CARDIAC · SURGICAL · NCLEX 2026

CABG *Surgery*

Coronary Artery Bypass Graft — Nursing Care & Patient Teaching

CLINICAL JUDGMENT | PRIORITIZATION | PHARMACOLOGY | PT. EDUCATION

1 Definition & Overview

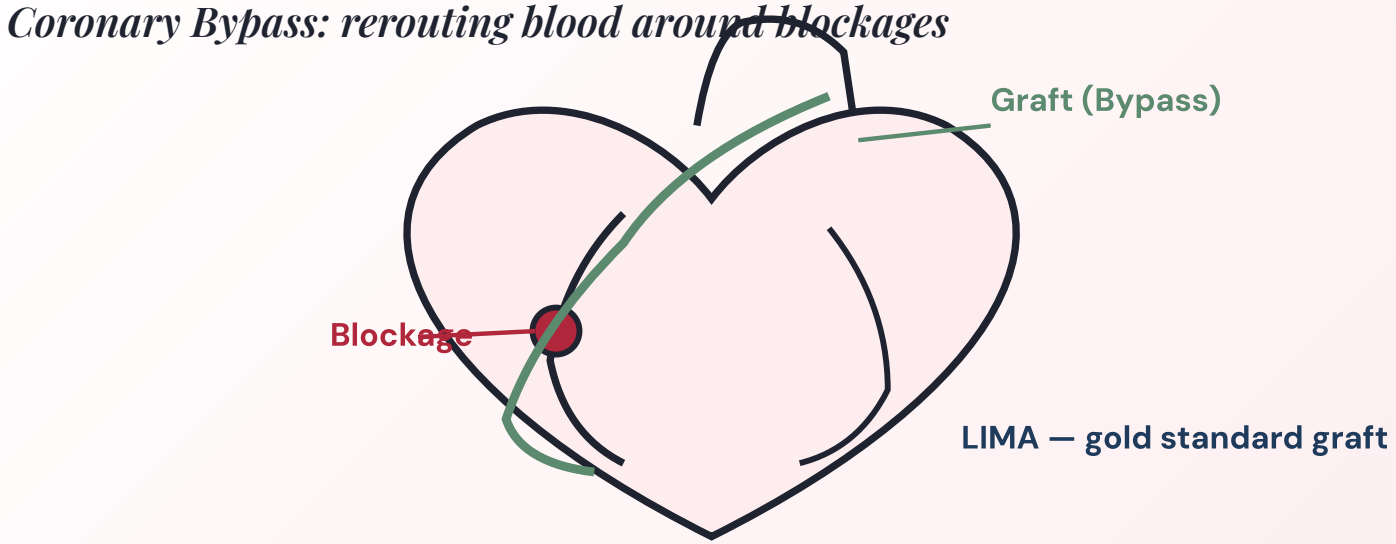
What is CABG and why it matters

The Surgery

- **Open-heart surgery** that creates a new path (graft) *around* blocked coronary arteries to restore myocardial blood flow.
- Performed via **median sternotomy**, usually with cardiopulmonary bypass (heart-lung machine).
- Common grafts: **Internal Mammary Artery (LIMA)** — gold standard, lasts longest; **Saphenous Vein** (leg); **Radial Artery** (arm).

Indications (Why CABG?)

- **Left main** coronary artery disease > 50%
- **Triple-vessel** CAD (esp. with diabetes or low EF)
- Failed or unsuitable for **PCI / stenting**
- Severe angina **refractory** to medical therapy
- Post-MI complications (e.g., papillary muscle rupture)



A graft creates a detour, restoring oxygenated blood to ischemic myocardium.

2 Pathophysiology Flow

CAD → ischemia → CABG → restored perfusion

1. CAD
Atherosclerotic plaque narrows coronary arteries

→

2. Ischemia
↓ O_2 delivery to myocardium → angina, ↓ EF

→

3. Critical Stenosis
Multi-vessel or left main blockage

→

4. CABG
Graft routes blood *around* the blockage

→

5. Reperfusion
Restored myocardial perfusion → ↓ angina, ↑ survival

3 Pre-Op Nursing Care

Prepare the patient — body, labs, mind

Assessment & Labs

- **Baseline VS** + cardiac/respiratory assessment
- Labs: **CBC, BMP, PT/INR/aPTT, T&C** (2+ units PRBCs)
- EKG, CXR, echo, cardiac cath report
- Verify **allergies** (esp. iodine, latex, shellfish)
- Document baseline **peripheral pulses** (graft donor sites)

Medications to HOLD

- **ASA, Plavix (clopidogrel)** — typically held 5–7 days pre-op
- **Warfarin** — held 3–5 days; bridge with heparin if needed
- **Metformin** — held 24–48 hr pre-op (lactic acidosis risk)
- Continue beta-blockers & statins (cardioprotective)

Pre-Op Teaching

- **Incentive spirometer** use — practice now
- **Splint** chest with pillow when coughing
- **Leg exercises** (ankle pumps) to prevent DVT
- Expect: **ETT, chest tubes, Foley, A-line, central line, pacer wires** on waking
- **Smoking cessation** — at least 24 hr (ideally 4–8 wks) before

Skin & NPO Prep

- **NPO after midnight** (or per protocol)
- **Chlorhexidine (CHG) shower** night before & AM of surgery
- Clip — **do NOT shave** — chest, groin, legs, arms
- Verify **informed consent**; remove dentures, jewelry, nail polish

4 Post-Op Priority Nursing Interventions

ABCs first — ICU care, hemodynamic monitoring, complication watch

🅰 Airway / Breathing

- Patient arrives intubated → wean & **extubate within 6–8 hr**
- Monitor **SpO_2, ABGs, breath sounds** q1h
- **Incentive spirometer q1h** while awake; turn-cough-deep-breathe (splint!)
- Early ambulation by POD 1 to ↓ atelectasis & pneumonia

🅱 Circulation / Hemodynamics

- Continuous **EKG, A-line BP, CVP**; PA catheter if unstable
- Goal MAP **70–90 mmHg**; SBP often kept < 140 to protect grafts
- Watch for **A-fib** (most common post-op arrhythmia, peaks POD 2–3)
- Epicardial **pacer wires** — keep handy & insulated
- Assess **peripheral pulses**, cap refill, leg incision

🩸 Chest Tube Management

- Mediastinal drainage usually **< 100 mL/hr** initially
- 🚨 **> 100–150 mL/hr × 2 hr → notify surgeon** (hemorrhage / tamponade risk)
- **DO NOT strip or milk** tubes (current guideline — causes negative pressure injury)
- Watch for **sudden cessation** of drainage = clot / tamponade

💉 Fluid, Electrolytes & Glucose

- Strict **I&O**, daily weights, hourly UOP (goal > 30 mL/hr)
- Replace **K^+ & Mg^{2+}** aggressively (prevent A-fib & arrhythmias)
- Tight **glucose control** (140–180 mg/dL) — even non-diabetics; ↓ infection
- Pain control with IV opioids → transition to PO

🚨 RED FLAGS — Notify Provider Immediately

- **Cardiac Tamponade** — Beck's Triad: muffled heart sounds + JVD + hypotension; sudden ↓ chest tube output, narrowed pulse pressure, pulsus paradoxus
- **Hemorrhage** — chest tube > 100–150 mL/hr × 2 hr, ↓ BP, ↑ HR, ↓ H&H
- **MI / graft occlusion** — new ST changes, chest pain, troponin rise
- **Stroke** — new neuro deficit, facial droop, ↓ LOC
- **Sternal instability** — "clicking" or popping sternum, drainage, fever (mediastinitis)

5 Pharmacology

Lifelong cardioprotection + post-op control

Aspirin (ASA)

ANTIPLATELET

Mech: Inhibits COX-1 → ↓ platelet aggregation; keeps grafts patent.

Dose: 81–325 mg PO daily — **LIFELONG**; resume within 6 hr post-op.

Watch: Bleeding, GI upset, tinnitus.

Metoprolol

BETA-BLOCKER

Mech: ↓ HR & contractility → ↓ O_2 demand; **prevents A-fib**.

Watch: Bradycardia (< 60), hypotension, bronchospasm in COPD/asthma.

Hold & call: if HR < 60 or SBP < 100.

Atorvastatin

STATIN / HMG-COA INHIBITOR

Mech: ↓ LDL → slows atherosclerosis in native & graft vessels.

Watch: Myopathy / rhabdo (muscle pain, ↑ CK), ↑ LFTs.

Teach: Take in evening; avoid grapefruit.

Lisinopril

ACE INHIBITOR

Mech: ↓ afterload, cardiac remodeling; preserves EF.

Watch: Hyperkalemia, dry cough, angioedema, ↓ renal fx.

Amiodarone

CLASS III ANTIARRHYTHMIC

Mech: Converts/prevents post-op **A-fib** (most common post-CABG arrhythmia).

Watch: Pulmonary fibrosis, hepatotoxicity, thyroid dysfunction, blue-grey skin.

Warfarin / Heparin

ANTICOAGULANT

Use: Only if **new A-fib** or mechanical valve replacement.

Watch: Bleeding; monitor **INR (warfarin)** or **aPTT (heparin)**.

Antidote: Vit K (warfarin) / Protamine (heparin).

Dobutamine / Milrinone

INOTROPE (PRN)

Use: Low cardiac output post-op; strengthens contractility.

Watch: Tachycardia, dysrhythmias, ↑ myocardial O_2 demand.

Titrate: to BP & UOP.

Morphine / Fentanyl

OPIOID ANALGESIC

Use: Sternotomy pain. Adequate pain control = better deep breathing.

Watch: Resp depression, hypotension, constipation.

Furosemide

LOOP DIURETIC

Use: Treat fluid overload / pulmonary edema post-bypass.

Watch: Hypokalemia (↑ A-fib risk), ototoxicity, dehydration.

6 NCLEX Test Traps

Common wrong-answer patterns — read these twice

Trap: "Strip the chest tubes for clots"

DO NOT strip / milk. Current evidence: causes excessive negative pressure & tissue damage. Maintain patency by gentle hand-over-hand if ordered, but stripping is OUT.

Trap: "Sudden ↓ chest tube drainage = good"

FALSE. Sudden cessation may signal a **clot / tamponade** — assess for Beck's triad & notify surgeon STAT.

Trap: "Cross legs to elevate after vein graft"

NEVER cross legs. Elevate the donor leg on a pillow. Crossing → DVT, edema, graft compromise.

Trap: "Push up from chair using arms"

Sternal precautions: NO pushing/pulling/lifting > 5–10 lb × 6–8 weeks. Teach **log-roll** out of bed.

Trap: "Resume ASA only if having pain"

ASA is LIFELONG & daily after CABG to maintain graft patency — not PRN.

Trap: "A-fib post-op is expected, just observe"

A-fib is COMMON but NOT benign. Treat with rate control (beta-blocker), rhythm control (amiodarone), and assess stroke/embolic risk.

Trap: "Drink lots of fluid for the kidneys"

Fluid overload = pulmonary edema in the post-bypass heart. Strict I&O; daily weights; report > 2–3 lb/day gain.

Trap: "Hold beta-blocker if HR is 65"

Hold only if HR < 60 or SBP < 100 (or per facility). 65 is acceptable; preventing A-fib matters.

7 NCJMM Clinical Judgment Framework

Six-step model applied to post-CABG patient

STEP 1

Recognize Cues

SBP 88/52, HR 132, JVD, muffled heart sounds, chest tube drainage suddenly stopped, anxious patient.

STEP 2

Analyze Cues

Cluster: hypotension + JVD + muffled tones + ↓ drainage = **Beck's Triad → cardiac tamponade**.

STEP 3

Prioritize Hypothesis

Cardiac tamponade is life-threatening & ranks above A-fib, atelectasis, or pain — treat FIRST.

STEP 4

Generate Solutions

Notify surgeon STAT, prepare for **pericardiocentesis or surgical re-exploration**, IV fluids, type & cross 2 units, O_2.

STEP 5

Take Action

Call surgeon & rapid response, raise HOB, bolus NS per order, set up emergency cart, support family.

STEP 6

Evaluate Outcomes

Reassess BP, HR, heart sounds, chest tube output, JVD; goal SBP > 90, HR < 100, restored drainage.

8 Patient & Family Education

Discharge teaching for sternal precautions, lifestyle, when to call

🦴 Sternal Precautions (6–8 weeks)

- **NO lifting > 5–10 lb** (a gallon of milk = 8 lb)
- **NO pushing or pulling** with arms (incl. opening heavy doors)
- **NO driving** until cleared (~4–6 wks); may ride in back seat
- **Log-roll** out of bed; do not push up with arms
- **Splint chest with pillow** when coughing, sneezing, laughing
- Sleep on back or supported side; avoid stomach sleeping

🍎 Lifestyle & Cardiac Rehab

- **Cardiac rehab** — attend! Improves survival & recovery.
- **Heart-healthy diet:** low sodium (< 2 g/day), low sat. fat, Mediterranean style
- **Smoking cessation** — non-negotiable; nicotine constricts grafts
- **Walk daily**, gradually increase distance; avoid extreme temperatures
- **Sexual activity** usually OK in 4–6 wks, when can climb 2 flights of stairs without symptoms

💊 Medication & Wound Care

- Take **ASA, statin, beta-blocker, ACE-I** exactly as ordered — for life
- Keep incision **clean & dry**; pat dry, no lotions/powders on incision
- Shower OK once cleared; **no tub baths/swimming** until healed
- Elevate **donor leg** when sitting; wear compression stockings as ordered
- Daily weights — same time, same scale, similar clothing

🚨 CALL the Provider If...

- Chest pain or pressure, new SOB, palpitations
- Fever > 100.5 °F, chills, redness/drainage at incision
- **"Clicking" or grinding sternum**
- **Weight gain > 2–3 lb in a day or 5 lb in a week**
- Swelling in legs, calf pain, sudden one-sided weakness or facial droop
- Bleeding/bruising (esp. if on warfarin)

9 Memory Boosters & Mnemonics

Anchor the priorities — recall under pressure

HEART

POST-CABG COMPLICATIONS

- **H** Hemorrhage / Hypotension
- **E** Embolism (DVT/PE/stroke)
- **A** Arrhythmias (esp. A-fib)
- **R** Renal failure / fluid overload
- **T** Tamponade / infection

3 D's

BECK'S TRIAD — TAMPONADE

- **D** Distant (muffled) heart sounds
- **D** Distended neck veins (JVD)
- **D** Decreased BP (hypotension)

\+ *Sudden ↓ chest tube drainage = act NOW.*

LIFT

STERNAL PRECAUTIONS — AVOID

- **L** Lifting > 5–10 lb
- **I** Isolated arm movements (pulling)
- **F** Forcing / Pushing up from chair
- **T** Twisting / reaching overhead

A-B-C

POST-OP PRIORITY SEQUENCE

- **A** Airway — extubate, IS, splint & cough
- **B** Breathing — O_2, ABGs, lung sounds
- **C** Circulation — VS, EKG, chest tube, CO

\+ *Then D — Drugs (ASA, BB, statin), E — Education.*

⚡ Quick Pattern Recognition

- **↓ BP + ↓ drainage + JVD =** Tamponade — STAT.
- **Irregularly irregular rhythm POD 2–3 =** A-fib — give beta-blocker / amiodarone, replace K^+/Mg^{2+}.
- **"Clicking" sternum + fever =** Mediastinitis — culture, IV abx, surgical eval.
- **Cool, pale leg with ↓ pulses =** Vein-graft donor-site compromise → notify.
- **LIMA = "Left Internal Mammary Artery" = best long-term graft** (lasts 15–20+ yr vs. 8–10 yr for vein).