Blood Products, Transfusion Reactions, Massive Transfusion

YOU SHOULD BE ABLE TO

- ✓ Describe each blood component: contents, storage, expected increment, and ABO rules
- ✓ Recognize the acute transfusion reactions and start the right management
- ✓ Run a massive transfusion: ratios, calcium, TXA, warming, and lab guidance

THE LESSON ON ONE PAGE

Products

- PRBC 1 to 6 °C, 42 d; +1 g/dL
- Plasma -18 °C, 1 yr; 10 to 15 mL/kg
- Platelets 20 to 24 °C, 5 d; +30 to 60k
- Cryo: fibrinogen, VIII, vWF, XIII; 1 unit/10 kg

Compatibility

- Cells: O negative universal
- Plasma: AB universal (low-titer A backup)
- Screen = unexpected antibodies
- Immediate spin = ABO check

Reactions

- STOP, then find the clue
- Under GA hemolysis: low BP, red urine, oozing
- IgA deficiency: anaphylaxis, epinephrine
- TRALI low BP; TACO high BP, diurese
- TA-GVHD: irradiate

Massive transfusion

- 10 units/24 h or 3 units/1 h
- 1:1:1, limit crystalloid
- TXA 1 g + 1 g within 3 h
- Calcium, warm everything, TEG or ROTEM

KEY TABLES

ABO and Rh

RECIPIENT	ANTIBODIES IN PLASMA	CAN GET RED CELLS FROM	CAN GET PLASMA FROM
O	Anti-A, anti-B	O only	O, A, B, AB
A	Anti-B	A, O	A, AB
B	Anti-A	B, O	B, AB
AB	None	AB, A, B, O	AB only

TRALI vs TACO

	TRALI	TACO
Blood pressure	Often low	Often high
Filling pressures, BNP	Normal	High
Treatment	Supportive: O2, lung-protective ventilation; avoid diuretics	Stop, sit up, O2, diuretic
Prevention	Male-predominant plasma donors	Slow rates, single units, watch fluid balance

BOARD TRAPS

"Leukoreduction prevents transfusion-associated GVHD."

False. Leukoreduction leaves enough T cells to cause it. Only **irradiation** (or pathogen reduction) prevents TA-GVHD. Leukoreduction lowers febrile reactions, HLA sensitization, and CMV transmission.

"Pulmonary edema after transfusion: give furosemide."

Only for TACO. In **TRALI** the patient is often hypotensive with normal filling pressures, and a diuretic can worsen shock. Look at the BP, BNP, and fluid balance first.

"Group O is the universal donor."

For red cells only. Group O plasma carries anti-A and anti-B. The universal **plasma** donor is **AB**, with low- titer A as the common trauma substitute.

"You'll know a hemolytic reaction by the back pain and chills."

Not under general anesthesia. The patient can't report pain or dread. Look for unexplained **hypotension**, **hemoglobinuria**, and new **oozing** from the field.

MEMORY DEVICES

First moves in any acute reaction

S T O P

- **S** Stop the unit; keep the IV open with saline and new tubing
- **T** Treat the patient: airway, O2, fluids, pressors
- **O** Own the paperwork: recheck patient ID against the bag
- **P** Package the bag and blood samples for the blood bank

Universal donors

O gives cells, AB gives plasma

- **O** O negative red cells go to anyone
- **AB** AB plasma goes to anyone
- **Flip** Flip it for recipients: AB positive takes any red cells; O takes any plasma

TACO vs TRALI

Too much vs Trouble

- **TACO** Too much volume: hypertension, high filling pressures, high BNP, better with diuretics
- **TRALI** Trouble in the capillaries: hypotension, fever, normal filling pressures, supportive care
- **Both** Hypoxemia and bilateral infiltrates within hours of transfusion