Transfusion Reactions

Stop the transfusion, keep the line · Then work out which reaction this is

TACO > TRALI
commoner, and treatable

THE FIRST 60 SECONDS *identical for every reaction*

STOP AND ASSESS

Stop the transfusion immediately but **keep the intravenous line open with saline** — you may need it urgently. **Check the patient's identity against the unit** right there at the bedside; misidentification is the root cause of the most lethal reaction.

ASSESS AND ESCALATE

ABC, full observations, and examine. Fever, rigors, hypotension, breathlessness, rash, loin or infusion-site pain, and urine color. **Escalate early** — the severe reactions declare themselves within minutes.

INFORM AND SEND

Contact the transfusion laboratory immediately and return the unit and giving set. Send **repeat group and crossmatch, direct antiglobulin test, complete blood count, renal function, LDH, haptoglobin, coagulation and blood cultures**, plus a urine sample for hemoglobin.

IDENTIFY THE REACTION *fever, breathlessness or rash points you down different paths*

Reaction	Recognition	Action
Acute hemolytic ABO incompatibility	**Within minutes.** Fever, rigors, **loin or infusion-site pain**, hypotension, dark urine, bleeding from DIC. **Positive DAT, hemoglobinuria.**	**The most lethal, and almost always a clerical error.** Stop, resuscitate aggressively with fluids, support renal output, treat DIC and hyperkalemia. **Report as a critical incident.**
Febrile non-hemolytic	**The commonest.** Fever and rigors without hemodynamic compromise or hemolysis.	A diagnosis of exclusion — **exclude hemolysis and bacterial contamination first**. Acetaminophen; transfusion may be cautiously restarted in mild cases.
Allergic / anaphylactic	Urticaria alone, or full **anaphylaxis** with wheeze, angio-edema and shock. Severe reactions raise the question of **IgA deficiency**.	Mild urticaria — antihistamine and cautious restart. **Anaphylaxis — intramuscular epinephrine** and standard management; do not restart.
Bacterial contamination	**High fever, rigors and rapid shock during or soon after transfusion.** Highest risk with **platelets**, which are stored at room temperature.	**Blood cultures from the patient and the unit**, broad-spectrum antibiotics immediately, and full sepsis management.
Delayed hemolytic	**Days to two weeks later** — falling hemoglobin, jaundice, rising LDH, positive DAT, from an anamnestic antibody response.	Usually supportive. **Document the antibody** so future units are matched — this is the whole point.

TACO vs TRALI *both cause breathlessness after transfusion, and the treatments oppose each other*

	TACO	TRALI
Mechanism	**Hydrostatic (cardiogenic) pulmonary edema** from volume overload	**Permeability (non-cardiogenic) pulmonary edema** from donor antibodies and neutrophil activation
Timing	During or within hours; the revised definition **widened the time frame**	**Within 6 hours** of transfusion
Clues	**Hypertension**, raised JVP, positive fluid balance, **raised BNP**, S3, responds to diuresis. Risk factors: cardiac or renal impairment, elderly, small body size, rapid transfusion	**Hypotension**, fever, **normal JVP and no evidence of circulatory overload**, BNP not raised, transient leukopenia. Bilateral infiltrates with normal filling pressures
Treatment	**Diuretics**, oxygen, sit upright, slow or stop further transfusion	**Supportive and lung-protective ventilation. Diuretics do not help and may harm** — this is not fluid overload
Prevent it	**TACO is largely preventable** — transfuse one unit at a time, slowly, in at-risk patients, reassess between units, and consider a prophylactic diuretic	Report to the blood service so the implicated donor can be investigated and deferred

PREVENT THEM *most reactions are a prescribing or process problem*

Measure	Detail
Transfuse only when indicated	**Restrictive thresholds** — generally a hemoglobin around **7 g/dL** in the stable patient, higher in acute coronary syndrome. **The safest transfusion is the one not given**, and liberal transfusion has repeatedly failed to show benefit.
Single-unit policy	**Transfuse one unit, then reassess** clinically and with a repeat hemoglobin in the non-bleeding patient. This alone substantially reduces TACO and unnecessary exposure.
Slow it down in at-risk patients	Elderly, small body size, cardiac or renal impairment, and positive fluid balance. Consider a **prophylactic diuretic** between units and prescribe a longer infusion time.
Get the identity check right	**Positive patient identification at the bedside**, against the unit and the compatibility label, by the person hanging the blood. **This is the single control that prevents fatal ABO-incompatible transfusion.**
Special requirements	Know which patients need **irradiated** components (severe T-cell immunodeficiency, some transplant and purine-analogue recipients) or **CMV-negative** products. **Missing these is a preventable serious incident.**

PEARLS & PITFALLS

- **Check the identity at the bedside, against the unit.** Acute hemolytic reactions are clerical errors, and the check is what prevents them.
- **Keep the line open with saline.** Stopping the transfusion and losing access in a shocked patient is a bad half-hour.
- **TACO is far commoner than TRALI** and is one of the leading causes of transfusion-related death — and it is preventable.
- **Do not diurese TRALI.** It is permeability edema, and the patient is often hypotensive and intravascularly deplete.
- **Fever with platelets should raise bacterial contamination** — culture the unit as well as the patient.
- **Transfuse one unit at a time and reassess.** Single-unit transfusion in the stable patient prevents a large share of these reactions entirely.

References: ISBT/IHN/AABB revised surveillance case definition of transfusion-associated circulatory overload (2018) · consensus redefinition of transfusion-related acute lung injury (Transfusion, 2019) · national hemovigilance reporting guidance.

Educational aid; verify against local transfusion policy and patient factors.