MUSCULOSKELETAL · PERI-OPERATIVE · NGN NCLEX 2026

Joint Replacement
Hip & Knee Arthroplasty

Total Hip (THA) & Total Knee Arthroplasty (TKA) — complications, priority care, patient teaching, and clinical judgment for the NGN exam.

PRIORITY DVT / PE PREVENTION

RED FLAG HIP DISLOCATION

TEACH HIP PRECAUTIONS × 6–12 WKS

AVOID PILLOW UNDER KNEE

1 DEFINITION & OVERVIEW

Replacing a damaged joint with a *prosthesis*

ARTHROPLASTY

Surgical replacement of a diseased joint with a metal/polyethylene/ceramic prosthesis to restore function & relieve pain.

Most often performed for **osteoarthritis**, rheumatoid arthritis, avascular necrosis, or fracture. The goal is pain relief, improved mobility, and return to ADLs — with the critical nursing focus on **preventing complications** (clot, infection, dislocation) and **optimizing early mobility**.

6–12

Weeks of hip precautions (posterior approach)

#1

Complication: DVT / PE

<90°

Max hip flexion (posterior THA)

POD 1

Early ambulation goal

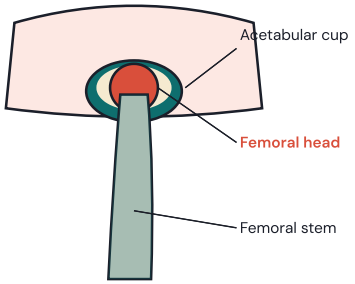
Anatomy at a Glance

The Prosthetic Joint

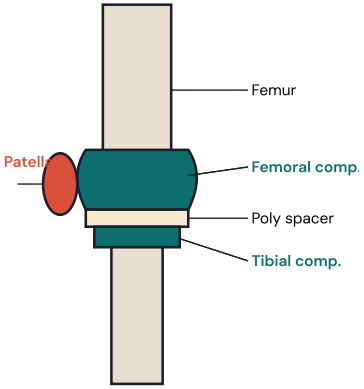
In **THA**, the femoral head is replaced with a metal ball that articulates in a polyethylene-lined cup seated in the acetabulum. In **TKA**, the distal femur, proximal tibia, and often the patella are resurfaced with metal and polyethylene components.

- Cemented vs. uncemented fixation
- Weight-bearing status per surgeon
- Prosthesis lifespan: ~15–20 years

TOTAL HIP (THA)



TOTAL KNEE (TKA)



2 PATHOPHYSIOLOGY

From *joint disease* to surgical replacement

1 — Cartilage Wear
OA, RA, trauma, or AVN destroys articular cartilage & subchondral bone.

→

2 — Bone-on-Bone
Loss of cushion → pain, crepitus, stiffness, decreased ROM.

→

3 — Failed Conservative Rx
NSAIDs, PT, steroid injections no longer relieve pain/disability.

→

4 — Surgical Resection
Diseased bone/cartilage removed; prosthesis implanted (cemented or press-fit).

→

5 — Recovery & Risks
Healing + rehab; watch for **clot, infection, dislocation**.

3 THA VS. TKA

Compare the *two most tested* replacements

Total Hip (THA)

TOTAL HIP ARTHROPLASTY

Ball-and-socket joint replaced. **Surgical approach dictates precautions** — posterior is most common but carries the highest dislocation risk.

Surgical Approaches

POSTERIOR	Most common · **HIGHEST dislocation risk** · strict hip precautions
ANTERIOR	Fewer precautions · faster recovery · avoid hyperextension
LATERAL	Avoid adduction & active abduction during healing

Positioning (Posterior THA)

- **Abduction pillow** between legs while in bed
- **No hip flexion > 90°** (no low chairs, no bending to tie shoes)
- **No internal rotation** (toes straight up / slightly out)
- **No adduction** past midline (no crossing legs / ankles)
- Head of bed raised **no more than 60°**

Total Knee (TKA)

TOTAL KNEE ARTHROPLASTY

Hinge joint resurfaced. Priorities are **ROM, extension, and quad strengthening** — contractures are the enemy.

Key Devices & Goals

CPM	Continuous Passive Motion — if ordered, start low & increase ROM
ICE	Reduces swelling & pain → improves ROM
NO PILLOW	**Never** place pillow under the knee — causes flexion contracture

Positioning (TKA)

- Keep leg in **full extension** when at rest
- **No pillow under knee** — place under heel/calf only
- Elevate leg on pillows **straight out** to reduce edema
- Goal: **90° flexion by discharge**; full extension
- Quad sets, heel slides, straight-leg raises

4 SIGNS, SYMPTOMS & COMPLICATIONS

What to *recognize* before it becomes a code

Pre-Op Presentation

Why the patient is here

- **Chronic joint pain** — worse with activity, relieved with rest
- **Stiffness** after inactivity (esp. morning)
- **Decreased ROM** & function (can't climb stairs, put on socks)
- **Crepitus** — grinding/clicking with movement
- **Deformity** — varus ("bow-leg") or valgus ("knock-knee")
- **Visible joint swelling** and warmth (effusion)

Post-Op Red Flags

Recognize these to save a life or a prosthesis

- **Affected leg shorter + internally rotated** → 🚨 DISLOCATION
- **Sudden SOB, chest pain, tachycardia, anxiety** → 🚨 PE
- **Unilateral calf pain, warmth, swelling** → DVT
- **Fever, drainage, increasing pain** at site → infection
- **Numbness, foot drop, pallor, no pedal pulse** → neurovascular compromise
- **Petechiae on chest, confusion, dyspnea** → fat embolism

TOP POST-OP COMPLICATIONS

CRITICAL · #1 RISK

DVT / Pulmonary Embolism

Venous stasis + endothelial injury + hypercoagulability (Virchow's triad). Peak risk 2–5 days post-op.

Cue: unilateral calf pain → sudden SOB

CRITICAL · THA

Hip Dislocation

Prosthetic head pops out of acetabulum — pain, deformity, inability to bear weight.

Cue: leg shortened + internally rotated

HIGH · PROSTHESIS LOSS

Infection

Deep periprosthetic joint infection can require hardware removal. Prophylactic ABX given within 1 hour pre-op.

Cue: fever, drainage, worsening pain

HIGH

Hemorrhage / Anemia

Large wound + highly vascular bone → significant blood loss. Monitor H&H, drain output.

MODERATE · TKA

Peroneal Nerve Injury

Compression against knee → foot drop, numbness between 1st & 2nd toes, decreased dorsiflexion.

MODERATE

Fat Embolism

Long-bone surgery releases marrow fat into circulation (24–72 hr post-op).

Cue: hypotension, tachycardia, pallor

Cue: can't pull toes up, numb top of foot

Cue: petechiae on chest, AMS, hypoxia

🚨 The Hip Dislocation Triad

If you see these three findings together, stop ambulation, keep patient still, notify provider immediately.

Shortened leg

Affected leg visibly shorter than unaffected leg

Internal rotation

Toes point inward / foot rolls inward

Severe pain

Sudden, deep pain + popping sensation

Can't move leg

Inability to bear weight or move joint

5 PRIORITY NURSING INTERVENTIONS

ABCs, safety, and *clot-prevention first*

Immediate Post-Op (0–24 hr)

Airway, bleeding, circulation, positioning

- **A/B** **Assess airway & O_2 sat** q1–2 hr; watch for sedation from opioids & fat embolism (hypoxia, AMS).
- **C** **Vital signs q15 min → q1 hr → q4 hr;** monitor for hemorrhage (↓BP, ↑HR, pale, diaphoretic).
- **CIRC** **Neurovascular checks** q1–2 hr: color, warmth, cap refill, pedal pulses, movement, sensation distal to operative site.
- **POSIT** **THA:** abduction pillow, no flexion >90°, no crossing legs. **TKA:** leg in extension, **NO pillow under knee**.
- **SAFE** **Hemovac / JP drain** — maintain suction, empty & record q shift; report >100 mL/hr or sudden bright red.
- **PAIN** **Multimodal analgesia:** scheduled acetaminophen + NSAID + PRN opioid (PCA common); ice the joint.

Ongoing & Rehab (24 hr – Discharge)

Clot prevention, mobility, teaching

- **DVT** **Prophylactic anticoagulation** (enoxaparin, apixaban, warfarin). **SCDs** when in bed. **Ankle pumps** q hr awake.
- **MOVE** **Early ambulation POD 1** with PT; use walker → progress as tolerated; weight-bearing per surgeon order.
- **ROM** **TKA: CPM** (if ordered), quad sets, heel slides, straight-leg raises. **THA:** isometric glute & quad sets — avoid prohibited motions.
- **FALL** **Fall precautions:** call bell within reach, non-skid socks, clear path, adequate lighting — opioids + new mobility = high fall risk.
- **LABS** **Monitor H&H, coags (INR/aPTT/anti-Xa), WBC, CRP;** check glucose (steroid use) and electrolytes.
- **INF** **Infection prevention:** sterile dressing changes, perioperative ABX within 1 hr pre-incision, inspect incision every shift.
- **BOWEL** **Prevent constipation** (opioids + immobility): stool softener, fluids, fiber, early ambulation.
- **DC** **Discharge planning day 1:** home equipment (raised toilet seat, reacher, walker), PT follow-up, anticoagulation teaching.

6 PHARMACOLOGY

Anticoagulation, analgesia, and *antibiotics*

DRUG · CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Enoxaparin LMW Heparin — SC	Inhibits factor Xa → prevents clot formation.	Bleeding, bruising, thrombocytopenia (HIT), injection-site pain.	Give in abdomen; do NOT aspirate or rub site; no antidote (protamine partial). Monitor H&H, platelets. Hold if active bleed.
Warfarin Vit K antagonist — PO	Inhibits vitamin K–dependent clotting factors (II, VII, IX, X).	Bleeding; narrow therapeutic window.	**Monitor INR** (goal 2–3). Antidote: **Vitamin K**. Consistent dietary vit K intake. Many drug interactions.
Apixaban / Rivaroxaban DOAC — PO	Direct factor Xa inhibitors.	Bleeding (fewer interactions than warfarin).	No routine labs. Antidote: **andexanet alfa**. Rivaroxaban given with food (20 mg). Don't stop abruptly.
Acetaminophen Non-opioid analgesic	Central COX inhibition, raises pain threshold.	Hepatotoxicity with excess dose/ETOH.	Max **4 g/24 hr** (3 g if older/liver dz); scheduled around the clock is multimodal strategy cornerstone.
Ketorolac / Celecoxib NSAIDs	COX inhibition → ↓ prostaglandins, ↓ inflammation & pain.	GI bleed, renal injury, ↑ BP, ↑ bleed risk.	Take with food; **ketorolac IV limited to 5 days**. Hold if renal dysfunction or active bleeding.
Oxycodone / Hydromorphone Opioid agonists	Bind μ-opioid receptors → ↓ pain perception.	Resp depression, sedation, constipation, N/V, urinary retention, itching.	Monitor RR & sedation; pair with stool softener. Antidote: **naloxone**. PCA common; fall precautions.
Cefazolin 1st-gen cephalosporin	Disrupts bacterial cell wall synthesis.	Rash, GI upset, C. diff, cross-sensitivity with PCN.	Give **within 1 hour before incision**; assess PCN allergy. Redose if surgery > 4 hrs or blood loss > 1500 mL.

Docusate / Senna Stool softener / stimulant	Softens stool / stimulates peristalsis.	Cramping, diarrhea.	Start prophylactically with opioid therapy; encourage fluids, fiber, early ambulation.
Tranexamic Acid (TXA) Antifibrinolytic	Blocks plasminogen → stabilizes clot, reduces surgical blood loss.	Thrombosis risk, N/V, hypotension.	Given intra-op or immediately post-op; assess for clotting disorders prior.

7 NCLEX TEST TRAPS

What students *get wrong*

✗ TRAP

Placing a pillow under the knee to "make the patient comfortable" after TKA.

✓ RIGHT

Keep the knee in **full extension**. Pillow goes under the **heel or calf** — never the knee. A pillow under the knee causes a **flexion contracture** that destroys the outcome of the surgery.

✗ TRAP

Helping a post-op THA patient cross their legs to get comfortable, or bend forward to pick something up.

✓ RIGHT

No crossing legs, no bending > 90°, no internal rotation × 6–12 weeks. Use an abduction pillow, reacher, raised toilet seat, and long-handled shoehorn.

✗ TRAP

Massaging the calf of a patient complaining of calf pain to "work it out."

✓ RIGHT

Never massage a suspected DVT. Could dislodge the clot → PE. Assess, notify provider, anticipate Doppler & anticoagulation.

✗ TRAP

Choosing "reposition the patient" first when you see the affected leg shortened and internally rotated after THA.

✓ RIGHT

That's a **dislocation**. Keep the patient still, maintain abduction, notify the surgeon. Do **not** try to reposition the joint yourself.

✗ TRAP

Picking "Take warfarin at bedtime with food" when patient teaches back.

✓ RIGHT

Warfarin timing is fine, but focus on **consistent vitamin K intake** (not avoid green veggies completely), routine INR, bleed precautions, and knowing the antidote is **vitamin K**.

✗ TRAP

Selecting "keep the patient on bed rest for 24 hours post-op" to prevent dislocation.

✓ RIGHT

Early ambulation is the goal — usually POD 1. Bed rest increases DVT, pneumonia, and pressure injury risk. Ambulate with PT & proper precautions.

✗ TRAP

✗ TRAP

Thinking a low-grade fever on POD 1 means infection and pushing for antibiotics.

✓ RIGHT

Low-grade fever in the first 24–48 hr is often **atelectasis** — encourage incentive spirometer, cough & deep breathe, and early ambulation. **Worry about infection after POD 3–5** with increasing fever, drainage, or purulence.

Removing SCDs because the patient says "they're annoying."

✓ RIGHT

SCDs stay on **whenever the patient is in bed or chair**. Educate on purpose, check skin underneath, remove only for ambulation or bathing.

8 NCJMM CLINICAL JUDGMENT SCENARIO

Recognize → Analyze → Prioritize → *Evaluate*

CASE STUDY

*A 68-year-old female is POD 2 after a posterior-approach total hip arthroplasty. On morning rounds, the nurse finds her in bed without her abduction pillow. She reports sudden severe right hip pain after reaching for the call light. On exam: right leg appears **shorter than the left** and the right foot is **rotated inward**. BP 148/92, HR 112, RR 22, Spo_2 96%. She is unable to move the right leg.*

STEP 1 · RECOGNIZE

Recognize Cues

Concerning: shortened + internally rotated leg, sudden severe pain, inability to move, tachycardia, HTN, missing abduction pillow. Classic **hip dislocation** picture.

→

STEP 2 · ANALYZE

Analyze Cues

Posterior approach = **highest dislocation risk**. Abduction pillow removed + reaching (flexion/rotation) = prosthetic head out of socket. Pain and tachycardia are sympathetic response. Not a fracture — position is classic.

→

STEP 3 · PRIORITIZE

Prioritize Actions

1) Keep pt still — do NOT reposition. **2)** Maintain abduction with pillow. **3)** Notify surgeon STAT. **4)** NPO (possible closed reduction/OR). **5)** Pain management & reassurance. **6)** Neurovascular checks.

→

STEP 4 · EVALUATE

Evaluate Outcomes

Expected: leg realigned after reduction, pain controlled, neurovascular intact, abduction brace ordered, pt verbalizes hip precautions, no further dislocation. Reinforce teaching & reassess precautions understanding.

9 PATIENT & FAMILY EDUCATION

Teaching that *protects the prosthesis*

🦴 After Hip Replacement (Posterior)

Precautions typically last **6–12 weeks** (per surgeon).

DO

- ✓ Keep knees **apart** (abduction pillow / wedge)
- ✓ Use a **raised toilet seat**, reacher, long shoehorn, sock aid
- ✓ Sit in **firm, high chairs with arms**
- ✓ Point toes **straight up** or slightly outward
- ✓ Take anticoagulant as prescribed; bleed precautions
- ✓ Report fever, drainage, sudden hip pain, calf pain, or SOB

DON'T

- ✗ **No bending hip > 90°** (no tying shoes, sitting on low couch/toilet)
- ✗ **No crossing legs** at the knees or ankles
- ✗ **No internal rotation** (toes turned inward)
- ✗ Avoid sleeping on the operative side until cleared
- ✗ No driving until cleared (usually 4–6 weeks)
- ✗ No twisting at the hip when turning

🦵 After Knee Replacement

Goal: **full extension + ≥ 90° flexion** by discharge, continuing in PT.

DO

- ✓ Perform **quad sets, heel slides, SLRs** as taught
- ✓ **Ice** 20 min after exercise to reduce swelling
- ✓ Elevate leg **straight out** (pillow under calf/ankle only)
- ✓ Use walker → cane → unassisted per PT
- ✓ Take scheduled acetaminophen/NSAID + PRN opioid before PT
- ✓ Keep incision clean, dry; report drainage, fever, odor

DON'T

- ✗ **No pillow under the knee** — ever
- ✗ Don't skip PT or prescribed exercises
- ✗ Don't kneel until cleared by surgeon
- ✗ Don't ignore numbness, foot drop, or new calf pain
- ✗ Don't let the knee stay bent at rest
- ✗ Don't stop anticoagulant early without provider approval

💊 Lifelong Prosthesis Protection

INFECTION PREVENTION

- Notify ALL providers (including dentist) of joint replacement
- May need **prophylactic antibiotics** before dental work/invasive procedures
- Treat skin infections, UTIs, and dental issues promptly — bacteria can seed the prosthesis

LIFESTYLE & SAFETY

- Low-impact exercise (walking, swim, bike); avoid high-impact (running, jumping)
- Carry an **implant ID card** — metal detectors at airports
- Maintain healthy weight; fall prevention at home (rugs, lighting, grab bars)

10 MEMORY BOOSTERS & MNEMONICS

Fast recall for *exam day*

PROTECT

THA Posterior Precautions

- **P** illow between legs (abduction)
- **R** otation — no internal rotation
- **O** ver 90° of flexion — NO
- **T** oes point up / slightly out
- **E** levated toilet seat + reacher
- **C** ross legs — NEVER
- **T** urn as a unit — no twisting

STRAIGHT

TKA Positioning Rule

- **S** upport heel, NOT the knee
- **T** ry for full extension at rest
- **R** ange of motion — quad sets, heel slides
- **A** mbulate early (POD 1)
- **I** ce after exercise
- **G** oal: 90° flexion by discharge
- **H** old off on pillow under knee
- **T** each CPM & PT compliance

CLOT

Post-Op DVT/PE Prevention

- **C** ompression (SCDs) & early ambulation
- **L** ovenox / DOAC / warfarin as ordered
- **O** bserve for calf pain, SOB, chest pain
- **T** each: NO leg massage, report calf pain

DISLOC

Hip Dislocation Red Flags

- **D** eformity (leg shortened)
- **I** nternal rotation of foot/toes
- **S** udden, severe pain
- **L** oss of movement in leg
- **O** bvious popping sensation
- **C** all surgeon — do not reposition

HIP

Recognize Fat Embolism

- **H** ypoxia / dyspnea (sudden)
- **I** tty-bitty petechiae on chest, axilla, conjunctiva
- **P** sych changes — confusion, AMS (24–72 hr post-op)

6 P's

Neurovascular Compromise Check

- **P** ain (disproportionate)
- **P** allor (pale, cool)
- **P** ulselessness (weak/absent)
- **P** aresthesia (tingling, numbness)
- **P** aralysis (can't move)
- **P** oikilothermia (cold extremity)

— Joint Replacement · NGN NCLEX 2026 Study Guide —

Musculoskeletal Series · Prioritize clot prevention, dislocation red flags, and early mobility