Introduction – Blood Transfusion Guidelines

As medical students and residents, I’m sure many of us learned that if a patient’s hemoglobin was 10.0 or lower, they needed 2 units of blood. Similarly, we learned that all protimes and platelet counts should be normalized with FFP and platelet packs respectively. Not so any more.

Multiple studies have been done over the last 15 years examining this practice. These studies have shown that transfusing relatively stable patients with a Hb. of 7.0 or more leads to worse short and long term results (as opposed to not transfusing them). Rarely are two units indicated. Lab results should be obtained after the first unit. Patients can safely undergo major procedures with INRs of up to 2.0, and platelet counts as low as 50 K.

The following is an outline of the blood transfusion guidelines adopted by the Medical Executive Committee this year. A list of over 40 references is included.

Please strongly consider following these criteria when ordering blood components for your patients. We are all here to give each of our patients the best possible care. Evidence based transfusion is one aspect of such care.
## BLOOD COMPONENT TRANSFUSION CRITERIA

St Jude Medical Center – 2014

### RED BLOOD CELLS

**Includes:**
- Leukoreduced RBCs
- Packed RBCs
- Washed RBCs
- Deglycerolized RBCs
- Autologous RBCs
- Directed Donor RBCs

*Whole Blood is generally neither indicated nor available; SJMC has a 100% leuko-reduced policy*

**Dose:**
- Adults - 1 unit RBC will increase Hgb 1.0 g/dL or increase Hct 3% in adults who are not actively bleeding or hemolyzing
- Pediatric – 8 mL/kg will increase Hgb approx 1.0 g/dL or increase Hct 3%

**One unit at a time:** repeat Hgb 15-30 min after each unit and reassess.

#### Adult Indications:
1. Hemoglobin < 7 g/dL or Hematocrit < 21%
2. Hemoglobin < 8 g/dL or Hematocrit < 24% in a patient with acute coronary syndromes
3. Rapid blood loss (>1500-2000 mL) not responding to appropriate volume resuscitation, or with ongoing blood loss.
4. Sepsis only within the first 6 hours. Target Hb 7 – 9 g/dL.
5. The patient has been determined to be normovolemic and there is evidence to support the need for increased oxygen carrying capacity as witnessed by (indicate):
   - Tachycardia, hypotension not corrected by adequate volume replacement alone

#### Neonatal Indications:
1. Hgb ≤ 8.0 in hemodynamically stable NICU pt with clinical signs of anemia such as tachycardia, tachypnea, recurrent apnea, and decreased vigor
2. Acute blood loss of >10% blood volume, or phlebotomy for lab testing with cumulative loss >10% blood vol over 1 week.
3. Hgb ≤ 13.0 and severe pulmonary or cyanotic heart disease or heart failure
4. Exchange transfusion

#### Contraindications:
1. Treatment of anemias that can be corrected medically
2. Treatment of asymptomatic anemias
3. Use as a volume expander or to increase oncotic pressure
4. Wound treatment

**Audit Criteria:**
1. Hgb > 8.0 g/dL or Hct > 24%
2. Lack of supportive documentation that transfusion indications have been met

**Selective Review:**
- Unexplained death within 24 hours after transfusion
- Evidence of adverse transfusion reaction

### PLATELETS

*All platelet transfusion at SJMC are provided as apheresis products; whole blood derived platelet concentrates are not available; SJMC has a 100% leuko-reduced policy & attempt 100% irradiated platelets*

**Dose:**
- Adults – 1 single donor platelet should increase plt ct 25K – 35K/µL
- Pediatric – 5-10 mL/kg should increase plt ct 25K – 35K/µL

**Adult Indications:**
1. Platelet count < 10K/µL prophylactically in a patient with failure of platelet production
2. Platelet count < 20K/µL and signs of hemorrhagic diathesis (petechiae, mucosal bleeding)
3. Platelet count < 50K/µL in a patient with (indicate):
   - Active hemorrhage
   - Invasive procedure (recent, in-progress, planned)
4. Platelet dysfunction as documented

**Neonatal Indications:**
1. Platelet count ≤ 20K/µL in non-bleeding pt
2. Platelet count ≤ 50K/µL and impending surgery or invasive procedure, or in a patient with active hemorrhage
3. Neonatal Necrotizing Enterocolitis (NEC)

**Contraindications:**
- Treatment of Idiopathic Thrombocytopenic Purpura (ITP), Thrombotic Thrombocytopenic Purpura (TTP), or Heparin-Induced Thrombocytopenia with Thrombosis (HITT) without life-threatening hemorrhage

**Audit Criteria:**
1. Platelet count > 20 K/µL
2. Lack of supportive documentation that transfusion indications have been met

**Selective Review:**
- Unexplained death within 24 hours after transfusion
- Evidence of adverse transfusion reaction
**THAWED PLASMA**

**Includes:**
- Fresh Frozen Plasma (FFP)
- Plasma Frozen Within 24 Hours of Collection (FP24)
- Thawed Plasma
- Plasma Cryoprecipitate-reduced (CPP)

*FP24 is equivalent to FFP; plasma orders will be filled with either product as available. CPP is indicated for TTP only.*

**Dose:**
Dependent on patient size and clinical condition; generally 10-15 mL/kg
1 unit = approx 250 mL

**Indications:**
1. INR ≥ 2.0 and invasive procedure (recent, in-progress, planned)
2. INR >1.7 and neurosurgical procedure (recent, in-progress, planned)
3. INR > 1.5 and significant hemorrhage

**Contraindications:**
1. To increase blood volume or albumin concentration
2. Coagulopathy that can be corrected more effectively with specific therapy, such as vitamin K, cryoprecipitate, or factor concentrates
3. Normalization of coagulation tests in the absence of bleeding

**Audit Criteria:**
1. INR < 1.7
2. PTT < 75 seconds
3. Lack of supportive documentation that transfusion indications have been met

**Selective Review:**
- Unexplained death within 24 hours after transfusion
- Evidence of adverse transfusion reaction

**CRYOPRECIPITATE**

*Thawed cryos are pooled in the Blood Bank to ease administration.*

**Dose:**
1 cryo per 10 kg body wt for treatment of hypofibrinogenemia will raise fibrinogen by approx 50 mg/dL

**Indications:**
1. Fibrinogen < 100 mg/dL
2. Fibrinogen < 150 mg/dL with active hemorrhage

**Contraindications:**
1. Do not transfuse cryoprecipitate unless lab studies confirm a specific hemostatic defect for which this product is indicated, e.g. fibrinogen
2. Do not transfuse with cryoprecipitate when appropriate factor concentrates are available

**Audit Criteria:**
1. Plasma fibrinogen > 100 mg/dL
2. Lack of supportive documentation that transfusion indications have been met

**Selective Review:**
- Unexplained death within 24 hours after transfusion
- Evidence of adverse transfusion reaction
References to Support Evidence Based Transfusion Guidelines

Implementing Transfusion Guidelines


Red Blood Cell Therapy


Red Blood Cell Therapy–Cardiovascular Disease


Platelet Therapy


Plasma Therapy


Cryoprecipitate Therapy