Red Blood Cells:

- Hemoglobin less than 7 g/dL[1,2]
- Hemoglobin less than 8 g/dL if:
  - Patient with pre-existing cardiovascular disease or undergoing cardiac surgery.[1,3]
- Patient with symptomatic anemia not responsive to fluids
- Life threatening hemorrhage/massive transfusion protocol (MTP)

Note: *One unit of RBCs in an adult (or 8 mL/kg pediatric dose), should increase hematocrit by approximately 3% and hemoglobin by 1g/dL.*

Platelets:

- Platelet count </= 10k/mL prophylactically in patients with failure of platelet production[4,5]
- Platelet count </= 20k/mL with fever, or bleeding related to thrombocytopenia (petechiae, mucosal bleeding, etc.), or undergoing central venous catheter placement[6]
- Platelet count </= 50k/mL in a patient undergoing elective lumbar puncture or invasive procedure[6]
- Platelet count </=100k/mL in a patient undergoing neurosurgery
- Perioperative bleeding with thrombocytopenia and/or evidence of platelet dysfunction post-cardiac bypass[6]
- Bleeding patients with platelet dysfunction
- Life threatening hemorrhage/massive transfusion protocol (MTP)

Note: *A single apheresis unit of platelets should increase the platelet count by 30-60,000/cc*^{3} *under normal conditions. Methodist facilities only stock apheresis platelets; one apheresis unit is equivalent to a pool of six whole blood derived platelets (i.e. "six pack" of platelets).*

Plasma:

- Replacement of clotting factor if deficient in multiple factors or if factor concentrate is not available.
- Emergent reversal of Coumadin in patients who can not receive PCC
- Suspected TTP or known TTP patient as a bridge to plasma exchange
- Life threatening hemorrhage/massive transfusion protocol (MTP)

Note: *A dose of 10-15 mL/kg is usually adequate to correct a coagulopathy. One unit of frozen plasma has a volume of approximately 200-250 mL.*

Cryoprecipitate:

- Replacement of fibrinogen in patients with acquired hypofibrinogenemia (i.e. surgical bleeding or post-partum hemorrhage).[7]
- Also contains factor VIII, factor XIII, vW factor, and fibronectin.
- Ordered as individual units for pediatrics, or pre-pooled for adults (1 pool= 5 units).

The above thresholds are guidelines and do not cover all clinical scenarios. If there is a question as to the appropriateness of transfusion or a blood product, a hematology or transfusion medicine/blood bank consult may be helpful. Please contact the blood bank (4-4561) if a specialty blood product is needed.

References:

1. Carson JL, Stanworth SJ, Guyatt G, et al. Red Blood Cell Transfusion: 2023 AABB International Guidelines. *JAMA.* 2023;330(19):1892–1902. doi:10.1001/jama.2023.12914.
2. Hebert PC, Well G, Blajchman MA, et al. "A multicenter, randomized, controlled clinical trial of transfusion requirements in critical care. Transfusion requirements in critical care investigators, Canadian Critical Care Trials Group." NEJM. 1999; 340(6): 409-417.
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4. Slichter S, Kaufman R, Assmann S, et al. "Effects of Prophylactic Platelet Dose on Transfusion Outcomes (PLADO Trial)." Blood. 2008; 112(11): 285.
5. Stanworth S, Estcourt L, Powter G, et al. "A No-Prophylaxis Platelet-Transfusion Strategy for Hematologic Cancers." (TOPPS Trial). NEJM. 2013; 368: 1771-1780.
6. Kaufman R, Djulbegovic B, Gernsheimer T, et al. "Platelet Transfusion: A Clinical Practice Guideline from the AABB." Annals of Internal Medicine. 2015; 162(3): 205-213.
7. Cohn CS, Delaney M, Johnson ST, Katz LM, Schwartz J. AABB Technical Manual, 21st Ed. Bethesda, MD: AABB Press; 2023.