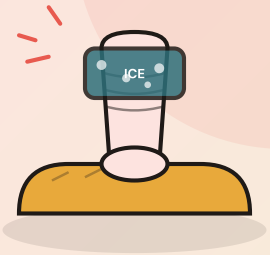
NGN NCLEX 2026 · MUSCULOSKELETAL SYSTEM

Muscle Injuries
Sprains & Strains

The high-yield clinical judgment guide for soft-tissue trauma

ORTHOPEDIC | SOFT TISSUE | RICE / PRICE | PRIORITY CARE



01 Definition & Overview 📖

Ligament Injury

Sprain

BONE → LIGAMENT → BONE

Definition: Stretching or tearing of a **ligament** (the tough band of tissue connecting two bones at a joint).

Common sites: Ankle (#1), knee, wrist, thumb.

Typical MOI: Twisting, rolling, or wrenching of a joint — often an inversion ankle injury.

> 💡 **Sprain = Stretched ligament (both have an "L").**

Muscle / Tendon Injury

Strain

MUSCLE ↔ TENDON → BONE

Definition: Stretching or tearing of a **muscle or tendon** (the fibrous cord that attaches muscle to bone).

Common sites: Lower back, hamstring, quadriceps, calf.

Typical MOI: Overuse, heavy lifting with poor body mechanics, sudden explosive movement.

> 💡 **Strain = Torn muscle/Tendon ("T" for Tendon).**

02 Pathophysiology 🔬

1	2	3	4	5
Forceful Stress	**Fiber Disruption**	**Vascular Injury**	**Inflammatory Response**	**Loss of Function**
Twist, overstretch, or sudden load exceeds tissue capacity	Microscopic to complete tearing of ligament or muscle/tendon fibers	Small blood vessels rupture → local bleeding	Histamine release → vasodilation, fluid shift → edema, warmth, pain	Ecchymosis, swelling, spasm, ↓ ROM, ↓ weight-bearing ability

03 Signs & Symptoms — by Grade

GRADE I

Mild

MICROSCOPIC TEARING

- Mild pain with movement
- Minimal swelling, minimal bruising
- Full / near-full ROM preserved
- Weight-bearing possible
- No joint instability

GRADE II

Moderate

PARTIAL TEAR

- Moderate pain at rest & with motion
- Visible swelling & ecchymosis
- Limited ROM
- Difficulty bearing weight
- Mild-to-moderate joint laxity

GRADE III

Severe

COMPLETE RUPTURE

- Severe pain (may be brief if nerves torn) RED FLAG
- Marked swelling & deep ecchymosis
- Inability to bear weight RED FLAG
- Gross joint instability / deformity
- "Pop" felt at time of injury
- Loss of function of muscle/joint

COMPARTMENT SYNDROME ALERT — Report Immediately

The **6 P's**: **Pain** (unrelieved by opioids, out of proportion), **Pallor**, **Pulselessness**, **Paresthesia**, **Paralysis**, **Poikilothermia** (cool to touch). Pain on *passive stretch* is the earliest sign. This is a surgical emergency — notify HCP STAT; fasciotomy may be required.

04 Priority Nursing Interventions

R.I.C.E.

FIRST 24–72 HOURS · ACUTE INJURY

R — REST
Immobilize & avoid weight-bearing for 24–48 h. Use crutches, splint, or sling as ordered.

I — ICE
Apply cold pack **20 min on / 20 min off** for first 24–48 h. Wrap pack — never direct contact.

C — COMPRESSION
Elastic (ACE) bandage — wrap **distal → proximal**. Snug, not tight. Check CMS every 1–2 h.

E — ELEVATION
Elevate extremity **above heart level** to reduce edema via gravity drainage.

P.R.I.C.E.

UPDATED PROTOCOL · ADDS PROTECTION

P — PROTECTION
Protect the injured area from further injury using a brace, splint, crutches, or taping. Added in current practice before Rest.

HEAT — NOT UNTIL ≥ 48–72 H
Heat causes vasodilation → ↑ bleeding & swelling if applied early. Use **moist heat** after 48–72 h to promote circulation & healing.

Core Nursing Actions

ABC **Assess neurovascular status (CMS)** of affected extremity q1–2 h × first 24 h: color, warmth, movement, sensation, capillary refill <3 sec, pulses.

PRIORITY **Assess pain** using 0–10 scale. Pain *unrelieved by opioids* = compartment syndrome until proven otherwise.

SAFETY **Immobilize** the joint in the position found; do not attempt to straighten a deformed extremity.

MONITOR **Check the bandage**: distal pulses, color, tingling, and swelling beyond the wrap. Loosen if numbness or pallor occurs.

ADMINISTER Give **NSAIDs** (ibuprofen, naproxen) or **acetaminophen** as ordered for pain & inflammation. Opioids only for severe cases.

ASSESS Inspect for **deformity, ecchymosis, crepitus**, or an inability to bear weight — suggests fracture or Grade III injury. X-ray as ordered.

SAFETY Teach **proper crutch use**: weight on hand grips (not axillae) to prevent brachial plexus injury.

EVALUATE Reassess pain, swelling, ROM, and CMS after each intervention. Document response & report no improvement after 24–48 h.

05 Pharmacology 💊

DRUG / CLASS	MECHANISM	SIDE EFFECTS	NURSING CONSIDERATIONS
Ibuprofen · Naproxen NSAID	Inhibits COX-1 & COX-2 → ↓ prostaglandins → ↓ pain & inflammation	GI bleed, gastric ulcer, renal impairment, ↑ BP, ↑ bleeding time	Give **with food**. Monitor renal function & GI bleeding. Avoid in active ulcer, CKD, or late pregnancy.
Acetaminophen NON-OPIOID ANALGESIC	Central COX inhibition → ↓ pain & fever (no anti-inflammatory effect)	**Hepatotoxicity** (max 4 g/day adult; 3 g if liver disease or EtOH use)	Monitor LFTs for long-term use. Avoid alcohol. Antidote: **N-acetylcysteine (Mucomyst)**.
Cyclobenzaprine SKELETAL MUSCLE RELAXANT	Central-acting muscle relaxant → ↓ muscle spasm associated with strains	Drowsiness, dry mouth, dizziness, urinary retention	**Fall precautions**. Avoid driving & alcohol. Short-term use only (2–3 weeks).
Opioids (E.G., HYDROCODONE)	Bind μ-opioid receptors → block pain perception (for severe Grade III pain)	Respiratory depression, constipation, sedation, hypotension	Monitor RR & LOC. Have **naloxone** available. Bowel regimen. Pain *unrelieved by opioids* = emergency.

DRUG / CLASS	MECHANISM	SIDE EFFECTS	NURSING CONSIDERATIONS
Topical diclofenac · menthol TOPICAL ANALGESIC	Local anti-inflammatory / counter-irritant effect	Skin irritation, localized redness	Apply to intact skin only. Wash hands after. Do not use with heating pads (burn risk).

06 NCLEX Test Traps

"Apply heat to reduce the swelling of a fresh ankle sprain"

Heat is the **WRONG** answer in the first 48–72 hours — it worsens bleeding and edema.

~~✗ Warm compress immediately~~

✓ Ice × 20 min, wait 48–72 h for heat

"Keep the leg flat to promote circulation"

Flat = edema pools. The injured extremity must be **elevated above the heart**.

~~✗ Keep the leg flat on the bed~~

✓ Elevate on 2 pillows above heart level

Sprain vs Strain confusion

The NCLEX loves to swap ligament and tendon in the stem. Sprain = **L**igament. Strain = **T**endon/muscle.

~~✗ "A sprain is a torn muscle"~~

✓ "A sprain is a torn ligament"

Increasing pain 6 hours post-injury

New or unrelieved pain is not "normal healing" — it is the earliest sign of **compartment syndrome**.

~~✗ Reassure the client pain is expected~~

✓ Notify HCP; assess 6 P's

Ice pack applied directly to skin

Direct ice = frostbite risk. Always wrap the pack in a thin towel or cloth.

~~✗ Place ice directly on ankle~~

✓ Wrap pack; 20 min on / 20 min off

"The bandage feels tight" — ignore vs act?

Tight bandage + cool, pale, or tingling fingers = neurovascular compromise. **Loosen immediately.**

~~✗ Reassure and leave in place~~

✓ Loosen & reassess CMS

07 NCJMM Clinical Judgment

NEXT-GENERATION NCLEX · CLINICAL JUDGMENT MEASUREMENT MODEL

The 6-Step Thinking Framework

> 📝 ***Scenario:*** *A 22-year-old soccer player presents to the ED 4 hours after rolling their ankle. VS: T 98.6°F, HR 92, BP 128/76, RR 18, O_2 sat 99% RA. The ankle is markedly swollen and ecchymotic; the client rates the pain 8/10 and reports a "popping" sensation at the time of injury. Toes are pink, warm, with cap refill <3 sec; pedal pulse +2. Client is unable to bear weight.*

1 Recognize Cues

"Pop" at injury, inability to bear weight, marked swelling, ecchymosis, pain 8/10 — all suggest a **Grade II–III sprain** or possible fracture.

2 Analyze Cues

Neurovascular status is currently intact (warm, pink, pulses +2). Rule out fracture with X-ray. Pattern fits lateral ankle sprain (inversion injury).

3 Prioritize Hypotheses

#1 Grade II/III ligament injury → #2 rule out fracture → #3 monitor for evolving compartment syndrome with ongoing swelling.

4 Generate Solutions

Initiate **PRICE**, administer NSAID per order, obtain X-ray, immobilize with splint, teach crutch use (non-weight-bearing).

5 Take Action

First: Elevate ankle above heart + apply ice (wrapped, 20 min). **Then:** Compression wrap distal→proximal, NSAID, reassess CMS q1 h.

6 Evaluate Outcomes

Pain ↓ to 3/10 within 1 h ✔ Swelling stabilized ✔ CMS intact ✔ Client demonstrates crutch use ✔ — Interventions effective; continue plan.

08 Complications to Watch ⚠️

Compartment Syndrome

Surgical emergency. 6 P's; pain on passive stretch is earliest. Fasciotomy treatment.

Concurrent Fracture

Suspect with deformity, crepitus, inability to bear any weight. X-ray to rule out.

Chronic Instability

Repeated sprains → recurrent injury, weakness, proprioception loss. Needs rehab.

DVT / VTE

From immobility. Watch for unilateral calf swelling, warmth, pain. Encourage ankle pumps above injury.

09 Patient & Family Education

Home Care & Activity

- ✓ Continue **PRICE** for first 48–72 hours
- ✓ After 72 hours, switch to **moist heat** to increase blood flow & healing
- ✓ Gradually resume activity as pain allows; **do not push through pain**
- ✓ Begin gentle ROM exercises once acute swelling subsides
- ✓ Use crutches / brace until cleared by HCP (weight-bearing as ordered)
- ✓ Anticipate mild-moderate healing: 2–6 weeks; severe: 6–12 weeks

When to Call the Provider

- ✓ Severe pain **unrelieved** by prescribed medication
- ✓ Numbness, tingling, or coolness below the injury
- ✓ Skin color changes: blue, gray, or very pale
- ✓ Inability to move fingers or toes
- ✓ Swelling that worsens despite elevation & ice
- ✓ Fever, redness, or drainage (sign of infection)
- ✓ No improvement after 48–72 h of home treatment

Prevention

- ✓ **Warm up** before exercise; stretch properly
- ✓ Use proper body mechanics — **lift with legs, not back**
- ✓ Wear supportive, well-fitting footwear
- ✓ Increase activity intensity gradually (no more than 10%/week)
- ✓ Strengthen muscles around previously injured joints
- ✓ Use protective gear (ankle braces, taping) for high-risk sports

Medication Teaching

- ✓ **NSAIDs with food** — prevents GI upset & ulcer
- ✓ Do not exceed **4 g acetaminophen/day** (3 g if liver disease)
- ✓ Avoid alcohol with all analgesics — hepatotoxicity risk
- ✓ Muscle relaxants cause drowsiness — no driving / operating machinery
- ✓ Do not combine multiple OTC cold/pain medicines (hidden acetaminophen)
- ✓ Report black/tarry stools (GI bleed from NSAIDs)

10 Memory Boosters & Mnemonics 🧩

PRICE

ACUTE CARE PROTOCOL

- **P** Protection (brace/splint)
- **R** Rest (no weight-bearing)
- **I** Ice (20 on / 20 off × 48 h)
- **C** Compression (distal→proximal)
- **E** Elevation (above heart)

6 P's

COMPARTMENT SYNDROME

- **P** Pain (unrelieved)
- **P** Pallor (pale skin)
- **P** Pulselessness
- **P** Paresthesia (tingling)
- **P** Paralysis
- **P** Poikilothermia (cool)

L · T

SPRAIN VS STRAIN

- **L** Sprain = **L**igament
- **T** Strain = **T**endon / muscle

Sprain = Stretched ligament (2 S's)

Strain = tendon Torn in two (2 T's)

CMS

NEUROVASCULAR CHECK

- **C** Color & Cap Refill (<3 sec)
- **M** Movement of digits
- **S** Sensation (+ Pulses & warmth)

Assess q1–2h × first 24 h

HOT

HEAT RULES

- **H** Hold heat × first 48–72 h
- **O** Only moist heat afterward
- **T** Then — heat promotes healing

Early heat = ↑ bleed & swell

24·48·72

TIMELINE TO REMEMBER

- **24h** Peak swelling & pain
- **48h** Continue ice & PRICE
- **72h** Transition to heat + ROM

Grade III = weeks of rehab

Master the Musculoskeletal System

NGN NCLEX 2026 · High-Yield Clinical Judgment Review · For educational use · Always verify with current facility protocols

STUDY SMART ·