

HEMATOLOGY · EMERGENCY · HEMODYNAMICS

Acute Bleeding & Hemorrhagic Shock

Recognize early. Stop the bleed. Restore the volume. Save the patient.

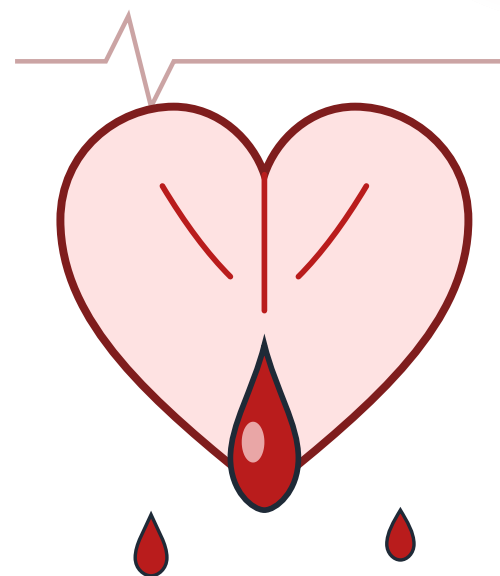
Acute hemorrhage is one of the highest-acuity priority topics on the NGN NCLEX. Mastery requires layered thinking: anatomy of the bleed, recognition of compensated vs. decompensated shock, and exact sequencing of nursing actions *before* hypotension appears.

NGN Clinical Judgment

Priority Setting

ABC Framework

Massive Transfusion



01

FOUNDATION

Definition & Overview

- ▶ **Acute hemorrhage** = sudden, rapid loss of circulating blood volume that exceeds the body's ability to compensate; requires immediate action.
- ▶ **External** bleeding is visible (lacerations, post-op site, GI). **Internal** bleeding is concealed (intra-abdominal, retroperitoneal, intracranial, GI lumen).
- ▶ Untreated acute bleeding progresses through compensated shock → **hemorrhagic (hypovolemic) shock** → multi-organ failure → death. Time matters; the lethal triad of *hypothermia, acidosis, and coagulopathy* develops quickly.

5 L

AVG ADULT TOTAL BLOOD VOLUME

15%

LOSS BEFORE VS CHANGE (CLASS I)

<30 mL/hr

URINE OUTPUT = POOR PERFUSION

02 Pathophysiology

MECHANISM

🔴 The Cascade of Hemorrhagic Shock

- 1 **Blood loss** → ↓ circulating volume → ↓ venous return to the right heart
- 2 **Decreased preload** → ↓ stroke volume → ↓ cardiac output → ↓ tissue perfusion
- 3 **Compensation:** SNS activation → ↑ HR, ↑ RR, peripheral vasoconstriction (cool/pale skin), RAAS & ADH retain Na⁺ + H₂O. *BP may still be normal here.*
- 4 **Decompensation:** compensation fails → hypotension, anaerobic metabolism, lactic acidosis, ↓ LOC, oliguria
- 5 **Irreversible shock:** cellular death, multi-organ failure → death

🇮🇹 ATLS Hemorrhage Classes (memorize these!)

CLASS	BLOOD LOSS	HR	BP	MENTAL STATUS	URINE OUTPUT
Class I	<15% (<750 mL)	Normal	Normal	Slightly anxious	>30 mL/hr

CLASS	BLOOD LOSS	HR	BP	MENTAL STATUS	URINE OUTPUT
Class II	15–30% (750–1500 mL)	↑ >100	Normal (narrow PP)	Anxious / restless	20–30 mL/hr
Class III	30–40% (1500–2000 mL)	↑↑ >120	↓ Hypotensive	Confused	5–15 mL/hr
Class IV 	>40% (>2000 mL)	↑↑↑ >140 / weak	↓↓ Severe / unobtainable	Lethargic / unresponsive	Negligible / anuric

Key insight: A narrowing pulse pressure (systolic – diastolic) appears in Class II before the systolic BP drops. Watch this trend.

03

RECOGNITION

Signs & Symptoms

EARLY (Compensated)

- **Restlessness, anxiety** — the #1 earliest cue
- Tachycardia (HR > 100)
- Tachypnea
- Narrowing pulse pressure
- Cool, pale, clammy skin
- Capillary refill > 3 sec
- Thirst
- Mild orthostatic changes
- Urine output borderline (20–30 mL/hr)

LATE (Decompensated)

- **Hypotension** (a LATE sign!)
- Weak, thready, or absent peripheral pulse
- Decreased LOC → confusion → coma
- Oliguria < 20 mL/hr → anuria
- Mottled, cyanotic, cold extremities
- Severe metabolic acidosis (↑ lactate)
- Bradycardia (pre-arrest)
- Cardiovascular collapse

RED-FLAG FINDINGS — ACT IMMEDIATELY

- Restlessness in any post-op or trauma patient = bleeding until proven otherwise
- Widening abdominal girth + rigid abdomen = intra-abdominal hemorrhage
- Cullen's sign (peri-umbilical bruising) or Grey-Turner sign (flank bruising) = retroperitoneal bleed
- Hematemesis (bright red vomit) or coffee-ground emesis = upper GI bleed
- Melena (black, tarry, foul stool) = upper GI bleed; Hematochezia (bright red) = lower GI bleed
- Frank red blood through chest tube > 100 mL/hr = surgical re-exploration
- Sudden, sharp drop in H&H, ↑ lactate, base deficit > 6

Bleeding by Color & Source



Bright red: arterial / active bleeding



Dark red: venous bleeding



Coffee-grounds: old upper GI blood



Melena (black, tarry): upper GI bleed



Hematochezia: lower GI bleed



Hematuria: renal/bladder bleed



Pink, frothy sputum: pulmonary edema



Hemoptysis: bright red blood from lungs

ACTION

04 Priority Nursing Interventions

A B C Frame Every Action Through ABC

A

AIRWAY

Patent? Suction emesis/blood. Prepare for intubation if LOC ↓.

B

BREATHING

Apply O₂ via non-rebreather at 100%. Monitor SpO₂, RR, lung sounds.

C

CIRCULATION

STOP THE BLEED. 2 large-bore IVs (16–18 g).
Warm isotonic fluids → blood.

⚡ Step-by-Step Priority Sequence

- 1 **Apply direct pressure** to any visible bleed using sterile gauze (do this *before* taking VS if bleed is uncontrolled).
- 2 **Call for help** / activate rapid response or trauma team.
- 3 **Position** patient supine; passive leg raise is acceptable for transient SBP support. *Avoid full Trendelenburg* — it impairs ventilation and is no longer recommended.
- 4 **Apply high-flow O₂** via non-rebreather mask.
- 5 **Establish 2 large-bore IVs** (16–18 gauge) in upper extremities. Begin warmed **0.9% NS or LR**; bolus per protocol.
- 6 **Draw labs**: type & crossmatch, CBC, PT/PTT/INR, fibrinogen, lactate, ABG, BMP.

7

Transfuse blood products per Massive Transfusion Protocol (1:1:1 ratio); use a blood warmer.

8

Monitor continuously: VS q5–15 min, cardiac rhythm, SpO₂, mental status, capillary refill.

9

Insert indwelling Foley to monitor urine output (goal: > 30 mL/hr or 0.5 mL/kg/hr in adults).

10

Keep patient warm — warmed IV fluids, warming blankets, ambient temp ↑. Hypothermia < 35°C worsens coagulopathy.

11

NPO in case of emergent surgery; insert NG tube for upper GI bleed if ordered.

12

Prepare for definitive treatment: surgery, endoscopy, IR embolization, or balloon tamponade depending on source.

13

Document & reassess after every intervention; trend the data — small changes matter.



Source-Specific Interventions

- ▶ **Post-op surgical bleed:** reinforce dressing (do not remove the first layer); mark drainage; notify surgeon if exceeds expected volume.
- ▶ **GI bleed:** NPO, insert NG to large-bore suction (room-temp lavage if ordered — iced lavage is outdated and not evidence-based), prepare for endoscopy/EGD.
- ▶ **Esophageal varices:** octreotide drip, vasopressin, balloon tamponade (Sengstaken-Blakemore) as a bridge to band ligation.
- ▶ **Trauma extremity bleed:** direct pressure → pressure dressing → tourniquet only if life-threatening and uncontrolled.
- ▶ **Postpartum hemorrhage:** fundal massage first, then oxytocin/methergine/hemabate per protocol.
- ▶ **Anticoagulant-related bleed:** hold the anticoagulant; administer reversal agent (see Pharm).

PHARMACOLOGY

05

Resuscitation & Reversal Agents

CRYSTALLOID

0.9% Normal Saline / Lactated Ringer's

Use: initial volume resuscitation; warm before infusing.

Watch: fluid overload (crackles, JVD), dilutional coagulopathy if > 1.5 L without blood.

⚠️ **NEVER** use D5W for hemorrhage — it causes RBC lysis and shifts to intracellular space.

BLOOD PRODUCT

Packed RBCs (PRBCs)

Use: restore oxygen-carrying capacity; goal Hgb > 7 g/dL (or > 8 in cardiac).

Compat: only with 0.9% NS, NEVER LR (calcium causes clotting) or D5W.

Watch: reactions in first 15 min; transfuse within 4 hours.

BLOOD PRODUCT

Fresh Frozen Plasma (FFP)

Use: replaces clotting factors; reverses warfarin in active bleed.

Watch: volume overload, allergic/febrile reaction.

BLOOD PRODUCT

Platelets / Cryoprecipitate

Platelets: used when count < 50K with active bleeding.

Cryo: rich in fibrinogen & Factor VIII; given when fibrinogen < 150–200 mg/dL.

ANTIFIBRINOLYTIC

Tranexamic Acid (TXA)

Use: trauma, postpartum hemorrhage, surgical bleed; **most effective if given within 3 hours.**

MOA: blocks plasminogen → stabilizes clots.

Watch: seizures, thromboembolism risk.

REVERSAL — WARFARIN

Vitamin K (Phytonadione) / 4-Factor PCC

Use: reverse warfarin; PCC works in minutes, vitamin K in hours.

Lab: trend the INR.

REVERSAL — HEPARIN

Protamine Sulfate

Use: reverses unfractionated heparin (partial reversal of LMWH).

REVERSAL — DOACS

Idarucizumab (Praxbind) & Andexanet Alfa

Praxbind: reverses dabigatran (direct thrombin inhibitor).

Andexanet: reverses Factor Xa inhibitors (rivaroxaban, apixaban).

Watch: hypotension, allergic reaction (esp. fish/shellfish, prior NPH insulin exposure).

VASOPRESSOR

Norepinephrine (Levophed)

Use: only AFTER adequate volume resuscitation if BP remains low.

⚠ Vasopressors do NOT replace lost volume — fix the tank first.

GI BLEED

Octreotide / Vasopressin / PPIs

Octreotide: ↓ portal pressure in variceal bleeds.

Pantoprazole IV: bolus + drip for upper GI bleed (suppresses acid, protects clot).

🔪 Massive Transfusion Protocol (MTP)

For hemorrhage requiring > 10 units PRBCs in 24 hr OR > 4 units in 1 hour:

1 : 1 : 1

PRBCs : FFP : Platelets

Add cryoprecipitate, calcium (citrate in stored blood chelates Ca^{++}), and TXA. Use a blood warmer. Monitor for hyperkalemia and metabolic alkalosis.

06

TEST WISDOM

NCLEX Test Traps



Trap: "First action for an actively bleeding patient?"

~~Take vital signs~~ · **Apply direct pressure / stop the bleed first.** Then assess.



Trap: Waiting for hypotension to act.

~~"BP is still 118/72, patient is fine"~~ · **Restlessness + tachycardia + narrow pulse pressure = compensated shock.** Hypotension is LATE.



Trap: Wrong fluid choice for resuscitation.

~~D5W or 1/2 NS~~ · **Use isotonic 0.9% NS or LR.** D5W lyses RBCs and is hypotonic after dextrose is metabolized.



Trap: Hanging blood with the wrong solution.

~~LR or D5W with PRBCs~~ · **ONLY 0.9% NS is compatible with blood.** Calcium in LR causes clotting; dextrose causes hemolysis.



Trap: Saturated post-op dressing.

~~Remove the dressing to inspect~~ · **Reinforce the dressing,** mark/circle drainage, time it, and notify the surgeon. Removing it can dislodge a forming clot.



Trap: Trendelenburg for shock.

~~Full Trendelenburg~~ · **Supine with passive leg raise** if needed. Trendelenburg compresses the diaphragm and is no longer evidence-based.



Trap: Giving vasopressors before fluids.

~~Start norepinephrine drip first~~ · **Restore volume first;** vasopressors don't replace blood. They just constrict an empty tank.



Trap: Confusing GI bleed sources.

~~Black tarry stool = lower GI bleed~~ · Melena (black, tarry) = UPPER GI bleed; hematochezia (bright red) = LOWER GI bleed.



Trap: Iced saline for gastric lavage.

~~Iced saline lavage~~ · Current evidence does NOT support iced lavage (causes hypothermia, vasoconstriction without proven benefit). Use room-temp saline if lavage is performed at all.



Trap: Massive transfusion ratios.

~~Just give PRBCs~~ · 1:1:1 (PRBCs : FFP : Platelets) prevents dilutional coagulopathy.



Trap: Tourniquet use.

~~Tourniquet first for any bleed~~ · Direct pressure → pressure dressing → tourniquet only if life-threatening, uncontrolled extremity bleed (apply 2–3 inches above wound, note time).

07

CLINICAL JUDGMENT

NCJMM 6-Step Framework

The Next-Gen NCLEX evaluates how you *think*, not just what you know. Walk acute bleeding through the NCSBN Clinical Judgment Measurement Model:

1

RECOGNIZE CUES

Restlessness, ↑ HR, ↑ RR, narrow pulse pressure, cool/pale skin, ↓ Hgb/Hct, ↑ lactate, visible/concealed blood loss.

2

ANALYZE CUES

Pattern fits compensated vs. decompensated shock? Identify the source (surgical, GI, trauma, OB). Assess for coagulopathy or anticoagulant use.

3

PRIORITIZE HYPOTHESES

Hemorrhagic shock is the highest-priority diagnosis — life-threatening, time-sensitive, ABC issue. Rule above pain, anxiety, electrolyte issues.

4

GENERATE SOLUTIONS

Stop the bleed → restore volume (crystalloid → blood) → optimize O₂ delivery → correct coagulopathy → definitive source control (OR, IR, endoscopy).

5

TAKE ACTION

Direct pressure, 2 large-bore IVs, O₂, fluids/blood per MTP, Foley, labs, warm patient, prepare for definitive procedure.

6

EVALUATE OUTCOMES

Improving: HR ↓, BP ↑, MAP ≥ 65, mental status clearing, UOP > 30 mL/hr, lactate trending down, skin warming. Worsening = escalate immediately.

08

TEACHING

Patient & Family Education



Bleeding Precautions

- ✓ Use a soft toothbrush; floss gently
- ✓ Switch to an electric razor (no straight razors)
- ✓ Avoid blowing the nose forcefully
- ✓ Wear shoes/slippers to prevent foot injury
- ✓ Avoid contact sports & high-fall-risk activities
- ✓ Use stool softeners to prevent straining
- ✓ Inform every provider (dentist, surgeon) about anticoagulants
- ✓ Wear a medical alert bracelet



What to Watch For at Home

- ✓ Easy bruising, petechiae, prolonged bleeding from cuts
- ✓ Bleeding gums, frequent nosebleeds
- ✓ Black, tarry, or bloody stools
- ✓ Pink, red, or dark (cola-colored) urine
- ✓ Coughing up blood; hematemesis
- ✓ Heavy or unexpected menstrual bleeding
- ✓ Headache, weakness, blurred vision (possible internal bleed)
- ✓ Dizziness, fainting when standing



Medication Safety

- ✓ Take anticoagulants exactly as prescribed — same time daily
- ✓ Avoid NSAIDs, aspirin, ginkgo, garlic, ginger supplements unless ordered
- ✓ If on warfarin: keep vitamin K intake (leafy greens) **consistent**, not eliminated
- ✓ Get scheduled INR/PT labs without missing
- ✓ Don't double a missed dose; call provider
- ✓ Carry a list of all medications



Managing a Minor Bleed at Home

- ✓ Apply firm, direct pressure for 5–10 minutes (longer if on anticoagulants)
- ✓ Elevate the limb above heart level if possible
- ✓ Apply ice pack over a cloth for nosebleeds; lean forward, not back
- ✓ Do NOT peek under pressure — keep continuous pressure
- ✓ Seek care if bleeding doesn't stop in 10–15 minutes



CALL 911 / GO TO ER IMMEDIATELY IF...

- 🚫 Bleeding cannot be controlled with 10–15 min of direct pressure
- 🚫 Vomiting blood or coffee-ground material
- 🚫 Black, tarry stools or large amounts of bright red rectal blood
- 🚫 Severe abdominal, back, or chest pain
- 🚫 Sudden severe headache, confusion, weakness, slurred speech, or vision loss

- 🔄 Dizziness, fainting, rapid heart rate, or pale/cold/clammy skin
- 🔄 Any head injury while on anticoagulants

09

RECALL

Memory Boosters & Mnemonics

🔴 "TIRED CAT" — SIGNS OF SHOCK

T Tachycardia
(early)

I Increased
RR

R Restlessness
/ anxiety

E Extremities
cold & pale

D Decreased
urine output

C Capillary
refill > 3 sec

A Altered
mental status

T Thready
pulse

⚡ "STOP" — FIRST ACTIONS FOR ACUTE BLEED

S Squeeze
— apply direct pressure

T Two
large-bore IVs

O Oxygen
via non-rebreather

P Position
+ Push fluids/blood

💀 THE "LETHAL TRIAD" OF TRAUMA

A self-amplifying spiral that kills bleeding patients. Prevent & reverse all three.

❄️ **Hypothermia**
— warm fluids, blankets

🧪 **Acidosis**
— restore perfusion, correct lactate

🔴 **Coagulopathy**
— give FFP/platelets/cryo

🍷 "BRIGHT VS. DARK" — READING THE BLOOD

- 🍷 **Bright red, frothy from mouth** = lung (hemoptysis)
- 🍷 **Bright red vomit** = active upper GI bleed (hematemesis)
- ☕ **Coffee-ground emesis** = old upper GI blood (acid-degraded)
- ⬛ **Melena (black, tarry)** = upper GI bleed, digested
- 🍷 **Hematochezia (bright red rectum)** = lower GI bleed

-  **Cola/tea-colored urine** = renal bleed or hemolysis



KEY NUMBERS TO MEMORIZE

- **5 L** = average adult total blood volume
- **15%** blood loss = onset of clinical signs (Class II)
- **30 mL/hr** = minimum acceptable urine output
- **16–18 g** = IV gauge for resuscitation/blood
- **2 mL/min** = max rate for first 15 min of transfusion
- **4 hr** = max time a unit of blood can hang
- **3 hr** = window for TXA effectiveness
- **1:1:1** = MTP ratio (PRBCs : FFP : platelets)
- **MAP $\geq$ 65 mmHg** = perfusion goal

Acute Bleeding & Hemorrhagic Shock · NGN NCLEX 2026 Study Library

Stop the bleed. Restore the volume. Trend the trends. Save the patient.