

**LSUHSC-S Transfusion Reference Guidelines
GUIDELINES FOR THE TRANSFUSION
OF BLOOD PRODUCTS**

ORDERS

Each order for transfusion of any blood product must include:

Rate of Infusion (time for infusion, all blood products must be infused over 4 hours or less)

Route of Infusion (eg, intravenous administration)

Volume of Infusion (# of units or cc's)

Call orders

Sample orders

- Transfuse 2 units of PRBCs IV over 1-2 hours per unit.
- Transfuse 1 single donor platelet unit IV over 30-90 minutes.
- Infuse 500 cc of 5% albumin IV over 30-60 minutes (albumin orders must include the volume and the percent of albumin).

Call orders

Call MD for:

- Rise in temperature of greater than 2°F
- Chills, rigors, back or chest pain, hypotension, shortness of breath or wheezing

RISKS OF TRANSFUSION

Transfusion transmitted infections³

	Estimated risks per Unit transfused	Estimated % of infected Units that transmit
Viral Infection		
HIV-1 and -2	1:1,900,000	90
HTLV-I and -II	1:641,000 (1:2,000,000-1:256,000)	30
HAV	1:1,000,000	90
HBV	1:63,000 (1:147,000-1:31,000)	70
HCV	1:1,600,000	90
Parvovirus B19	(1:40,000-1:3,300)	Low
Parasitic infection		
Babesia and malaria	<1:1,000,000	Unknown

Noninfectious acute risks

1. Fatal hemolytic transfusion reaction (1/1,300,000)
2. Febrile nonhemolytic transfusion reaction (1%)
3. Minor allergic (urticarial) reactions (1%)
4. Anaphylaxis (1/20,000-1/47,000)
5. Circulatory overload (variable)
6. Non-cardiogenic pulmonary edema/ Transfusion related acute lung injury (1/5,000)

TRANSFUSION INDICATIONS -GENERAL^{3-7,9}

Type of Unit/Condition	Indications for Usage
RBCs in adults	<ol style="list-style-type: none"> 1. Hypovolemia due to acute blood loss <ul style="list-style-type: none"> • Hypotension and tachycardia not corrected by volume replacement • 30% blood loss for otherwise healthy patients, as long as volume is maintained 2. Hb <8-10 g/dL <ul style="list-style-type: none"> • Symptomatic anemia in a euvolemic patient (angina, syncope, CHF, TIA, dyspnea, tachycardia) • Stable patients with cardiovascular risk factors* 3. Hb<7 g/dL <ul style="list-style-type: none"> • Transfusion in patients with no risk factors for ischemia
Platelets ^{4,8}	<p>Platelet count:</p> <p><10,000/uL</p> <ul style="list-style-type: none"> • Stable heme-oncology patient <p><20,000/uL</p> <ul style="list-style-type: none"> • Bone marrow aspiration and biopsy <p><50,000/uL**</p> <ul style="list-style-type: none"> • Active bleeding • DIC • Invasive procedure in cirrhosis • Liver biopsy (<50-100,000/uL) <p><60-80,000/uL</p> <ul style="list-style-type: none"> • Surgery <p><80-100,000/uL</p> <ul style="list-style-type: none"> • Neurosurgery or ophthalmic procedures • After cardiopulmonary bypass, intraaortic balloon pump placement, ECMO • Massive transfusion
Fresh Frozen Plasma	<ol style="list-style-type: none"> 1. PT>19 or PTT>53 <ul style="list-style-type: none"> • To correct coagulation factor deficiencies in a bleeding patient with multiple coagulation factor deficits (i.e. liver disease, DIC, massive transfusion) • Prior to an invasive procedure 2. Warfarin overdose or vitamin K deficiency***, when correction of coagulopathy is needed within 12-24 hr <ul style="list-style-type: none"> • bleeding patient or in a patient with a high risk of bleeding (INR>5.0) • Before an invasive procedure 3. Replacement fluid in TTP 4. Replacement in Factor V and XI deficiencies
Cryoprecipitate	<ol style="list-style-type: none"> 1. Hypofibrinogenemia -Fibrinogen <100 mg/dL <ul style="list-style-type: none"> • Massive transfusion • Congenital deficiency • Acquired deficiency (eg DIC) 2. Factor XIII deficiency 3. Uremia, with bleeding unresponsive to non-transfusion therapy (eg, dialysis, desmopressin) 4. Dysfibrinogenemia (dysfunctional fibrinogen)
*Hb 8g/dL may be adequate for most patients with stable cardio-vascular disease ³	
**Lower platelet counts may be adequate in certain cases, eg 20,000-50,000/uL for GI endoscopy in cancer or Fiberoptic bronchoscopy in BMT ⁴	
***Vitamin K may be given also; correction should occur in 24 hours (with normal liver function) ⁵	

TRANSFUSION INDICATIONS –GENERAL (p.2)

Type of Unit/Condition	Indications for Usage
Rh Immune Globulin	<ol style="list-style-type: none"> Known or suspected inoculation of Rh(-) mother with unknown or Rh(+) fetal cells <ul style="list-style-type: none"> Threatened abortion, abortion, or ectopic pregnancy Amniocentesis or PUBS Abdominal Trauma in 2nd-3rd trimester Antepartum prophylaxis at 26-28 weeks Postpartum if newborn is Rh (+) Transfusion of Rh(+) cellular blood products (e.g. platelets) to an Rh(-) female of child bearing age or younger
Albumin ^{5,7}	<ol style="list-style-type: none"> For oncotic activity in patients who are hypovolemic <i>and</i> hypoproteinemic. Specific indications include: <ul style="list-style-type: none"> shock, burns, nephrotic syndrome ascitic fluid removal liver failure (or transplant) patients severe necrotizing pancreatitis patients on enteral feedings acute respiratory distress syndrome Replacement fluid in plasma exchange for most indications
CMV-negative blood products	<ol style="list-style-type: none"> CMV-seronegative pregnant women Intrauterine transfusion Premature infants weighing <1200 g born to CMV(-) mothers CMV(-) recipients of allogeneic bone marrow transplants from CMV(-) donors CMV(-) (or CMV-status pending) candidates for allogeneic BMT
Irradiated blood products	<ol style="list-style-type: none"> BMT recipients or candidates Recipients of donation from a relative Hodgkin's Lymphoma Immune Deficiency syndromes (cellular) Neonates who receive intrauterine transfusion or exchange transfusion
Washed red cells and platelets	<ol style="list-style-type: none"> IgA deficiency with documented antibodies to IgA Neonatal alloimmune thrombocytopenia when the mother is the donor for the fetus or newborn infant
Leukoreduced products	Cellular Products (RBCs and platelets) are now all 3 log leukoreduced

PROCEDURE FOR HANDLING AND REPORTING ADVERSE REACTIONS

Signs and symptoms of transfusion reactions include

- Fever
- Chills
- Back Pain
- Dyspnea or wheezing
- Hypotension
- Hemoglobinuria
- Bleeding

Procedure

If an adverse reaction is suspected, the nursing or physician staff should stop the transfusion immediately, maintain IV access and then follow the instructions on the Transfusion Reaction Form: including collection of appropriate specimens, documentation of vital signs and other pertinent data, and immediate notification of the Blood Bank

THESE GUIDELINES AND ADDITIONAL GUIDELINES SPECIFIC TO PEDIATRICS AND SICKLE CELL ANEMIA ARE AVAILABLE ON THE LSUHSC-S WEBSITE

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TRANSFUSION INDICATIONS SPECIFIC TO PEDIATRICS ¹

Type of Unit/Condition	Indications for Usage
RBCs in patients less than 4 months of age	<ol style="list-style-type: none"> 1. Hct<20% with low reticulocyte count and symptoms of anemia 2. Hct<30% with an infant: <ul style="list-style-type: none"> • On<35% hood O2 • On O2 by nasal cannula • On CPAP and/or IMV with mechanical ventilation with mean airway pressure <6 cm H2O • With significant apnea or bradycardia • With significant tachycardia or tachypnea • With low weight gain 3. Hct<35% with an infant <ul style="list-style-type: none"> • On>35% Hood O2 • On CPAP/IMV with mean airway pressure >=6-8 cm H2O 4. Hct<45% with an infant <ul style="list-style-type: none"> • On ECMO or With congenital cyanotic heart disease
RBCs in patients greater than 4 months of age	<ol style="list-style-type: none"> 1. Significant preoperative anemia in emergency surgery or when other corrective therapy is not available 2. Intraoperative blood loss of >=15% of total blood volume 3. Hct <24% <ul style="list-style-type: none"> • In perioperative period with symptoms • While on chemotherapy/radiotherapy • Chronic congenital or acquired symptomatic anemia 4. Acute blood loss with hypovolemia 5. Hct<40% with <ul style="list-style-type: none"> • Severe pulmonary disease • ECMO 6. Sickle cell disease <ul style="list-style-type: none"> • See below, page 5 7. Chronic transfusion programs for disorders of RBC production
Platelets in children	<p>Platelet count:</p> <ol style="list-style-type: none"> 1. 5-10,000/uL with failure of platelet production 2. <30,000/uL in a neonate with failure of platelet production or in Neonatal alloimmune thrombocytopenia 3. <50,000/uL in stable premature infant: <ul style="list-style-type: none"> • With active bleeding • Invasive procedure 4. <100,000/uL in sick premature infant: <ul style="list-style-type: none"> • With active bleeding • Invasive procedure in patient with DIC • ECMO

INDICATIONS FOR RBC TRANSFUSION IN SICKLE CELL DISEASE⁹

Simple transfusion	<p>Acute anemia</p> <ul style="list-style-type: none"> • Hemoglobin decreased more than 20% from baseline • Symptomatic anemia • Hypoxia • Hemodynamic instability <p>In general, the final Hb level should not be significantly greater than the patients baseline and especially not greater than 10 g/dL to avoid acute hyperviscosity</p>
Exchange transfusion	<p>Acute indications for emergent exchange transfusion</p> <ul style="list-style-type: none"> • Cerebrovascular accident • Acute chest syndrome • Splenic sequestration • Acute multiorgan damage syndrome • Priapism <p>Chronic exchange transfusion</p> <ul style="list-style-type: none"> • To prevent recurrence of CVA • To prevent recurrence of severe or frequent splenic sequestration
<p>When the target goal of transfusion is to lower HbS, exchange transfusion is strongly recommended for patients with Hb levels over 8 g/dL, especially for Hb over 10 g/dL</p>	
Other possible indications for transfusion	<p>Preoperative transfusion</p> <ul style="list-style-type: none"> • Often recommended to raise Hb to 9-10 g/dL* <p>Pregnancy**</p> <ul style="list-style-type: none"> • Progressively severe anemia below baseline • Hypoxia • Preeclampsia • Anticipated surgical delivery • Indications for emergent exchange transfusion-same as above <p>Pain crisis</p> <ul style="list-style-type: none"> • Chronic prophylactic transfusions are recommended by some for debilitating pain crisis

* Preoperatively, simple transfusion is generally considered preferable, but double heterozygous S/C patients may do better after exchange transfusion.

**In Pregnancy: -Hb should be compared to baseline to avoid overtransfusion.
-Prophylactic transfusion is **not** generally recommended.

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