Blood components: Indications and dosing in adults

Component (volume)	Contents	Indications and dose
Whole blood (1 unit = 500 mL)*	RBCs, platelets, plasma	▪ Rarely required. ▪ May be appropriate when massive bleeding requires transfusion of more than 5 to 7 units of RBCs (increasingly used in early trauma management).
RBCs in additive solution (1 unit = 350 mL)	RBCs	▪ Anemia, bleeding. ▪ The increase in hemoglobin from 1 unit of RBCs will be approximately 1 g/dL; the increase in hematocrit will be approximately 3 percentage points.
FFP or other plasma product¶ (1 unit = 200 to 300 mL)	All soluble plasma proteins and clotting factors	▪ Bleeding or expected bleeding (eg, emergency surgery) in individuals with deficiencies of multiple coagulation factors (eg, DIC, liver disease, massive transfusion, anticoagulation with warfarin or warfarin overdose if not corrected by vitamin K and/or PCC, depending on the clinical setting). ▪ Bleeding in individuals with isolated factor deficiencies (most often factor V) if a factor concentrate or recombinant factor is not available. ▪ Therapeutic plasma exchange in TTP (as a source of ADAMTS13). ▪ In the rare event that FFP is used to replace a clotting factor, the dose is 10 to 20 mL/kg. This dose will raise the level of any factor, including fibrinogen, by close to 30%, which is typically sufficient for hemostasis.
Cryoprecipitate, also called "cryo" (1 unit = 10 to 20 mL)	Fibrinogen; factors VIII and XIII; VWF	▪ Bleeding patients with acquired hypofibrinogenemia, which may be due to cardiac surgery, liver transplant, postpartum hemorrhage, or trauma with massive transfusion. ▪ DIC. ▪ Uremia if DDAVP (desmopressin) is ineffective.

		▪ The increase in plasma fibrinogen from 1 unit of Cryoprecipitate per 10 kg body weight will be approximately 50 mg/dL. ▪ Cryoprecipitate is generally provided in pools containing 5 units, and most patients receive 1 to 2 pools.
Platelets (derived from whole blood or apheresis) (1 unit of apheresis platelets or a 5 to 6 unit pool of platelets from whole blood = 200 to 300 mL)	Platelets	▪ The platelet count increase from 5 to 6 units of whole blood-derived platelets or 1 unit of apheresis platelets will be approximately 30,000/microL in an average-sized adult.

Refer to UpToDate topics on these products and on specific conditions for details of use. Frozen blood products (FFP, Cryoprecipitate) take 10 to 30 minutes to thaw. It may take the same amount of time to perform an uncomplicated crossmatch.

DIC: disseminated intravascular coagulation; FFP: Fresh Frozen Plasma; PCC: prothrombin complex concentrate; RBCs: red blood cells; TTP: thrombotic thrombocytopenic purpura; VWF: von Willebrand factor.

* 450 mL blood and 63 mL citrate-phosphate-dextrose (CPD) anticoagulant-preservative solution

¶ Other plasma products include:
- Plasma Frozen Within 24 Hours After Phlebotomy (PF24)
- Thawed Plasma

PF24 may be used interchangeably with FFP for all of the indications listed above, with the exceptions of factor VIII deficiency or protein C deficiency, which are treated with recombinant products or plasma-derived factor concentrates. In the rare event that specific factor concentrates are unavailable and these deficiencies must be treated with a plasma product, FFP should be used.

Thawed Plasma may be used interchangeably with FFP for all of the indications listed above, with the exception of factor VIII deficiency without access to factor VIII concentrates, in which FFP should be used, or factor V deficiency, in which FFP or PF24 should be used.

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