Blood products and transfusion reactions

Compatibility, safe checks, monitoring, and reactions

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1 AT A GLANCE

A transfusion can save a life, and a mismatched unit can end one. At the bedside, the nurse is the last check.

Red cell compatibility

Client's type	Can receive
A	A or O
B	B or O
AB	A, B, AB or O: no anti-A or anti-B
★ **O**	**Only O**: it carries both antibodies
Rh-negative	Rh-negative red cells preferred, especially with childbearing potential; emergency protocols may use Rh-positive

Red cells only: Plasma and platelets follow different compatibility rules. Don't delay a lifesaving transfusion.

ABO, Rh and the crossmatch

- Blood groups come from A and B antigens on red cells. People carry antibodies against the antigens they lack.
- Mismatched blood is attacked, and the red cells burst: that's hemolysis, and an ABO mismatch can be fatal.
- Rh means the D antigen. Rh-negative people have no anti-D until they're exposed; a later exposure can cause severe hemolysis.
- A type and screen finds the group, the Rh type and unusual antibodies; a crossmatch also tests a specific donor unit. Typing sample: **within 72 hours**, or as your policy states.

Blood products

Product	Used for
★ **Red cells**	Oxygen-carrying capacity, for bleeding or symptomatic anemia. One unit typically raises hemoglobin about 1 g/dL in an adult; the effect varies with active bleeding. **Consider below 7 g/dL in most stable adults, individualized**; 8 g/dL may suit heart disease, 7.5 g/dL cardiac surgery
Fresh frozen plasma	Clotting factors: for bleeding, or to bring a high INR down quickly
Platelets; cryoprecipitate	A low or poorly working platelet count. Cryoprecipitate supplies fibrinogen, as in massive bleeding or DIC
Albumin	Expands volume, as in burns, when salt solutions aren't enough
Leukocyte-reduced; autologous	Leukocyte-reduced cells help clients who had a fever reaction before. Autologous blood is the client's own, collected ahead of surgery

Before you start

- Confirm written consent, unless it's an emergency. Some clients, like Jehovah's Witnesses, decline blood: follow policy.
- Verify the order and any premedication; ask about allergies and past reactions. Acetaminophen and diphenhydramine are common premeds after a past reaction; furosemide may be ordered in heart failure.
- ★ **Fever over 100.4 °F, or abnormal vital signs? Call the provider before you get the blood**: it can't go back.
- Use a 20 to 24 gauge catheter, or 18 to 20 for a rapid transfusion.
- ★ Prime filtered blood tubing with **normal saline, the standard**; albumin or ABO-compatible plasma may be allowed, per product and policy. Dextrose, lactated Ringer's, parenteral nutrition and medicines don't go in the blood line.

Bedside check and monitoring

- Start **within 30 minutes of pickup**. Don't keep blood in the unit fridge or shake it; warm it only in a blood warmer, if ordered.
- ★ **Two people check at the bedside**: the order, two identifiers on the wristband against the bag, group, Rh, unit number and expiry. Inspect the bag too.
- Baseline vital signs, with lung sounds, within 15 minutes before starting.
- ★ Start slowly, about 2 mL a minute, and **stay with the client for the first 15 minutes**, when most reactions happen.
- Recheck vital signs at 15 minutes, then raise the rate so the unit **finishes within 4 hours**.
- Teach the client to report chills, itching, hives, shortness of breath or chest pain right away.
- Afterwards: compare vital signs to baseline, flush with saline, and teach the signs of a delayed reaction.

Educational use only. Not a substitute for clinical judgment, your facility's policy or the provider's orders. Where practice varies, follow facility policy and state law. No patient information.

Blood products and transfusion reactions

1 AT A GLANCE, CONTINUED

Transfusion reactions

Reaction	Clues	Then
★ **Acute hemolytic (mismatch)**	Starts **within minutes**: fever, chills, **low back pain**, a fast pulse, low pressure	Send blood and urine samples to the lab, with the bag and tubing
Febrile (among the most common, with allergic reactions; donor white cells)	Fever and chills	Antipyretics as ordered
Allergic	Itching and hives; anaphylaxis adds wheezing and low pressure	Anaphylaxis: epinephrine as ordered
TACO (fluid overload)	Crackles, breathlessness, **high pressure**, neck vein distension; mostly older and heart or kidney clients	Stop the transfusion, sit the client up, give oxygen; a diuretic as ordered
TRALI (lung injury from donor antibodies)	**Low oxygen and low pressure**; fever	Oxygen; prepare for intubation
Septic (contaminated blood)	High fever, low pressure	Cultures and antibiotics follow

Any suspected reaction: Stop the transfusion first. Keep the vein open with normal saline through new tubing, not the old tubing, which would push more blood in. Urgently notify the provider and blood bank, and follow the reaction policy.

2 PRIORITY AND SAFETY CALLS

★ Ten minutes in, low back pain and chills: **stop the transfusion**. Early back pain and chills suggest a hemolytic reaction.

★ Stop, don't slow: slowing keeps the possibly mismatched blood flowing.

After stopping, hang normal saline with new primed tubing attached at the catheter, not through the old blood tubing.

Acetaminophen treats a fever, but doesn't stop the reaction. A new unit can wait: the client comes first.

An 82-year-old with heart failure, on a second unit, develops crackles, a pounding pulse, BP 172/94 mmHg and distended neck veins: likely TACO, fluid overload.

A mismatched transfusion is a sentinel event, a serious and preventable harm. Two people check at the bedside.

You can't delegate the transfusion. Once the client is stable after 15 minutes, an assistant may take vital signs and report.

3 EXAM ANCHORS

1. The exam loves the first action.
2. Expect type O compatibility, compatible fluids, the first 15 minutes, a fever before pickup, and TACO versus TRALI.
3. TACO brings high pressure and crackles; TRALI brings low oxygen and low pressure.
4. For red cells: type O receives only O, type AB any, and Rh-negative gets negative when possible, without delaying lifesaving blood.
5. Consent, a two-person check, saline as the standard fluid, and start within 30 minutes. Start slow, stay 15 minutes, finish within 4 hours.
6. Traps: slowing instead of stopping, saline through the old tubing, medicine in the blood line, and leaving the room early.

4 SELF-QUIZ

1. Type O can receive red cells only from type _____.
2. The typing sample must be drawn within the past _____ hours, or as your policy states.
3. Start the transfusion within _____ minutes of pickup.
4. Stay with the client for the first _____ minutes.
5. A unit must finish within _____ hours.
6. Prime the tubing with 0.9% normal _____.
7. Febrile and allergic reactions are among the most _____ transfusion reactions.
8. In most stable adults, consider red cells below a hemoglobin of _____ g/dL, individualized.

ANSWER KEY 1. O · 2. 72 · 3. 30 · 4. 15 · 5. 4 · 6. saline · 7. common · 8. 7

5 SOURCES

1. Open RN, Nursing Advanced Skills, 3.2 Basic Concepts (blood products). wtcs.pressbooks.pub/nursingadvancedskills/chapter/3-2-b…
2. Open RN, Nursing Advanced Skills, 3.3 Applying the Nursing Process. wtcs.pressbooks.pub/nursingadvancedskills/chapter/3-3-a…
3. Open RN, Nursing Advanced Skills, 3.4 Checklist for Administration of Blood Products. wtcs.pressbooks.pub/nursingadvancedskills/chapter/3-4-c…
4. Canadian Blood Services, Clinical Guide to Transfusion: Blood administration. professionaleducation.blood.ca/en/transfusion/clinical-guide/blood…
5. AABB, Updates in red blood cell transfusion thresholds. aabb.org/docs/default-source/default-documen…
6. Australian Red Cross Lifeblood, What can cause adverse events. lifeblood.com.au/health-professionals/clinical-pract…

Built from RN PocketPal course lessons: Blood products and transfusion reactions (c05-l18). Every line on this sheet comes from those lesson scripts.

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