

NGN NCLEX 2026 • MUSCULOSKELETAL • METABOLIC

Gout & Hyperuricemia

INFLAMMATORY ARTHRITIS

CRYSTAL DISEASE

DIET-SENSITIVE

HIGH-YIELD: PHARM + DIET

"The disease of kings" — sudden, severe, classically the great toe

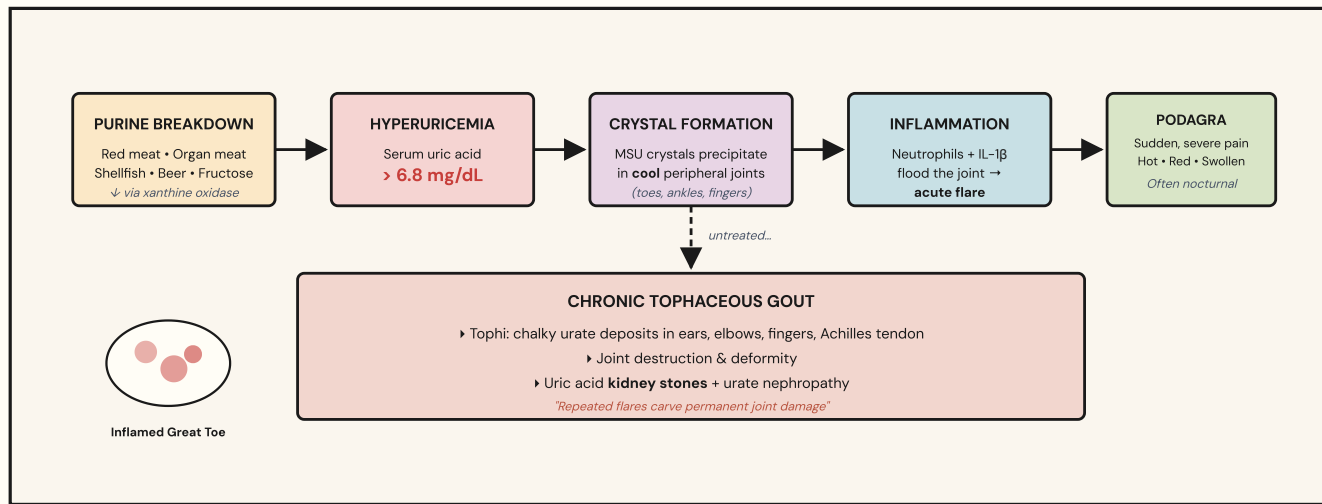
01 ^{Nº} Definition & Overview

- ◆ Gout is a **metabolic disorder** caused by **hyperuricemia** (serum uric acid > 6.8 mg/dL) that leads to deposition of **monosodium urate (MSU) crystals** in joints & soft tissue.
- ◆ Most common **inflammatory arthritis** in adults. Classic site = **1st metatarsophalangeal joint (great toe)** = "podagra."
- ◆ Men > women until menopause. Strongly tied to **diet, alcohol, obesity, and certain medications** (thiazides, loop diuretics, low-dose ASA).

Why Uric Acid Rises

- ◆ **Overproduction** — high purine intake, tumor lysis, psoriasis
- ◆ **Underexcretion** — CKD, diuretics, low-dose aspirin, dehydration
- ◆ Most patients are **underexcretors** (~90%)

02 ^{Nº} Pathophysiology



Key Diagnostic

- ◆ **Joint aspiration (arthrocentesis) = GOLD STANDARD** — reveals needle-shaped, negatively birefringent MSU crystals
- ◆ Serum uric acid > 6.8 mg/dL (*may be normal during acute attack — don't be fooled*)
- ◆ Elevated ESR, CRP, WBC; 24-hour urine uric acid (helps classify over- vs. underexcretor)

03

Nº Signs & Symptoms



Acute Flare (Early)

- ◆ **Sudden onset** — often wakes patient at night
- ◆ **Excruciating pain** (10/10) in a single joint
- ◆ **Podagra** — 1st MTP (great toe) most common
- ◆ Joint is **hot, red, swollen, exquisitely tender**
- ◆ **Cannot tolerate even a bedsheet** on the joint
- ◆ Low-grade fever & malaise possible
- ◆ Attack typically resolves in 3–10 days even without treatment



Chronic / Tophaceous (Late)

- ◆ **Tophi** — hard, chalky, painless urate deposits under skin
- ◆ Common tophi sites: **helix of ear, olecranon, Achilles, fingers**
- ◆ Persistent joint pain & deformity
- ◆ Decreased range of motion
- ◆ Polyarticular involvement (multiple joints)
- ◆ **Uric acid kidney stones** (radiolucent — won't show on plain x-ray)
- ◆ Chronic kidney disease from urate nephropathy



RED FLAG — DON'T MISS

Hot, swollen joint + FEVER = rule out SEPTIC ARTHRITIS. Septic arthritis can present identically to acute gout and is a surgical/IV-antibiotic emergency. Joint aspiration is mandatory. Also watch for: **oliguria/anuria** (urate nephropathy), **severe diarrhea on colchicine** (toxicity — stop drug), and **any new rash on allopurinol** (possible Stevens-Johnson syndrome).

04

Nº Priority Nursing Interventions



Acute Flare

- ◆ **Assess** pain (PQRST), joint appearance, ROM, vital signs
- ◆ **Rest & elevate** the affected joint
- ◆ **Apply ICE / cold packs** 20 min q2h — **never heat**
- ◆ **Bed cradle** — keep linens off the tender joint
- ◆ **Administer NSAIDs, colchicine, or corticosteroids** as ordered
- ◆ **Push fluids 2–3 L/day** (if not contraindicated) to prevent stones
- ◆ Monitor renal function (BUN, creatinine, urine output)
- ◆ Avoid weight-bearing on affected joint until inflammation resolves



Chronic / Long-Term

- ◆ Reinforce **medication adherence** with urate-lowering therapy (ULT) — *continue even when asymptomatic*
- ◆ Promote **gradual weight loss** (rapid loss can trigger a flare)
- ◆ Educate on **low-purine diet** & alcohol avoidance
- ◆ Monitor **serum uric acid** (goal < 6 mg/dL)
- ◆ Review medication list — **flag thiazides, loop diuretics, low-dose ASA, niacin**
- ◆ Encourage **hydration** daily (≥ 8 glasses water)
- ◆ Assess tophi for ulceration / infection
- ◆ Refer to dietitian + rheumatology

05 *Nº* Pharmacology

Two phases of treatment: ① *Stop the fire* (acute) — NSAIDs, colchicine, steroids. ② *Prevent the next fire* (chronic) — urate-lowering therapy (allopurinol, febuxostat, probenecid).

Drug	Mechanism	Key Side Effects	Nursing Considerations
Indomethacin / Naproxen / Ibuprofen NSAIDS — ACUTE	Inhibit COX → ↓ prostaglandins → ↓ inflammation	GI bleeding, gastric ulcer, nephrotoxicity, ↑ BP, fluid retention	Give with food . Avoid in CKD, PUD, anticoagulant use. Monitor renal function.
Colchicine ANTI-INFLAMMATORY — ACUTE	Inhibits neutrophil migration into joint	Severe N/V/D , abdominal pain, bone marrow suppression, neuropathy	Most effective within 24 hr of attack onset . Stop if diarrhea develops = toxicity sign . Reduce dose in CKD/liver disease.
Prednisone / Methylprednisolone CORTICOSTEROID — ACUTE	Broad anti- inflammatory	Hyperglycemia, ↑ infection risk, ↑ BP, osteoporosis, mood changes	Used if NSAIDs/colchicine contraindicated. Can be intra- articular. Monitor glucose (esp. diabetics). Taper — never stop abruptly.
Allopurinol (Zyloprim) XANTHINE OXIDASE INHIBITOR — CHRONIC	↓ uric acid <i>production</i>	Rash → Stevens-Johnson syndrome 🚑, hepatotoxicity, GI upset, bone marrow suppression	Do NOT start during acute flare (can worsen it). Take with food + ≥ 8 glasses H ₂ O. Report any rash immediately . Monitor LFTs, CBC.
Febuxostat (Uloric) XANTHINE OXIDASE INHIBITOR — CHRONIC	↓ uric acid <i>production</i> (alternative to allopurinol)	LFT elevation, rash, ↑ CV death risk (Black Box)	Use when allopurinol contraindicated. Monitor LFTs & cardiac status. Not for use in active CV disease.
Probenecid URICOSURIC — CHRONIC	↑ renal <i>excretion</i> of uric acid	Kidney stones, GI upset, rash, headache	Push fluids (≥ 2 L/day) to prevent stones. Avoid in CKD & stone history. Avoid ASA (cancels effect). Not given during acute flare.
Pegloticase (Krystexxa) RECOMBINANT URICASE — IV	Converts uric acid → allantoin (excreted)	Infusion reaction, anaphylaxis, gout flare on initiation, hemolysis in G6PD deficiency	For refractory chronic gout only. Screen for G6PD before starting . Pre-medicate with antihistamine + steroid.

06 ^{Nº} NCLEX Test Traps ⚠

✗ WRONG ANSWER

Apply a **warm compress** to the inflamed great toe to ↑ circulation.

✓ RIGHT ANSWER

Apply **ICE / cold packs** during an acute flare. Cold ↓ inflammation; heat will *worsen* the attack.

✗ WRONG ANSWER

Start **allopurinol immediately** when a patient presents with an acute gout flare.

✓ RIGHT ANSWER

Treat the flare first with NSAIDs / colchicine / steroids. **Initiating ULT during a flare can prolong or worsen the attack.** Start ULT 2–4 weeks after flare resolves.

✗ WRONG ANSWER

Tell patient to **restrict all protein** from the diet.

✓ RIGHT ANSWER

Restrict only **high-purine foods** (red & organ meats, shellfish, beer). **Low-fat dairy & plant proteins are actually protective.**

✗ WRONG ANSWER

Tuck the bed linens tightly around the patient's feet for comfort.

✓ RIGHT ANSWER

Use a **bed cradle** — the inflamed joint is so tender the patient cannot tolerate even a sheet's weight.

✗ WRONG ANSWER

Restrict fluids to prevent swelling in the affected joint.

✓ RIGHT ANSWER

Push fluids 2–3 L/day to flush uric acid & prevent kidney stones (unless contraindicated by HF or CKD).

✗ WRONG ANSWER

Continue colchicine even if the patient develops severe diarrhea.

✓ RIGHT ANSWER

Severe diarrhea = colchicine toxicity → STOP the drug and notify HCP. This is an early warning of dangerous bone marrow effects.

✗ WRONG ANSWER

Reassure a patient on allopurinol that a new skin rash is just a mild side effect.

✓ RIGHT ANSWER

Any new rash with allopurinol → STOP & notify HCP immediately. It may be early **Stevens-Johnson syndrome**.

07

Nº Patient & Family Education

AVOID

- ◆ **Organ meats** (liver, kidney, sweetbreads)
- ◆ Red meat (beef, lamb, pork)
- ◆ Shellfish — *anchovies, sardines, mussels, scallops*
- ◆ **Beer & hard liquor** (beer = worst)
- ◆ High-fructose corn syrup & sugary sodas
- ◆ Yeast, gravies, meat broths
- ◆ Aspirin / low-dose ASA (↑ uric acid)
- ◆ Crash dieting / fasting

ENCOURAGE

- ◆ **Cherries & tart cherry juice** — shown to ↓ flares
- ◆ **Low-fat dairy** (yogurt, milk) — protective
- ◆ Water — 8–10 glasses/day
- ◆ Plant proteins (beans, lentils in moderation)
- ◆ Whole grains & complex carbs
- ◆ Coffee in moderation (may ↓ uric acid)
- ◆ Gradual weight loss
- ◆ Acetaminophen for general pain (instead of ASA)

CALL HCP IF...

- ◆ New **rash** while on allopurinol
- ◆ Severe **diarrhea** on colchicine
- ◆ Flank pain, blood in urine (kidney stone)
- ◆ **Fever + hot, swollen joint** (septic arthritis)
- ◆ Decreased urine output
- ◆ Tophi that ulcerate or drain
- ◆ Flares lasting > 1 week or recurring monthly
- ◆ Black/tarry stools (NSAID GI bleed)

o8 № Memory Boosters

"G-O-U-T"

- G** **Great toe** (podagra — classic site)
- O** **Overproduction** or underexcretion of uric acid
- U** **Urate crystals** deposit in joints
- T** **Tophi & Triggers** (alcohol, purines, diuretics)

"PURINE" — foods to AVOID

- P** **Pork** & red meat
- U** **Unfortunate** seafood (anchovies, sardines, shellfish)
- R** **Refined** sugars / fructose
- I** **Internal** organs (liver, kidney)
- N** **Nasty** beer & alcohol
- E** **Ethanol** in general

"CHEERS" (treatment)

- C** **Colchicine** within 24 hrs of flare
- H** **Hydration** 2–3 L/day
- E** **Elevate** the affected joint
- E** **End** high-purine foods
- R** **Reduce** weight gradually
- S** **Stop** aspirin & alcohol

Quick Drug Hooks

ALLO-PUR-inol = *ALLOWS LESS PURine* (↓ production)

PROBENE-cid = *PROBES out aCID* (↑ excretion)

Colchicine = "*Colchi-CLEAN*" the inflammation (acute)

⚡ "*Hot joint + great toe + middle-aged man + steak & beer last night*" = **GOUT**

🔑 Pattern Recognition

Gout

Sudden onset • Asymmetric •
Hot/red/swollen • ↑ uric acid • MSU
crystals

Osteoarthritis

Gradual • Weight-bearing joints •
Stiffness after rest • No systemic signs

Rheumatoid

Symmetric • Small joints • Morning
stiffness > 1 hr • + RF / anti-CCP

09

Nº NCJMM — Clinical Judgment Case

SCENARIO: A 58-year-old male, BMI 32, with a history of hypertension treated with hydrochlorothiazide, presents to the ED at 2 AM with severe pain in the right great toe that woke him from sleep. The toe is red, hot, swollen, and exquisitely tender — he winces when the sheet touches it. He recalls a celebratory steakhouse dinner with three beers the previous night. He reports a similar but milder episode six months ago. Vital signs: T 99.2°F, BP 148/86, HR 96, RR 18, SpO₂ 98%.

STEP 1

Recognize Cues

- ◆ **Acute, nocturnal onset** of monoarticular pain
- ◆ **Podagra** — 1st MTP joint inflamed, red, hot, swollen, exquisitely tender
- ◆ Risk factors: **obesity (BMI 32), thiazide diuretic, purine-rich meal + alcohol** last night
- ◆ Prior similar episode 6 months ago (recurrent pattern)
- ◆ Low-grade fever (99.2°F) — borderline; consider differential

STEP 2

Analyze Cues

- ◆ Pattern is highly suggestive of an **acute gout flare**
- ◆ **HCTZ** contributes to hyperuricemia by ↓ urate excretion
- ◆ Alcohol (esp. beer) + purine load = classic precipitant
- ◆ Must rule out **septic arthritis** — fever + hot joint mandates joint aspiration
- ◆ Recurrence suggests chronic underexcretion phenotype

STEP 3

Prioritize Hypotheses

- ◆ ① **Acute gout flare** — highest probability (history, risk factors, presentation)
- ◆ ② **Septic arthritis** — must exclude due to fever; emergent
- ◆ ③ **Pseudogout** (calcium pyrophosphate) — less likely at this site

- ◆ ④ Cellulitis — possible but less monoarticular

STEP 4

Generate Solutions

- ◆ **Arthrocentesis** to confirm MSU crystals & rule out septic arthritis
- ◆ Acute pain: NSAID (e.g., indomethacin) *or* colchicine *or* oral steroid
- ◆ Non-pharm: ice, elevation, **bed cradle**, rest
- ◆ IV fluids → push to 2–3 L/day
- ◆ Hold HCTZ and discuss alternative antihypertensive with HCP
- ◆ Plan to initiate **allopurinol 2–4 weeks AFTER** flare resolves (not now)
- ◆ Nutrition referral; patient teaching on diet, alcohol, weight loss

STEP 5

Take Action

- ◆ Administer **indomethacin 50 mg PO TID with food** as ordered
- ◆ Apply ice pack to right great toe 20 min q2h
- ◆ Elevate right foot on 2 pillows; place **bed cradle** over feet
- ◆ Initiate IV NS at 125 mL/hr; encourage PO fluids
- ◆ Notify HCP of HCTZ contribution; clarify whether to hold/replace
- ◆ Educate on avoidance of beer, organ meats, shellfish; teach signs of NSAID GI bleed
- ◆ Reassess pain & joint q1h × 4, then q4h

STEP 6

Evaluate Outcomes

✓ Effective

- ◆ Pain ↓ from 10/10 to ≤ 3/10 within 24 hrs
- ◆ Swelling/erythema decreasing; ROM improving
- ◆ Urine output > 0.5 mL/kg/hr; clear urine

✗ Ineffective / Escalate

- ◆ Pain persists or worsens after 48 hrs of therapy
- ◆ Temperature climbs > 101°F → re-evaluate for sepsis
- ◆ Melena / coffee-ground emesis → stop

- ◆ No GI bleeding signs; patient verbalizes diet plan
- ◆ Joint aspirate: MSU crystals +, gram stain & culture negative

NSAID

- ◆ Severe diarrhea on colchicine → stop drug
- ◆ Oliguria, rising creatinine → urate nephropathy concern

NGN NCLEX 2026 Visual Study Library — Gout (Musculoskeletal / Metabolic)

ALIGNED TO NCJMM • DIANE'S HIGH-YIELD SERIES • REFERENCE: SAUNDERS • ATI • LIPPINCOTT