants, heat/ice, *early mobilization*. Prolonged bedrest = harmful.

SURGICAL EMERGENCY

Cauda Equina Syndrome

Compression of the cauda equina nerve bundle below L1-L2. Requires decompression within 24–48 hrs to prevent permanent paralysis.

Red flags: *Saddle anesthesia*, new urinary retention/incontinence, fecal incontinence, bilateral leg weakness. CALL PROVIDER NOW.

04 Signs & Symptoms

Early recognition vs late / severe findings

● Early / Mild

- Dull, aching low back pain (≤ 6 weeks)
- Stiffness after rest or sleep
- Muscle spasm with palpation
- Pain ↑ with bending, twisting, lifting
- Radicular pain down buttock/leg (sciatica)
- Mild paresthesia (numbness, tingling)
- Pain relief with rest & position change

▲ Late / Severe — Escalate Care

- ▲ Radiating pain unrelieved by rest
- ▲ Motor weakness (foot drop, leg giving out)
- ▲ Loss of deep tendon reflexes
- ▲ Muscle atrophy of affected limb
- ▲ Dermatome-specific numbness
- ▲ 🚨 **Saddle anesthesia** (perineal numbness)
- ▲ 🚨 **New bowel/bladder incontinence or retention**

🚨 CAUDA EQUINA SYNDROME — Call Provider Immediately

The NCLEX will hide this in a scenario. Recognizing **any one** of these findings in a back-pain patient means **immediate MRI & surgical consult**.

- Saddle anesthesia (perineum)
- Bowel / bladder incontinence
- Severe progressive radiating pain
- New urinary retention
- Bilateral leg weakness
- Loss of anal sphincter tone

05 Conservative vs Surgical Management

Most patients improve with conservative care within 4–6 weeks

Conservative (First Line)

- **Short rest:** 24–48 hr max, then resume activity
- **Ice** first 24–48 hr → then **heat** for spasm
- Firm mattress, semi-Fowler's with knees flexed
- NSAIDs, acetaminophen, muscle relaxants
- Physical therapy & core-strengthening exercises
- Weight reduction, proper body mechanics
- Epidural steroid injections for radicular pain
- Avoid prolonged bedrest — it WORSENS outcomes

Surgical Options

- **Laminectomy:** remove lamina to decompress the cord/nerve root
- **Discectomy / Microdiscectomy:** remove herniated disc fragment
- **Spinal Fusion:** join 2+ vertebrae with bone graft ± hardware
- **Kyphoplasty/Vertebroplasty:** cement injection for compression fx
- **Indications:** Cauda equina, progressive neuro deficit, intractable pain > 6 wk, bowel/bladder dysfunction
- **Post-op:** Log roll, brace, no BLT (no Bending/Lifting/Twisting)

06 Priority Nursing Interventions

ABCs · Safety · Post-op care · NCLEX prioritization

AIRWAY / NEURO

Neuro checks q2–4 hr post-op

Assess motor strength, sensation, and movement of all extremities. Compare to baseline. **New deficits = notify surgeon immediately.** For cervical spine: watch airway swelling (stridor, hoarseness, dysphagia).

CIRCULATION

Monitor for hemorrhage & DVT

Check dressings for bleeding and *clear drainage* (possible CSF leak → halo sign on gauze). Apply SCDs, encourage leg exercises, administer prophylactic anticoagulation.

SAFETY / MOBILITY

Log-roll — always

Keep spine in alignment. Use a draw sheet with 2–3 staff. Never twist at the waist. Apply back brace *before* getting out of bed. Assist with HOB elevation per order.

SAFETY

No BLT

Teach: **No Bending, Lifting (>5–10 lb), or Twisting** for 4–6 weeks. Place items at waist level. Use a reacher. No driving until cleared (usually 2–4 wk).

PAIN

Multimodal pain control

Scheduled NSAIDs/acetaminophen + PRN opioids. Apply ice to incision. Muscle relaxants for spasm. Reposition q2h. Relaxation, distraction, PCA pump post-op.

ELIMINATION

Monitor bladder & bowel

Post-op urinary retention is common (anesthesia, opioids). Bladder scan if no void in 6–8 hr. Assess bowel sounds — paralytic ileus is possible. Stool softeners to prevent straining.

INFECTION

Assess incision & CSF leak

Check for redness, warmth, drainage, fever. **Clear fluid on dressing = possible CSF leak** (test for glucose / halo sign). Notify provider; keep flat if leak suspected.

POSITIONING

Back-friendly positioning

Supine with small pillow under knees, OR side-lying with pillow between knees. Firm mattress. **Avoid prone position.** HOB ≤ 30° unless ordered otherwise after fusion.

07 Pharmacology

Key drug classes for back pain & spinal disorders

Drug / Class	Mechanism	Key Side Effects	Nursing Considerations
NSAIDs *ibuprofen, naproxen, ketorolac*	Inhibits COX-1/COX-2 → ↓ prostaglandins & inflammation	GI bleeding, renal injury, HTN, platelet inhibition	Give with food. Monitor BUN/creatinine. Avoid in kidney disease, PUD, bleeding disorders. Ketorolac max 5 days.
Acetaminophen *Tylenol*	Central analgesic; minimal anti-inflammatory	Hepatotoxicity (max 4 g/day; 3 g if liver disease)	First-line for mild pain. Check all combo products (Percocet, Norco contain APAP). Avoid with ETOH use.
Muscle relaxants *cyclobenzaprine (Flexeril), methocarbamol, baclofen*	CNS depressant → reduces skeletal muscle spasm	Drowsiness, dizziness, dry mouth, anticholinergic effects	Fall risk — teach safety. No driving. Avoid alcohol & other CNS depressants. Short-term use (2–3 wk).
Opioids *oxycodone, hydrocodone, morphine*	Mu-receptor agonist → blocks pain signaling in CNS	Constipation, sedation, respiratory depression, dependence	Monitor RR (hold if <10–12). Keep naloxone available. Stool softeners (prevent straining). Short-term post-op use.
Corticosteroids *prednisone, methylprednisolone, epidural injection*	Suppresses inflammation around compressed nerves	Hyperglycemia, immunosuppression, osteoporosis, mood changes	Taper — never stop abruptly. Monitor glucose. Take with food. Epidural: limited to 3–4 injections/yr.
Gabapentin / Pregabalin *Neurontin / Lyrica*	Modulates calcium channels → reduces neuropathic pain	Dizziness, drowsiness, peripheral edema, weight gain	Titrate slowly. Fall precautions. Do not stop abruptly (seizure risk). Used for radicular/neuropathic pain.
Enoxaparin (Lovenox) *LMWH — post-op DVT prophylaxis*	Inhibits factor Xa → prevents clot formation	Bleeding, thrombocytopenia (HIT), injection site bruising	SQ in abdomen, **do NOT expel air bubble**, do not rub site. Monitor platelets, H&H, stool for occult blood.

08 Complications to Watch For

Post-operative & disease-related

CSF Leak

Clear drainage on dressing; halo/bullseye sign. Keep flat, notify surgeon.

Hemorrhage / Hematoma

Expanding swelling at site; new weakness; hypotension. Surgical emergency.

Wound Infection

Fever, redness, purulent drainage. Risk of discitis / osteomyelitis.

Neuro Deficit

New weakness, numbness, bowel/bladder change — notify surgeon STAT.

DVT / PE

Unilateral leg swelling, calf pain, sudden SOB. Use SCDs, early ambulation.

Urinary Retention

Common after anesthesia/opioids. Bladder scan; straight cath prn.

Atelectasis / PNA

Incentive spirometer q1h awake, cough & deep breathe, reposition.

Hardware Failure

Sudden severe pain, loss of fusion alignment — requires imaging.

09 NCLEX Test Traps ⚠

Common mistakes & priority confusions

Trap 01

"The patient needs strict bedrest"

Wrong. Prolonged bedrest worsens outcomes — maximum 24–48 hrs, then early mobilization. The correct answer involves **progressive activity**, not rest.

Trap 02

Missing cauda equina

A patient with back pain + **new urinary retention** or **saddle numbness** is NOT a candidate for reassurance. This is a **surgical emergency** — notify provider FIRST.

Trap 03

BLT after fusion

The NCLEX loves distractors where the patient plans to "lift my grandchild," "twist to reach," or "bend to tie shoes." All are **incorrect** — no Bending, Lifting (>5–10 lb), Twisting × 4–6 wk.

Trap 04

Clear drainage ≠ normal

Clear, pale-yellow drainage or a **halo sign** on the dressing after spine surgery = possible **CSF leak**. Keep flat, mark the drainage, call the surgeon — do NOT just reinforce the dressing.

Trap 05

Log roll, not sit up

Post-op fusion patients are **log-rolled** as a unit. Having the patient sit up independently or pull on the side rail = **incorrect** action that risks disrupting fusion.

Trap 06

Stenosis "leaning forward" clue

If the stem says pain is **relieved by leaning over a shopping cart or sitting**, think **spinal stenosis**, not HNP. HNP pain worsens with sitting and bending forward.

Trap 07

Heat before ice? Wrong.

For *acute* strain (first 24–48 hr), use **ice** to reduce inflammation. Heat comes AFTER the acute phase to relieve muscle spasm.

Trap 08

Positive Homans' is not a reliable DVT sign

NCLEX prefers **unilateral calf swelling, warmth, redness, and pain** as DVT indicators. Don't rely on a positive Homans' sign alone.

10 NCJMM Clinical Judgment — In Action

Recognize · Analyze · Prioritize · Evaluate

Scenario: *A 58-year-old male is POD #1 after a lumbar laminectomy and fusion at L4-L5. You enter the room and find him drowsy but oriented. He reports he "hasn't peed since this morning" and that his "bottom feels numb when I sit." Vitals: BP 132/78, HR 92, RR 16, SpO_2 96%, T 99.2°F. The dressing has a small amount of pale, clear drainage with a faint yellow ring.*

01 🔍 Recognize Cues

Concerning: saddle numbness, urinary retention (no void × hrs), halo sign on dressing (possible CSF leak). **Normal-ish:** low-grade temp, stable vitals.

02 🧠 Analyze Cues

Saddle anesthesia + urinary retention post-op suggest **cauda equina from hematoma or cord compression**. Halo sign on dressing = probable **CSF leak / dural tear**. Both are urgent.

03 🎯 Prioritize & Act

1st: Keep patient flat, mark drainage. **2nd:** Notify surgeon STAT. **3rd:** Bladder scan, hold opioids, perform full neuro & motor check. Prep for imaging / OR.

04 ✅ Evaluate

Monitor for improvement in sensation, return of bladder function, and resolution of drainage. Worsening neuro exam = emergent re-operation. Document Q15–30 min until stable.

11 Patient & Family Education

Discharge teaching for long-term spine health

Body Mechanics

- ✓ Bend at knees & hips — NOT the waist
- ✓ Keep objects close to your body
- ✓ Push, don't pull, heavy items
- ✓ Turn with your feet, not your trunk
- ✓ Sleep on side w/ pillow between knees
- ✓ Firm mattress, supportive shoes

Activity & Exercise

- ✓ Walk daily — increase slowly
- ✓ Core-strengthening as cleared by PT
- ✓ Swimming & cycling are spine-friendly
- ✓ No BLT × 4–6 wk post-op
- ✓ Gradual return to driving & work
- ✓ Maintain healthy weight

Brace & Incision Care

- ✓ Wear brace when out of bed (if ordered)
- ✓ Apply brace while lying flat
- ✓ Wear a thin shirt under the brace
- ✓ Keep incision clean & dry
- ✓ No tub baths until cleared; shower OK
- ✓ Do not apply creams to incision

Nutrition & Healing

- ✓ High protein for wound healing
- ✓ Calcium + vitamin D (bone fusion)
- ✓ Adequate fluid (prevents constipation)
- ✓ High-fiber diet
- ✓ Stool softeners (avoid straining)
- ✓ Stop smoking — nicotine impairs fusion

Medication Safety

- ✓ Take pain meds before activity/PT
- ✓ No driving on opioids / muscle relaxants
- ✓ Avoid alcohol with all these meds
- ✓ Do not stop steroids abruptly
- ✓ Watch for GI bleeding with NSAIDs
- ✓ Keep a med schedule/list

🚨 Call the Provider If...

- ✓ New numbness in perineum/groin
- ✓ New bowel or bladder incontinence
- ✓ Inability to urinate > 6–8 hrs
- ✓ Fever > 101°F, chills
- ✓ Wound redness, drainage, opening
- ✓ New or worsening leg weakness

12 Memory Boosters & Mnemonics

Fast-recall tools for exam day

POST-OP PRECAUTIONS

No "BLT"

- **B** — No Bending at the waist
- **L** — No Lifting > 5–10 lb
- **T** — No Twisting the torso

CAUDA EQUINA RED FLAGS

"SPINE"

- **S** — Saddle anesthesia
- **P** — Pee problems (retention / incontinence)
- **I** — Incontinence (bowel)
- **N** — Numbness bilateral lower extremities
- **E** — Escalate — EMERGENCY (call provider)

STENOSIS VS HNP — PAIN POSITION

"Cart lean"

Stenosis: Better *leaning forward* (shopping cart sign)

HNP: Worse with sitting & bending forward

Trick: Standing/walking ↑ stenosis pain; sitting ↑ HNP pain

POST-OP SPINE ASSESSMENT

"CSM × 4"

- **C** — Circulation (color, pulse, cap refill)
- **S** — Sensation (light touch, sharp/dull)
- **M** — Movement (strength, ROM)
- **× 4** — All four extremities, compare L vs R

FIRST 48 HRS OF ACUTE BACK PAIN

"RICE"

- **R** — Rest (short — 24-48 hr only)
- **I** — Ice (first 48 hrs, then heat)
- **C** — Compression (if indicated)
- **E** — Elevation & Early mobilization

CSF LEAK ON DRESSING

"Halo Sign"

Clear/pale yellow fluid with a *yellow ring* around blood on gauze

Action: Keep patient flat, mark drainage, call surgeon

Test: Glucose-positive = CSF (blood is not)