

NGN NCLEX 2026 · DIANE'S STUDY SERIES

△ HEMATOLOGY · TRANSFUSION SAFETY

Transfusion *Reactions*

Acute Hemolytic · Febrile Nonhemolytic · Anaphylactic — clinical recognition, emergency management, and patient teaching for the NGN NCLEX 2026 Test Plan.

🔴 Hematology

⚗️ Pharmacology

🚑 High-Acuity

🧠 Clinical Judgment

🛡️ Patient Safety

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Definition & Overview

WHAT IT IS — WHY IT MATTERS

A **transfusion reaction** is any adverse response to administration of blood or blood components. Reactions range from mild allergic flushing to life-threatening hemolytic shock or anaphylaxis. **Most life-threatening reactions occur within the first 15 minutes / first 50 mL of infusion** — which is why the nurse must remain at the bedside during this critical window.

MOST DEADLY

Acute Hemolytic

ABO incompatibility → recipient antibodies destroy donor RBCs. **Onset within minutes of starting** the unit. Renal failure, DIC, shock can follow. Hallmark: **low back pain** + flank pain.

MOST COMMON

Febrile Nonhemolytic

Recipient antibodies react with donor **WBCs / cytokines**. Onset 30 min–2 hr into transfusion (or up to 6 hr post). Hallmark: **temperature rise $\geq 1^{\circ}\text{C}$ (1.8°F)** with chills — but no hemolysis.

RAPID & SEVERE

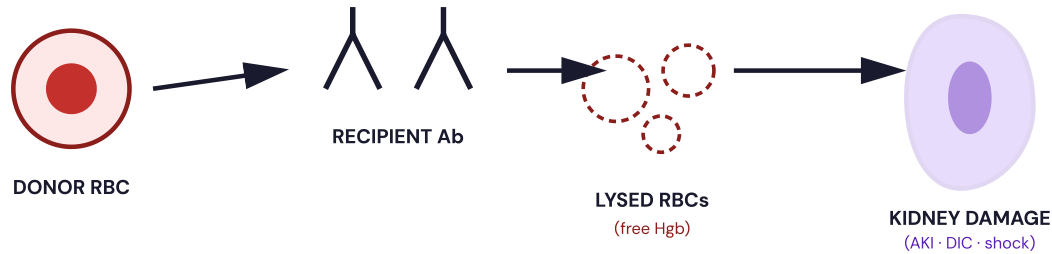
Anaphylactic

IgE-mediated reaction to donor plasma proteins (often **IgA-deficient recipient**). Onset **seconds to minutes**, even after just a few mL. Hallmark: **airway compromise + hypotension**.

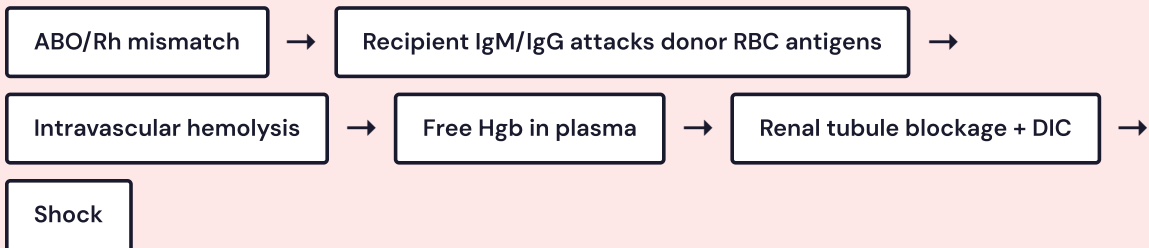
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Pathophysiology

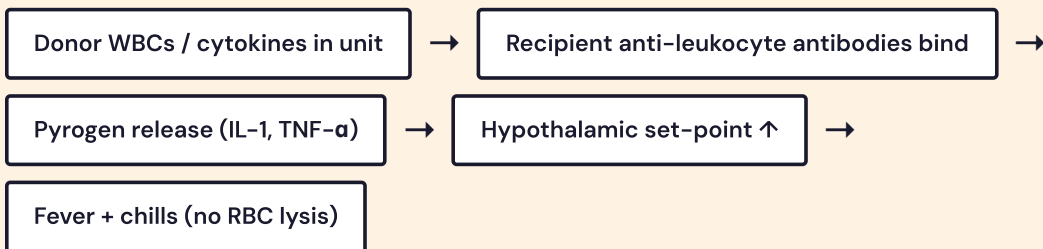
STEP-BY-STEP MECHANISM



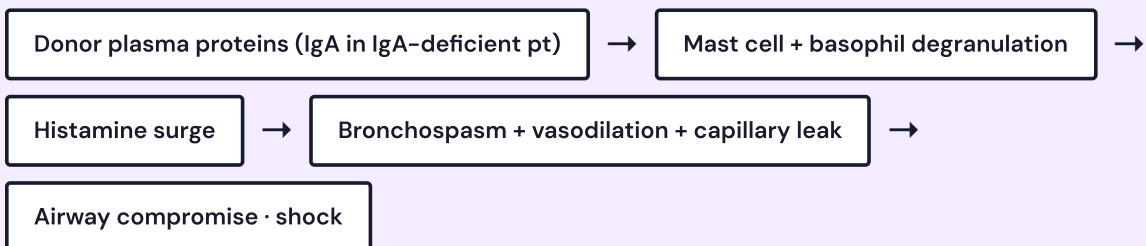
H Acute Hemolytic Reaction



F Febrile Nonhemolytic Reaction



A Anaphylactic Reaction



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Signs & Symptoms — Side-by-Side

RECOGNIZE THE PATTERN · 🚩 = RED FLAG

Feature	ACUTE HEMOLYTIC	FEBRILE NONHEMOLYTIC	ANAPHYLACTIC
ONSET	Within minutes of start (often first 50 mL)	30 min – 2 hr (up to 6 hr post)	Seconds to minutes — even with a few mL
HALLMARK SIGN 🚩	Low back / flank pain	Temp ↑ ≥1°C with chills	Airway swelling + wheezing + hypotension
VITALS	Fever, ↓BP, tachycardia, tachypnea	Fever, mild tachycardia, BP usually stable	↓↓BP, tachycardia, ↓SpO ₂ , weak/thready pulse
SKIN	Flushing, then pallor	Flushing, sometimes mild urticaria	Urticaria (hives), angioedema, lip/tongue swelling
RESPIRATORY	Dyspnea, tachypnea	Usually clear	Wheezing, stridor, bronchospasm
GI / OTHER	Nausea, anxiety, "feeling of doom," chest tightness	Headache, malaise, anxiety	Cramping, nausea, vomiting, diarrhea
URINE 🚩	Red/dark — hemoglobinuria · oliguria	Normal	Normal early (may be ↓ if shock)
LATE RISK	AKI · DIC · death	Self-limiting; rarely progresses	Cardiovascular collapse · death

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The Universal First 5 Steps Same sequence for ANY suspected reaction · ABC + Safety

1
STOP

2
SALINE

Stop the transfusion **immediately**. Clamp the blood line.
This is always first.

Maintain IV with **0.9% NS via NEW tubing** at the hub —
keep vein open.

3 ASSESS

Vital signs, ABCs, breath sounds, skin. **Stay with patient.**

4 NOTIFY

Notify **HCP and blood bank** immediately. Get help to
bedside.

5 SEND

Return blood bag + tubing to lab. Send **blood + urine**
samples per protocol.

📌 **NCLEX TIP:** When the question asks "what does the nurse do **FIRST?**" — the answer is almost always **STOP THE TRANSFUSION**. Saline, vital signs, calling the provider all come *after*.

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Reaction-Specific Management

TAILORED INTERVENTIONS, NURSING CARE & TEACHING

Acute Hemolytic Transfusion Reaction

ABO INCOMPATIBILITY · LIFE-THREATENING

★★★ EMERGENCY



MANAGEMENT

- ▶ **Stop transfusion** + saline via new tubing
- ▶ Maintain IV access — anticipate **large fluid resuscitation** (NS bolus to support BP and renal perfusion)
- ▶ Anticipate orders: **diuretics** (mannitol or furosemide) to flush kidneys
- ▶ **Vasopressors** for refractory hypotension
- ▶ Treat **DIC** with FFP, platelets, cryoprecipitate as ordered
- ▶ Monitor for **AKI**: urine output, BUN/creatinine
- ▶ Send blood + urine samples to lab; double-check unit ID



NURSING CARE

- ▶ Verify identity at bedside **before** hanging unit — most reactions = clerical error
- ▶ Stay with patient first 15 min, infuse **≤2 mL/min** initially
- ▶ VS q15 min initially, then per protocol
- ▶ Strict **I&O** — goal urine output ≥30 mL/hr
- ▶ Monitor labs: H&H, BUN/Cr, LDH, bilirubin, haptoglobin (↓), Coombs
- ▶ Watch for bleeding from gums/IV sites (DIC)
- ▶ Document onset, symptoms, interventions, response



PATIENT & FAMILY TEACHING

- ▶ Explain **any** new symptom during transfusion (back pain, chills, anxiety, "doesn't feel right") must be reported **immediately**
- ▶ Reactions can occur within minutes — never silence the call light during a transfusion
- ▶ After event: future transfusions may require **type-specific, crossmatched** blood with extended testing; pre-medication may be ordered
- ▶ Wear medical alert ID stating prior hemolytic reaction

Febrile Nonhemolytic Transfusion Reaction

ANTI-WBC ANTIBODIES · MOST COMMON

★ MILD

MANAGEMENT

- ▶ **Stop transfusion** until reaction confirmed (rule out hemolytic — they look alike at first!)
- ▶ Maintain saline; notify HCP
- ▶ Administer **antipyretics** as ordered — typically **acetaminophen** (avoid aspirin in thrombocytopenic patients)
- ▶ If chills are severe: anticipate **meperidine (Demerol)** per HCP for rigors
- ▶ Once hemolytic ruled out, transfusion **may resume** per HCP — or unit discontinued
- ▶ Future units: order **leukocyte-reduced** blood

NURSING CARE

- ▶ Compare temperature to baseline — rise of $\geq 1^{\circ}\text{C}$ (1.8°F) defines febrile reaction
- ▶ Assess for back pain, hemoglobinuria — these point to **hemolytic, not febrile**
- ▶ Provide warm blankets for chills (do NOT chill the patient)
- ▶ Monitor VS q15 min until stable
- ▶ Document temp curve, onset, response to antipyretic
- ▶ Reassure patient — most febrile reactions resolve within 1–2 hours

PATIENT & FAMILY TEACHING

- ▶ Febrile reactions are common and usually **not dangerous**, but always report fever, chills, or shaking
- ▶ Future transfusions: **premedication with acetaminophen** $\pm$ diphenhydramine 30 min before may be ordered
- ▶ **Leukocyte-reduced (filtered)** blood products will be requested for future transfusions
- ▶ Take temperature at home if you feel feverish in the 6 hours after a transfusion and call the clinic

Anaphylactic Transfusion Reaction

IGE / IGA-MEDIATED · AIRWAY EMERGENCY

★★★ EMERGENCY

MANAGEMENT

- ▶ **Stop transfusion** — saline via new tubing
- ▶ **EPINEPHRINE IM (1:1,000)** — first-line drug, 0.3–0.5 mg adult, may repeat q5–15 min
- ▶ Maintain airway: **high-flow O₂**, prepare for intubation
- ▶ Trendelenburg position if hypotensive
- ▶ IV fluids (NS) wide open for vasodilation/shock
- ▶ Adjuncts: **diphenhydramine (Benadryl)**, **corticosteroids** (methylprednisolone), bronchodilators (albuterol nebulizer)
- ▶ Vasopressors if refractory hypotension

NURSING CARE

- ▶ **Call rapid response / code** — do not leave bedside
- ▶ Continuous SpO₂, ECG, BP monitoring
- ▶ Listen for **stridor, wheezing**; assess for tongue/lip swelling
- ▶ Have **crash cart + intubation tray** at bedside
- ▶ Document trigger, onset, drugs given, response
- ▶ Once stable, screen for **IgA deficiency** — future units must be **washed RBCs** or from IgA-deficient donors

PATIENT & FAMILY TEACHING

- ▶ Wear a **medical alert bracelet** stating "anaphylaxis to blood products" or "IgA deficiency" if confirmed
- ▶ Carry an **epinephrine auto-injector** if prescribed; teach proper technique and to call 911 even after using it
- ▶ Future transfusions require **washed RBCs / IgA-deficient plasma**; report your history every time
- ▶ Symptoms of recurrence to watch for at home: throat tightness, hives, dizziness, wheezing — call 911 immediately
- ▶ Premedication with antihistamines + steroids may be ordered before any future blood product

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Pharmacology Quick-Reference

DRUGS USED IN REACTION MANAGEMENT

Drug / Class	Mechanism	Reaction Use	Key Side Effects	Nursing Considerations
Epinephrine Sympathomimetic	α & β agonist — vasoconstriction, bronchodilation, $\uparrow$ HR/contractility	Anaphylactic — first-line	Tachycardia, tremor, anxiety, hypertension, arrhythmia	IM (anterolateral thigh) preferred for anaphylaxis · monitor ECG · repeat q5–15 min PRN
Diphenhydramine H1-blocker	Blocks histamine at H1 receptor → $\downarrow$ itch, $\downarrow$ urticaria	Anaphylactic / allergic — adjunct (NOT first-line)	Sedation, dry mouth, urinary retention	Not a substitute for epinephrine · IV push slowly · fall precautions
Methylprednisolone Corticosteroid	Suppresses inflammatory cascade; prevents biphasic reaction	Anaphylactic — adjunct	Hyperglycemia, immunosuppression, fluid retention	Onset is slow (hours) — does not replace epi · monitor glucose
Albuterol β_2 -agonist	Bronchodilation via β_2 receptors	Anaphylactic with bronchospasm	Tremor, tachycardia, hypokalemia	Nebulized; auscultate breath sounds before & after
Acetaminophen Antipyretic	Inhibits CNS prostaglandin synthesis → $\downarrow$ fever	Febrile — first-line antipyretic	Hepatotoxicity (max 4 g/day adult)	Often given as premedication before transfusion
Meperidine (Demerol) Opioid	Suppresses shivering reflex	Febrile — for severe rigors only	Sedation, respiratory depression, seizures (metabolite buildup)	Low dose · not for prolonged use · avoid in renal failure
Furosemide / Mannitol Diuretics	Promote urine flow to flush hemoglobin from tubules	Hemolytic — preserve renal function	Hypokalemia, hypotension, ototoxicity (high-dose furosemide)	Strict I&O · monitor K ⁺ , BP · patent IV mandatory

Drug / Class	Mechanism	Reaction Use	Key Side Effects	Nursing Considerations
0.9% Normal Saline Crystalloid	Volume expansion; isotonic; only fluid compatible with blood	All — KVO + resuscitation	Fluid overload (caution: HF, kidney disease)	Always use NEW tubing after a reaction · never D5W with blood

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NCLEX Test Traps

COMMON MISTAKES VS. PRIORITY ANSWERS

✗ TRAP

"Slow the rate down"

Slowing a reacting transfusion lets **more incompatible blood** enter the patient. Always **STOP** the unit completely — never just slow it.

✓ PRIORITY

STOP the transfusion first

Then saline via new tubing, assess, notify, send samples. The *order* matters on NCLEX.

✗ TRAP

"Disconnect the IV"

Never lose IV access. The patient may need emergency drugs (epi, fluids, vasopressors). Keep the line open with **NS**.

✓ PRIORITY

Maintain IV with NS via NEW tubing

New tubing prevents infusing residual blood from the contaminated line. Hub the saline directly to the catheter.

✗ TRAP

"Give Benadryl first" (anaphylaxis)

Diphenhydramine is an **adjunct**. The first drug for anaphylaxis is **EPINEPHRINE IM**, not Benadryl, not steroids.

✓ PRIORITY

Epinephrine IM — first-line

0.3–0.5 mg of 1:1,000 IM (anterolateral thigh). May repeat q5–15 min. ABCs always come first.

✗ TRAP

"It's just a fever — keep going"

You cannot tell febrile from hemolytic at onset — both can start with fever and chills. **Always stop first** until ruled out.

✓ PRIORITY

Stop, assess, rule out hemolytic

Look for back pain, hemoglobinuria, hypotension. If clear → may resume per HCP. Never assume it's "just" febrile.

✗ TRAP

"Hang the unit with D5W"

Dextrose causes **RBC lysis/clumping**. Will trigger or worsen hemolysis. NEVER mix blood with anything but **0.9% NS**.

✓ PRIORITY

0.9% Normal Saline only

Only saline is compatible with blood. No medications, no D5W, no LR (calcium binds citrate).

✗ TRAP

"Discard the blood bag"

The bag and tubing must go to the **blood bank** for analysis. Send blood and urine samples. Never throw it out.

✓ PRIORITY

Return bag + tubing + samples

Required for retyping, recrossmatch, and hemoglobinuria check (urine).

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Patient & Family Education

WHAT TO TEACH BEFORE, DURING, AND AFTER TRANSFUSION

✓ Before the transfusion

- Verify identity — speak your name and DOB out loud
- Report any prior transfusion reactions or allergies
- Empty bladder before starting (4-hour infusion ahead)
- Premedication may be ordered if you have a history of reactions

✓ During the transfusion

- Use the call light **immediately** for ANY new symptom: back pain, chills, itching, dizziness, anxiety, "feeling weird"
- Nurse will stay with you the first 15 minutes
- Vital signs will be checked frequently — this is normal
- Maximum infusion time: 4 hours per unit

✓ After the transfusion

- Reactions can occur up to **6 hours after** the unit ends (febrile) — report fever, chills, dark urine, back pain
- Anaphylaxis can be biphasic — symptoms returning hours later require 911
- Blood pressure and labs may be rechecked
- Drink fluids unless restricted; rest

✓ If you've had a reaction

- Wear a **medical alert ID** stating reaction type
- Tell every provider before any future transfusion
- Future units may be **leukocyte-reduced** (febrile), **washed** (anaphylactic/IgA), or **extended crossmatched** (hemolytic)
- Carry an EpiPen if prescribed; learn proper technique

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Memory Boosters

MNEMONICS & PATTERN RECOGNITION

STOP

UNIVERSAL FIRST RESPONSE

S — Stop the transfusion

T — Tubing — new + saline

O — Observe + assess (VS, ABCs)

P — Provider + blood bank notified

FAB

THREE REACTIONS, THREE SIGNS

Febrile → **F**ever / chills

Anaphylactic → **A**irway swelling, wheeze

Blood (hemolytic) → **B**ack pain, dark urine

15 / 50 / 4

THE TRANSFUSION SAFETY NUMBERS

15 min — stay at bedside

50 mL — most reactions occur within

4 hr — maximum infusion time per unit

"BACK + DARK = BAD"

HEMOLYTIC REACTION RED-FLAG COMBO

Back pain (low/flank)

Anxiety / sense of doom

Chills + chest tightness

Kidney signs (oliguria)

Dark urine (hemoglobinuria)

ABO mismatch — clerical error

Rapid onset (within 50 mL)

Killer — DIC, AKI, shock

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NCJMM Clinical Judgment Scenario NGN 6-step model in action

CASE STUDY

A 62-year-old female with anemia is receiving her first unit of PRBCs. She received 35 mL when she states, "My back hurts and I feel really anxious." Vitals: T 100.8°F (was 98.9°F), HR 122, BP 92/56 (was 128/78), RR 24, SpO₂ 96%. Urine in the Foley appears dark red. Chills are visible.

1

RECOGNIZE CUES

Low back pain, anxiety, ↑T, ↑HR, ↓BP, dark urine, recent transfusion start, 35 mL infused. Cue cluster screams **hemolytic reaction**.

2

ANALYZE CUES

Constellation of back pain + hemoglobinuria + hypotension + fever + tachycardia within 50 mL = ABO incompatibility with intravascular hemolysis. Risk of **AKI, DIC, shock**.

3

PRIORITIZE HYPOTHESES

#1 Acute hemolytic reaction (highest risk → death). #2 Sepsis/bacterial contamination. #3 Anaphylaxis (less likely without airway/skin signs).

4

GENERATE SOLUTIONS

STOP transfusion → NS via new tubing → call HCP/blood bank → VS q15 min → strict I&O → send blood/urine to lab → return bag → anticipate diuretics, fluids, possibly vasopressors.

5

TAKE ACTIONS

Clamp blood. Hang 0.9% NS via new tubing at hub. Stay with patient. Call rapid response. Position supine, give O₂. Document time/symptoms. Verify unit ID against patient — clerical error?

6

EVALUATE OUTCOMES

BP stabilizes $\geq 90/60$, urine output ≥ 30 mL/hr, no bleeding (DIC ruled out), labs normalize (H&H, BUN/Cr, coags).
Patient verbalizes understanding of need for medical alert ID for future transfusions.

Diane's NGN NCLEX 2026 Study Series

Transfusion Reactions · Hematology · Pharmacology · Patient Safety · Clinical Judgment