

## Transfusion Services

### BLOOD COMPONENTS GENERAL INFORMATION

#### General Information

A complete listing of the description, action, indications, side effects, dosage, and administration of blood components may be found in the "[Circular of Information for the Use of Human Blood and Blood Components](#)." This circular is available via this online link for the most current version or a copy can be obtained from the Transfusion Service. Refer to Children's [Guidelines for Transfusion of Blood Components](#).

#### ***Leukocyte Reduced Blood Cells***

**Crossmatch:**

Required for patients &gt;4 months of age

**Approximate Volume:**

320 mL (AS-1 or AS-3 additive solution)

300 mL (CPDA-1)

**Standard Transfusion Dosage:****Patient Weight:****Std Dosage:**

&lt;20 kg

10 – 20 mL/kg

20 – 40 kg

1 unit

&gt;40 kg

1 - 2 units

**Outdate:**

42 days (AS-1 or AS-3 additive solution)

35 days (CPDA-1)

**Storage Conditions:**1 - 6°C in a monitored blood refrigerator. **Do Not store on nursing ward.****Minimum Preparation Time:**

20 minutes

**Description:**

A unit of leukocyte reduced red blood cells has a hematocrit of approximately 55–70% and a red cell mass of approximately 200 mL. The component contains less than  $5 \times 10^6$  white blood cells per adult unit.

#### ***Red Blood Cells, Washed***

**Crossmatch:**

Required for patients &gt;4 months of age

<b>Approximate Volume:</b>	200 mL	
<b>Standard Transfusion Dosage:</b>	<b>Patient Weight:</b>	<b>Std Dosage:</b>
	<20 kg	10 – 20 mL/kg
	20 – 40 kg	1 unit
	>40 kg	2 units
<b>Outdate:</b>	24 hours after washing	
<b>Storage Conditions:</b>	1 - 6°C in a monitored blood refrigerator. <b>Do Not store on nursing ward.</b>	
<b>Minimum Preparation Time:</b>	3 - 6 hours. Longer time intervals will be necessary if the component is ordered at night or on weekends.	
<b>Description:</b>	A unit of Red Blood Cells that has been washed and resuspended in a saline solution.	

***Red Blood Cells, Frozen Deglycerolized***

<b>Crossmatch:</b>	Required for patients >4 months of age	
<b>Approximate Volume:</b>	200 mL	
<b>Standard Transfusion Dosage:</b>	<b>Patient Weight:</b>	<b>Std Dosage:</b>
	<20 kg	10 – 20 mL/kg
	20 – 40 kg	1 unit
	>40 kg	2 units
<b>Outdate:</b>	24 hours after deglycerolization	
<b>Storage Conditions:</b>	1 - 6°C in a monitored blood refrigerator. <b>Do Not store on nursing ward.</b>	
<b>Minimum Preparation Time:</b>	3 - 6 hours. Longer intervals will be necessary if the component is ordered at night or on weekends.	

<b>Description:</b>	A unit of Red Blood cells that was once frozen in glycerol and has subsequently been thawed, deglycerolized, and resuspended in a dextrose-saline solution.	
<b>Whole Blood</b>		
This component is not available. Please contact the Transfusion Service or Pathology staff to discuss the use of this product.		
<b>Plasma: Fresh Frozen and Frozen Plasma</b>		
<b>Crossmatch:</b>	A blood sample may be required to determine patient ABO type.	
<b>Approximate Volume:</b>	200 – 300 mL (adult)	
<b>Standard Transfusion Dosage:</b>	<b>Patient Weight:</b>	<b>Std Dosage:</b>
	<20 kg	10 – 20 mL/kg
	20 – 40 kg	1 adult unit
	>40 kg	2 adult units
<b>Outdate:</b>	24 hours after thawing	
<b>Storage Conditions:</b>	After thawing, 1 - 6°C in a monitored blood refrigerator; return to Transfusion Service immediately if not needed. <b>Do Not store on nursing ward.</b>	
<b>Minimum Preparation Time:</b>	20 - 30 minutes unless processing of a blood specimen is required	
<b>Description:</b>	Each unit of Fresh Frozen Plasma (FFP) or Frozen Plasma (FP) contains the plasma obtained by centrifugation and separation from one unit of whole blood. The plasma has been frozen within 24 hours of collection to minimize loss of coagulation factors. It has the same risk of disease transmission as Red Blood Cells. These components lack platelets.	
<b>Leukocyte Reduced Platelets, Pheresis (Single Donor Platelets)</b>		
<b>Crossmatch:</b>	A blood sample may be required to determine the patient's ABO and Rh type. Crossmatching may be requested in refractory patients.	

<b>Approximate Volume:</b>	200 – 350 mL	
<b>Standard Transfusion Dosage:</b>	<b>Patient Weight:</b>	<b>Std Dosage:</b>
	<10 kg	10 – 15 mL/kg up to 50 mL
	10 – 15 kg	⅓ pheresis unit
	15 – 25 kg	½ pheresis unit
	>25 kg	1 pheresis unit
	ECMO	15 – 20 mL/kg
<b>Outdate:</b>	5 days	
<b>Storage Conditions:</b>	20 – 24°C (room temperature) with constant, gentle agitation. <b>Do Not Refrigerate. Do Not store on nursing ward.</b>	
<b>Minimum Preparation Time:</b>	1 – 2 hours after initial order	
<b>Description:</b>	Each unit of this component is obtained by automated apheresis from one donor and contains a minimum of $3 \times 10^{10}$ platelets (the equivalent of the number platelets contained in 5 – 6 units of random donor platelets) plus 200 – 350 mL of plasma with acid citrate dextrose (ACD) as the anticoagulant. The leukocyte count is $<5 \times 10^6$ .	
<b>HLA-matched Component:</b>	HLA-matched Single Donor Pheresis Platelets are available through the Memorial Blood Center or North Central Blood Services. The patient's HLA type must be determined prior to or concurrent with the initial order. The diagnosis of this refractory state is based on both clinical considerations and the lack of the anticipated increase in the platelet count 10 minutes or 1 hour and 24 hours after transfusion with random platelets. May consider <a href="#">Platelet Crossmatch</a> as an alternative.	
<b><i>Granulocytes, Pheresis (Granulocytes)</i></b>		
<b>Crossmatch:</b>	Required for patients >4 months of age	
<b>Approximate Volume:</b>	250 – 350 mL	
<b>Standard Transfusion Dosage:</b>	To achieve $>10 \times 10^9$ PMN's/kg (start with 10 mL/kg/day)	
<b>Outdate:</b>	24 hours	

<b>Storage Conditions:</b>	20 - 24°C (room temperature). <b>Do Not Refrigerate. Do Not Agitate. Do Not store on nursing ward.</b>
<b>Minimum Preparation Time:</b>	12 – 24 hours
<b>Description:</b>	Each unit contains $1 \times 10^{10}$ granulocytes obtained from a single donor by automated apheresis. This component contains 20 – 50 mL of red cells and may contain platelets.
<b>Contraindications:</b>	<p>In general, severe reactions to transfusion of this component or absence of a therapeutic response after 14 days should prompt its discontinuance. Granulocyte transfusions also should be discontinued when the patient becomes afebrile, or when the granulocyte count exceeds <math>1.0 \times 10^9/L</math>.</p> <p>Except in unusual circumstances, granulocyte transfusions are not indicated when there is no expectation that the patient's bone marrow will recover sufficiently to produce an adequate number of endogenous granulocytes to sustain life. Granulocyte transfusions are not appropriate for patients whose life expectancy, even if no infection is present, is less than one month.</p>
<b>Availability:</b>	The component has limited availability and should be transfused as soon as available to ensure maximum benefit.
<b><i>Cryoprecipitated Antihemophilic Globulin (CRYO)</i></b>	
<b>Crossmatch:</b>	A blood sample may be required to determine the patient's ABO.
<b>Approximate Volume:</b>	10 – 20 mL per bag
<b>Standard Transfusion Dosage:</b>	1 unit/5 kg
	<1 kg = 15 mL/kg
<b>Outdate:</b>	6 hours after thawing; 4 hours after pooling
<b>Storage Conditions:</b>	20 - 24°C. <b>Do not store, transfuse immediately; Do Not Refrigerate. Do Not store on nursing ward.</b>
<b>Minimum Preparation Time:</b>	30 minutes for thawing and pooling

<b>Description:</b>	CRYO is Cryoprecipitated protein derived from the fresh plasma separated from a unit of whole blood. Each bag has approximately 100 units of Factor VIII activity, as well as approximately 170 mg of fibrinogen, suspended in 10 – 15 mL of plasma.
<b>Pooling:</b>	CRYO is thawed and pooled by Transfusion Service personnel before issue for the convenience of nursing staff to ensure nearly complete transfer of the component to the patient. CRYO must be transfused as soon as possible after thawing to ensure maximum patient benefit.
<b><i>Leukocyte Reduced Red Blood Cells, Aliquots</i></b>	
<b>Crossmatch:</b>	Required for patients older than 4 months of age. Pretransfusion testing, Newborn Workup or Type and Screen is required once per admission for infants <4 months old.
<b>Approximate Volume:</b>	Available if volume requested is <60 mL
<b>Standard Transfusion Dosage:</b>	10 – 20 mL/kg
<b>Outdate:</b>	4 hours after dispensing into a syringe
<b>Storage Conditions:</b>	1 - 6°C in a monitored blood refrigerator. <b>Do Not store on nursing ward.</b>
<b>Minimum Preparation Time:</b>	20 minutes
<b>Description:</b>	Red Blood Cells prepared from a unit of whole blood that is further divided into smaller volumes (aliquots). The hematocrit of each individual unit ranges from 55 – 70% depending on anticoagulants. Syringes are generally prepared from CPDA-1 anticoagulated Red Blood Cells with a hematocrit of approximately 65%. Dispensed into the syringe through a 150-micron filter. Syringe will be labeled as prefiltered.
<b>Availability:</b>	Orders for aliquoted units of Red Blood Cells should specify the volume required for transfusion. When components are packaged in syringes, unless otherwise requested, an additional 7 mL of component will be added routinely to the syringe to allow for transfusion tubing “dead space”.
<b><i>Plasma, Aliquots</i></b>	
<b>Crossmatch:</b>	A blood sample may be required to determine the patient's ABO

<b>Approximate Volume:</b>	60 mL maximum in syringes
<b>Standard Transfusion Dosage:</b>	10 – 20 mL/kg
<b>Outdate:</b>	4 hours after dispensing into a syringe
<b>Storage Conditions:</b>	After thawing, 1 - 6°C in a monitored blood refrigerator. <b>Do Not store on nursing ward.</b>
<b>Minimum Preparation Time:</b>	15 – 40 minutes for thawing and syringe preparation
<b>Description:</b>	<a href="#">(See Fresh Frozen Plasma/Frozen Plasma)</a> Dispensed into the syringe through a 150-micron filter. Syringe will be labeled as prefiltered.
<b>Availability:</b>	Orders for aliquoted units of FFP/FP should specify the volume required for transfusion. When components are packaged in syringes, unless otherwise requested, an additional 7 mL of component will be added routinely to the syringe to allow for transfusion tubing “dead space”.

### ***Leukocyte Reduced Platelets, Aliquots***

<b>Crossmatch:</b>	A blood sample may be required to determine the patient's ABO and Rh.	
<b>Approximate Volume:</b>	60 mL maximum in syringes	
<b>Standard Transfusion Dosage:</b>	<10 kg (patient weight)	10 - 15 mL/kg up to 50 mL
	ECMO	15 – 20 mL/kg
<b>Outdate:</b>	4 hours after dispensing into a syringe	
<b>Storage Conditions:</b>	20 – 24°C (room temperature) with constant, gentle agitation. <b>Do Not Refrigerate. Do Not store on nursing ward.</b>	
<b>Minimum Preparation Time:</b>	20 – 30 minutes syringe preparation	
<b>Description:</b>	Will be prepared from Leukocyte Reduced Platelet Pheresis products. (See descriptions above). Dispensed into the syringe through a 150-micron filter. Syringe will be labeled as prefiltered.	

<b>Availability:</b>	Orders for aliquoted platelets should specify the volume required for transfusion. When components are packaged in syringes, unless otherwise requested, an additional 7 mL of component will be added routinely to the syringe to allow for transfusion tubing “dead space”.
<b><i>Cryoprecipitate, Aliquots</i></b>	
<b>Crossmatch:</b>	A blood sample may be required to determine the patient’s ABO.
<b>Approximate Volume:</b>	60 mL maximum in syringes
<b>Standard Transfusion Dosage:</b>	1 unit/5 kg
	<1 kg = 15 mL/kg
<b>Outdate:</b>	4 hours after dispensing into a syringe
<b>Storage Conditions:</b>	After thawing, 1 - 6°C in a monitored blood refrigerator. <b>Do Not store on nursing ward.</b>
<b>Minimum Preparation Time:</b>	15 – 40 minutes for thawing and syringe preparation
<b>Description:</b>	( <a href="#">See Cryoprecipitated Antihemophilic Globulin</a> ) Dispensed into the syringe through a 150-micron filter. Syringe will be labeled as prefiltered.
<b>Availability:</b>	Orders for aliquoted units of cyro should specify the # of units required for transfusion. <b>No extra volume</b> will be added to allow for transfusion tubing “dead space”.
<b><i>Rho (D) Immune Globulin (RHIG)</i></b> - Contact Children’s Pharmacy	
<b><i>Autologous Components</i></b>	
<b>Crossmatch:</b>	Required for RBC components
<b>Approximate Volume:</b>	See individual component
<b>Standard Transfusion Dosage:</b>	See individual component
<b>Outdate:</b>	See individual component



<b>Storage Conditions:</b>	1 - 6°C in a monitored blood refrigerator. <b>Do Not store on nursing ward.</b>
<b>Minimum Preparation Time:</b>	Donations must be scheduled and units collected at least three (3) days in advanced of proposed date of use.
<b>Description:</b>	<p>Red Blood Cells collected from a patient/donor and stored for future use.</p> <p>In rare circumstances autologous blood may be frozen and stored for up to three months. There are additional fees for freezing and deglycerolization.</p>
<b><i>Directed Donor Components</i></b>	
<b>Crossmatch:</b>	Required for RBC components
<b>Approximate Volume:</b>	See individual component
<b>Standard Transfusion Dosage:</b>	See individual component
<b>Outdate:</b>	See individual component
<b>Storage Conditions:</b>	See individual component. <b>Do Not store on nursing ward.</b>
<b>Minimum Preparation Time:</b>	Three working days from the time of donation must be allowed for processing and shipping of units
<b>Description:</b>	<p>Directed Donor components refers to blood that is donated by relatives or close friends and designated for a particular patient. Numerous studies have proven directed donor blood to be no safer, and possibly less safe, than blood from volunteer donors.</p> <p>The blood suppliers handle all collecting, processing, testing and distribution of the directed donation units to Children's Transfusion Services. It takes an average of 3 days from the date of directed donation until the blood will become available to transfuse. Directed donors must meet the same requirements that are used to select other volunteer donors. The ABO and Rh of both the intended recipient and potential donor(s) must be considered in donor selection. Routinely infants less than four months old receive group O red blood cells. Additional specimen and testing is required on infants less than four months old if a group A, B or AB directed donor unit is requested for transfusion by the family.</p> <p>Collection of Directed Donor platelets is highly discouraged due to the short outdate of platelet units.</p>

<b>Indication:</b>	<p>There are few, if any, indications for the use of directed donor components. Directed Donor units are collected for patients with an anticipated blood need, at the request of the patient (parent or guardian) and the patient's physician. Directed Donor units must be fully processed, and only donor units meeting American Association of Blood Banks and Office of Biologics, Food and Drug Administration requirements may be used for transfusion.</p> <p>Due to special handling, an additional service fee is charged per unit donated. Directed donor units collected from blood relatives are irradiated to prevent post-transfusion graft-versus-host disease.</p>
<p><b><i>Varicella-Zoster ,Immune Globulin (Zoster Immune, Globulin, VZIG)</i></b> Available by prescription from the Pharmacy.</p>	
<p><b><i>Irradiated Blood Products – Red Cells or Platelets</i></b></p>	
<b>Outdate:</b>	Red Blood Cells outdating reduced to no more than 28 days post the date of irradiate or the original outdate, which even is sooner.
<b>Preparation Time:</b>	An additional 15 minutes is required to prepare irradiated components
<b>Description:</b>	Blood components exposed to approximately 2500 cGy. All components except previously frozen plasma and cryoprecipitate should be irradiated for patients meeting indications.
<b>Availability:</b>	A request for irradiated blood components is initiated by the physician caring for the patient using the Transfusion Request Order Form. The patient should receive only irradiated blood components until the physician rescinds the request by direct communication with Transfusion Service personnel.
<p><b><i>Albumin/5% or 25%</i></b> - Available from pharmacy. Use Pharmacy Albumin Request Form.</p>	
<p><b><i>Factor Concentrates/Immune Globulins</i></b> -Coagulation factor concentrates and other immune serum globulins are available by prescription from the Pharmacy.</p>	
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