NGN NCLEX 2026 · PHARMACOLOGY · ANTI-INFLAMMATORY

NSAID Comparison
Naproxen · Diclofenac · Meloxicam

Side-by-side pharmacology with indications, onset/peak, nursing care, adverse effects, and patient teaching for the three NCLEX-tested NSAIDs.

Pharmacology | Musculoskeletal | Pain Management | Adult Health

Source Transparency

This topic is not present in the uploaded reference notes for this study library. Content is synthesized from standard NGN NCLEX 2026 references: *Saunders Comprehensive Review for the NCLEX-RN* (Silvestri), *ATI RN Pharmacology Made Easy / Pharmacology for Nursing*, *Lippincott Illustrated Reviews: Pharmacology*, and FDA-approved prescribing information for naproxen (Naprosyn®), diclofenac (Voltaren®, Cataflam®, Pennsaid®), and meloxicam (Mobic®, Anjeso®). Pediatric and pregnancy guidance also reflects current ACR and ACOG/FDA advisories.

01 Definition & Overview

All three drugs are **NSAIDs** (non-steroidal anti-inflammatory drugs) used to treat pain, fever, and inflammation. They differ in **COX selectivity, half-life, route options, and adverse-effect profile** — which is why the NCLEX tests them as a comparison rather than as standalone facts.

Naproxen

Naprosyn® · Aleve® (OTC) · Anaprox®

Class: Non-selective NSAID (propionic acid derivative).
Best known for: Long half-life → BID dosing. Lowest CV risk of the three.

Diclofenac

Voltaren® · Cataflam® · Pennsaid® · Cambia®

Class: Non-selective NSAID (phenylacetic acid), some COX-2 preference.
Best known for: Most route options (oral, topical, IV, IM, ophthalmic, patch). Highest hepatotoxicity & CV risk.

Meloxicam

Mobic® · Vivlodex® · Anjeso® (IV)

Class: Preferential COX-2 inhibitor (oxicam class).
Best known for: Once-daily dosing. Lower GI bleed risk than non-selective NSAIDs (still present, not absent).

02 Pathophysiology — How NSAIDs Work

NSAIDs block the cyclooxygenase (COX) enzymes, which prevents the body from making **prostaglandins**. Prostaglandins drive pain, fever, and inflammation — but they also protect the stomach lining, support kidney perfusion, and regulate platelet function. *That dual role is the source of nearly every NSAID side effect.*

STEP 1

Tissue injury / inflammation

Cell membranes release arachidonic acid.

→

STEP 2

COX-1 & COX-2 enzymes

Convert arachidonic acid into prostaglandins.

→

STEP 3

NSAIDs block COX

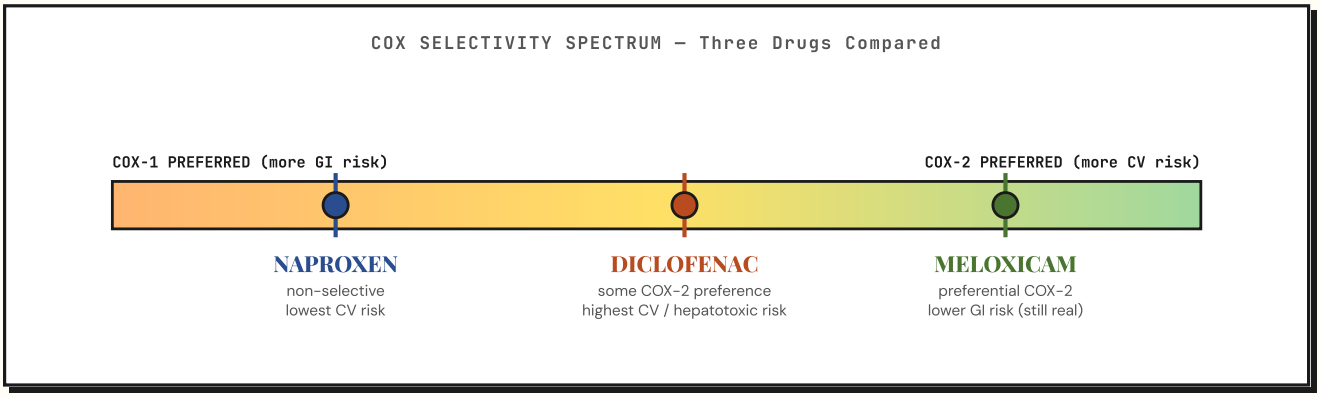
↓ Prostaglandins = ↓ pain, fever, inflammation… *but also ↓ GI, renal, & platelet protection.*

COX-1 ("housekeeping")

- Protects gastric mucosa
- Maintains renal blood flow
- Activates platelets (TXA_2)
- **Blocking COX-1 → ulcers, AKI, bleeding**

COX-2 ("inflammation")

- Made at sites of injury/inflammation
- Drives pain, fever, swelling
- Also affects vascular endothelium (prostacyclin)
- **Selective COX-2 block → ↑ CV thrombotic risk**



03 Pharmacology Comparison Table

	NAPROXEN Naprosyn / Aleve	DICLOFENAC Voltaren / Cataflam	MELOXICAM Mobic / Anjeso
CLASS	Non-selective NSAID (propionic acid)	Non-selective NSAID (phenylacetic acid; mild COX-2 preference)	Preferential COX-2 inhibitor (oxicam)
FDA INDICATIONS	Mild–moderate pain, dysmenorrhea, fever, OA, RA, JIA, ankylosing spondylitis, acute gout, tendonitis/bursitis	OA, RA, ankylosing spondylitis, acute pain, dysmenorrhea, acute migraine (Cambia® powder), actinic keratosis (topical Solaraze®), ophthalmic post-op inflammation	OA, RA, juvenile RA (≥2 yrs). Anjeso® IV for moderate-severe pain. *Not for acute pain at oral dose — slow peak.*
ROUTES	PO tablet, PO suspension, ER tablet. *OTC at low dose (220 mg).*	**Most versatile:** PO, IV, IM, topical gel/solution, transdermal patch, ophthalmic drop, oral powder (migraine)	PO tablet, PO capsule, PO oral suspension, IV (Anjeso®)
ONSET (ORAL)	~30–60 min (analgesic); 1–2 wk for full anti-inflammatory effect	~30 min (IR tablet); 10–20 min (oral powder Cambia® for migraine)	~30–60 min (analgesic); days–weeks for full anti-inflammatory effect
PEAK	2–4 hours	1–2 hours (IR)	4–5 hours (some sources cite up to 9–11 hr)
HALF-LIFE	**12–17 hr** → BID dosing	1–2 hr (oral) → multiple daily doses needed	**15–20 hr** → once-daily dosing
TYPICAL ADULT DOSE	250–500 mg PO BID (Rx); 220 mg q8–12h (OTC). Max 1500 mg/day short-term.	50 mg PO TID–QID (IR); topical gel 2–4 g to affected joint QID. Cambia 50 mg PO × 1 for migraine.	7.5–15 mg PO daily. Anjeso® 30 mg IV daily.
GI BLEED RISK	Moderate (lower than ibuprofen at equal doses in some studies)	Moderate–high	**Lower** at therapeutic dose (COX-2 preference) — but rises at 15 mg/day & with long-term use
CV THROMBOTIC RISK	**Lowest** of the three (often called the "least cardiotoxic" non-aspirin NSAID)	**Highest** — risk comparable to COX-2 selective agents	Elevated (preferential COX-2 effect)
HEPATIC RISK	Mild ↑ LFTs uncommon	**Highest** — black-box-level hepatotoxicity warning; monitor LFTs at baseline, 4–8 wk, then periodically	Low — rare elevations
RENAL RISK	Yes — AKI, fluid retention	Yes — AKI, fluid retention	Yes — AKI, fluid retention (no NSAID is "kidney-safe")
PREGNANCY	⚠ **All three:** Avoid at **≥ 20 weeks gestation** (fetal renal injury, oligohydramnios) and **completely contraindicated ≥ 30 weeks** (premature closure of fetal ductus arteriosus). FDA labeling change applies to all NSAIDs.		

	NAPROXEN Naprosyn / Aleve	DICLOFENAC Voltaren / Cataflam	MELOXICAM Mobic / Anjeso
PEDIATRICS	JIA ≥ 2 yrs (suspension available)	Limited pediatric use; case-by-case	JIA ≥ 2 yrs (oral suspension Vivlodex®/Mobic®)
KEY DRUG INTERACTIONS	Anticoagulants, lithium (↑ levels), methotrexate (↑ toxicity), ACEi/ARB/diuretics (↓ effect, ↑ AKI), SSRIs (↑ bleed)	Same as naproxen + warfarin (significant) + cyclosporine (↑ nephro/hepatotoxic) + topical: avoid sunscreens/cosmetics on site	Same NSAID class interactions; aspirin reduces COX-2 selectivity advantage (avoid concurrent ASA except low-dose cardioprotective)

⚡ **NCLEX SIGNAL:** If the question stem mentions *cardiac history* or recent *CABG* → **all NSAIDs are contraindicated** in the perioperative CABG period (black-box). If the stem mentions *liver disease* → diclofenac is the worst pick. If the stem mentions *GI ulcer history* → meloxicam is the safest of the three (still requires PPI cover).

04 Signs & Symptoms of NSAID Adverse Effects

🟡 Mild / Early

- Dyspepsia, heartburn, nausea
- Mild epigastric discomfort
- Headache, dizziness, drowsiness
- Mild peripheral edema (ankles)
- Tinnitus (especially naproxen at high dose)
- Mild ↑ BP (especially diclofenac)
- Photosensitivity (topical diclofenac)

🔴 Severe / Late — RED FLAGS 🚨

- **GI bleed:** coffee-ground emesis, melena (black tarry stool), hematemesis, hypotension, tachycardia
- **Renal injury:** ↓ urine output, ↑ creatinine/BUN, weight gain, generalized edema
- **CV event:** chest pain, dyspnea, focal neuro deficits (MI/stroke)
- **Hepatotoxicity (diclofenac ★):** jaundice, RUQ pain, dark urine, pale stool, ↑ AST/ALT
- **Anaphylaxis:** urticaria, wheeze, angioedema — esp. "aspirin triad" (asthma + nasal polyps + NSAID sensitivity)
- **Stevens-Johnson / TEN:** rare, blistering skin rash + mucosal involvement
- **Aseptic meningitis:** rare; ↑ risk in lupus patients

🚨 **STOP-THE-DRUG FINDINGS**

Black tarry stool · coffee-ground emesis · jaundice or RUQ pain · chest pain or new focal weakness · urine output < 30 mL/hr · weight gain > 2 lb/day · blistering rash. Any of these = hold the NSAID and notify the provider.

05 Priority Nursing Interventions (ABCS Framework)

A
AIRWAY

- → Assess for wheeze / angioedema (aspirin-triad asthma)
- → Stop drug & notify HCP if bronchospasm
- → Have epinephrine accessible if anaphylaxis history

B
BLEEDING

- → Check stool color / Hgb / Hct / platelets
- → Monitor for melena & coffee-ground emesis
- → Hold NSAID if Hgb drops > 2 g/dL
- → Co-prescribe PPI if high GI risk

C
CARDIAC / RENAL

- → Baseline & periodic BP, weight, edema check
- → Monitor BUN, creatinine, urine output
- → Avoid in recent CABG (black-box)
- → Diclofenac → add baseline & q4–8wk LFTs

S
SAFETY / TEACHING

- → Take WITH food/milk/full glass water
- → Stay upright 30 min after dose
- → Pregnancy screen ≥ 20 wks gestation
- → Reconcile other NSAIDs / ASA / anticoagulants

★ **Highest priority assessment for ALL NSAIDs:** Hgb/Hct + creatinine + BP + stool color. These four catch the three big NCLEX-tested adverse events (GI bleed, AKI, hypertension/heart failure exacerbation).

06 NCLEX Test Traps ⚠

✗ WRONG ANSWER PATTERN

"Meloxicam is COX-2 selective so it can't cause GI bleed."

✓ CORRECT THINKING

Meloxicam is **preferential**, not absolutely selective. Higher doses (15 mg) lose selectivity. Still monitor for GI bleed; still consider PPI in high-risk patients.

✗ WRONG ANSWER PATTERN

"Topical diclofenac is just a rub — no systemic effects to worry about."

✓ CORRECT THINKING

Topical diclofenac has lower systemic absorption but the FDA carries the **same black-box CV/GI/hepatic warnings**. Wash hands after applying, no heating pads over site, avoid sun exposure to treated skin.

✗ WRONG ANSWER PATTERN

"Naproxen is OTC, so it's safe to take with my warfarin."

✓ CORRECT THINKING

OTC ≠ safe with anticoagulants. NSAIDs ↑ bleed risk by inhibiting platelets AND irritating GI mucosa. Always reconcile OTC NSAIDs at every visit.

✗ WRONG ANSWER PATTERN

"The patient is at 28 weeks pregnant with low back pain — diclofenac gel should be fine."

✓ CORRECT THINKING

Avoid all NSAIDs ≥ 20 weeks gestation (fetal renal injury, oligohydramnios) and they are **contraindicated ≥ 30 weeks** (premature ductus arteriosus closure). Recommend acetaminophen and non-pharmacologic measures.

✗ WRONG ANSWER PATTERN

"Patient is on methotrexate for RA — adding meloxicam will help the joint pain."

✓ CORRECT THINKING

NSAIDs **↑ methotrexate toxicity** by reducing renal clearance. Same caution applies to lithium. Always check current medication list before adding any NSAID.

✗ WRONG ANSWER PATTERN

"Patient took meloxicam this morning and has acute migraine — give another dose now."

✓ CORRECT THINKING

Meloxicam has a **slow peak (~4–5 hr)** and is **not** for acute pain. For acute migraine, the NSAID of choice in this trio is **diclofenac oral powder (Cambia®)** — onset ~10–20 min.

07 Patient & Family Education

General to ALL three NSAIDs

- ✓ Take with food, milk, or a full glass of water
- ✓ Stay upright for at least 30 minutes after dose
- ✓ Do not combine with other NSAIDs or aspirin without provider approval
- ✓ Limit or avoid alcohol — increases GI bleed risk
- ✓ Report black tarry stool, coffee-ground vomit, easy bruising
- ✓ Report decreased urine, swelling of ankles, sudden weight gain
- ✓ Report chest pain, sudden weakness, slurred speech (MI/stroke)
- ✓ Stop and call provider if blistering rash or yellow skin/eyes

Naproxen-specific

- ✓ OTC labeled "Aleve" — confirm patient isn't double-dosing with prescription
- ✓ BID schedule — set reminders; do not catch up missed doses
- ✓ Tinnitus may signal accumulation — report ringing in ears
- ✓ Maximum 1500 mg/day and only short-term at that dose

Diclofenac-specific

- ✓ Report yellowing skin, dark urine, RUQ pain (hepatotoxicity)
- ✓ Topical gel: wash hands after, do not cover with occlusive dressing or heating pad, avoid sunlight to treated area
- ✓ Topical gel: do not apply to broken/infected skin or near eyes/mouth
- ✓ Cambia® powder: dissolve in 1–2 oz water (NOT juice or other liquids)
- ✓ Allow ≥ 30 min between topical diclofenac and sunscreen/cosmetics on same area

Meloxicam-specific

- ✓ Take at the same time each day (once-daily dosing)
- ✓ Does NOT work fast — not for acute pain or fever in the moment
- ✓ Does NOT replace DMARDs for rheumatoid arthritis — adjunct only
- ✓ Avoid aspirin (cancels COX-2 selectivity advantage) unless cardiac-dose ASA is prescribed and reconciled with provider

08 Memory Boosters & Mnemonics

N · S · A · I · D

The five things to monitor on every NSAID patient:

N — **N**ephron (renal): BUN, creatinine, urine output, weight

S — **S**tomach: melena, coffee-ground emesis, Hgb/Hct

A — **A**sthma & allergy: aspirin-triad sensitivity, urticaria

I — **I**NR / bleeding: anticoagulant interactions

D — **D**uctus arteriosus (pregnancy): avoid ≥ 20 wks, contraindicated ≥ 30 wks

"BID-NAP"

NAProxen is dosed **BID** because its long half-life (~14 hr) covers a 12-hour interval.

"DICLO = DICE-Y LIVER"

DICLOfenac is the riskiest NSAID for the **liver and the heart**. Picture rolling DICE every dose — monitor LFTs and CV status.

"MEL-O-DAY"

MELoxicam = **ONCE a DAY**. Long half-life (~20 hr). Slow peak means it won't help acute pain — think of it as a slow, steady melody, not a sprint.

"BEERS LIST"

All three NSAIDs are on the **Beers Criteria** for potentially inappropriate medications in **older adults** — increased risk of GI bleed, AKI, and heart failure. Use the lowest effective dose for the shortest duration. *The NCLEX favors acetaminophen for older adults with mild OA pain.*

09 NGN Clinical Judgment Scenario (NCJMM)

UNFOLDING CASE

A 68-year-old female with a history of osteoarthritis (both knees), hypertension, GERD, and CKD stage 2 presents to the clinic for follow-up. She reports increasing knee pain over the past month. She has been taking **OTC naproxen 220 mg every 8 hours** "around the clock" and her neighbor recently gave her **diclofenac gel** to use on her knees twice daily. Today: BP 162/94, HR 88, weight up 4 lb in 2 weeks, +1 ankle edema, hgb 10.2 (was 12.4 three months ago), creatinine 1.6 (baseline 1.1). She mentions her stools have been "darker than usual."

STEP 1 · RECOGNIZE CUES

What stands out?

↑ BP, weight gain, peripheral edema, hgb drop 2.2 g/dL, creatinine 0.5 ↑ from baseline, dark stool, polypharmacy of two NSAIDs (oral + topical), pre-existing CKD and GERD.

STEP 2 · ANALYZE CUES

What's happening?

Patient is showing **three NSAID-related adverse effects converging**: (1) GI bleed (Hgb drop, dark stool) from chronic oral naproxen + GERD history, (2) AKI on CKD (↑ creatinine, oliguric signs) from cumulative NSAID exposure (oral + topical adds up), (3) HTN exacerbation + fluid retention from prostaglandin-mediated renal effects. **Topical diclofenac is NOT a free pass** — systemic absorption adds to total NSAID burden.

STEP 3 · PRIORITIZE HYPOTHESES

What's most urgent?

Highest priority: Active GI bleed (Hgb 10.2, dark stool) — can deteriorate quickly. **Second:** Acute kidney injury on baseline CKD. **Third:** Uncontrolled hypertension contributing to fluid overload. All are driven by the same root cause: **NSAID accumulation**.

STEP 4 · GENERATE SOLUTIONS

What should be done?

(a) **Stop both NSAIDs immediately** — oral naproxen AND topical diclofenac; (b) Notify HCP; (c) Send CBC, BMP, type & screen, stool guaiac; (d) Establish IV access, hold antihypertensive that could worsen renal perfusion until volume status known; (e) Consider switch to **acetaminophen scheduled** for OA pain; (f) Refer to PT for non-pharm joint care; (g) GI referral for endoscopy if bleed confirmed.

STEP 5 · TAKE ACTION

What does the nurse do first?

1st: Hold both NSAIDs and notify provider · **2nd:** Draw labs and obtain orthostatic VS · **3rd:** Establish IV access with NS at maintenance rate · **4th:** Initiate fall precautions (anemia + orthostatics) · **5th:** Educate patient/family on NSAID risks and that topical formulations also count.

STEP 6 · EVALUATE OUTCOMES

How do we know it's working?

Expected within 48–72 hours: stool color normalizes, hgb stabilizes, creatinine trends back toward baseline 1.1, BP improves, weight decreases as fluid shifts off. Patient verbalizes that **topical NSAIDs are not "free"** and identifies acetaminophen as her new first-line pain agent. If no improvement → escalate workup for non-NSAID GI source.

10 One-Look Summary

NAPROXEN

BID · non-selective · lowest CV risk · long half-life · watch tinnitus & GI bleed · OTC formulation = reconciliation trap

DICLOFENAC

Most route options · highest CV & hepatic risk · monitor LFTs · topical & oral are additive · Cambia® is the fast one for migraine

MELOXICAM

Once daily · COX-2 preferential · lower GI risk (not zero) · slow onset = NOT for acute pain · adjunct in RA only

★ FOR EVERY NSAID PATIENT: BP · Hgb/Hct · Creatinine · Stool color · Pregnancy status · Med reconciliation ★