All requests for Transfusion Services must be submitted on an “Outpatient Transfusion” form (see following example). Verbal orders will not be processed until the written order is received; verbal orders from Surgery and/or verbal orders for uncross-matched blood are the only exception.

Telephone

- Laboratory: (831) 625-4811
- Transfusion: (831) 625-4855
- Transfusion fax: (831) 620-1312

Hours of Service

24 hours/day, 7 days/week

Services Available

The Outpatient Transfusion Form must be complete with the following:

- Patient’s full legal name and a secondary identifier such as medical record number or social security number, or date of birth
- Billing information
- Patient’s date of birth
- Date and time product (platelets, cryoprecipitate, frozen plasma) is needed (some products have a 24-hour expiration and will not be available if date needed is not accurate)
- Diagnosis – ICD-9 or narrative
- Priority of request
- Full name of attending or ordering physician
- Physician or authorized signature
- Patient location
- Date and time blood specimen was collected

For Blood Transfusion Candidates (type and screen, crossmatch, or hold clot order), the following is also required:

- Blood Bank wristband number
- Signature of person who identified/banded patient and collected specimen
- Number of units
- Type of blood product
- Location of transfusion
- When needed (date and time)
• Special unit request (auto or directed, CMV negative, irradiated)

*If you have any questions, please call 625-4811 and ask for Transfusion Services.*

*All information must be complete and accurate.*

**PATIENT IDENTIFICATION AND LABELING OF SPECIMENS**

Specimens submitted to Blood Bank require careful identification and labeling to ensure the results for these critically important tests involving blood typing are accurate. Such orders include:

- **Type and crossmatch** – band patient (Transfusion Candidate)
- **Type and screen** – band patient (Transfusion Candidate)
- **Hold clot** – band patient (Transfusion Candidate)
- **Blood type (ABO/Rh)**
- **Component request** (not necessary to band patient)
  - Rh immune globulin
  - Platelets
  - Cryoprecipitate
  - Frozen plasma

**COMPATIBILITY TESTING**

**Routine**

ABO Rh type: To provide compatible blood

Antibody Screen: To detect antibodies to red cell antigens other than ABO and provide compatible blood.

**Crossmatch**

**Emergency**

Compatibility testing may be bypassed if the potential harm of a transfusion delay outweighs the hazard of a possible transfusion reaction (eg, patient of unknown ABO type in shock). Uncrossmatched blood is available within 5 minutes and consists of O negative RBCs. Once the patient's type is known, type-specific blood will be issued.
If urgent transfusion with uncrossmatched blood is required, an Authorization to Release Uncrossmatched Blood form will be sent to (and is required to be signed by) the requesting physician and returned to Transfusion Service.

Turnaround Times (TAT) for Fully Crossmatched Red Blood Cells

<table>
<thead>
<tr>
<th>Type</th>
<th>Blood products usually available within</th>
<th>TAT can vary greatly in patients with antibodies and/or those requiring special blood products. Consultation with Transfusion Service is recommended.</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>75 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Urgent</td>
<td>2 hours</td>
<td>1</td>
</tr>
<tr>
<td>Routine</td>
<td>4 hours</td>
<td>1</td>
</tr>
</tbody>
</table>

Issuing Blood Components

Trained nursing staff must bring patient's full name and handwritten wristband number recorded from the patient's wrist to Transfusion Services for all red cell products. Patient's full name and secondary identifier must be brought for all other blood products.

Return of Unused Components

All unused components may be returned to the laboratory within 30 minutes of issue for subsequent reissue to the same patient or to other patients. Blood components returned after 30 minutes shall be discarded.

Blood Administration

Before starting the transfusion, compare the name and the wristband number of the patient with the name and wristband number on the blood bag. These must be identical. Refer to administering blood and blood components in the nursing manual.

All blood components must be transfused through a blood administration filter. Medications must not be added to the blood component container, or I.V. tubing, prior or during transfusion. Only normal saline may be added to blood components to facilitate transfusion. All blood components should be completely transfused within 4 hours of issue from Transfusion Service. After transfusion, all component containers must be disposed of as biohazard waste in appropriately labeled containers. The product chart copy must be completed and placed in the patient's medical record.
Standard Blood Components

Most blood components are supplied by Community Hospital of the Monterey Peninsula (CHOMP) Blood Center. Patients who elect to use either autologous or directed (designated) blood transfusions should contact CHOMP blood center to make appropriate arrangements. For CHOMP Blood Center information, call 625-4814.

Table 1.

<table>
<thead>
<tr>
<th>Component</th>
<th>Unit Volume</th>
<th>Therapeutic Indication</th>
<th>Therapeutic Impact / Unit</th>
<th>Approximate Emergency Dose</th>
<th>Preparation and/or Compatibility Testing Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red blood cells</td>
<td>250 mL†</td>
<td>Anemia</td>
<td>† Hgb ~1 g/dL</td>
<td>Determined by degree of anemia</td>
<td>Type and crossmatch (75 minutes)</td>
</tr>
<tr>
<td>Fresh frozen plasma</td>
<td>200 mL</td>
<td>Acute replacement of coagulation factors pending definitive diagnosis of deficit. Warfarin reversal, factor V deficiency.</td>
<td>† Coagulation factors ~8%</td>
<td>4 units (10-15 mL/kg)</td>
<td>30-minute thawing</td>
</tr>
<tr>
<td>Plateletpheresis</td>
<td>250 mL</td>
<td>Thrombocytopenia or altered platelet function</td>
<td>† Platelet count by 30-50,000/μL</td>
<td>1 pheresis unit</td>
<td>ABO typing (30 minutes)</td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td>25 mL</td>
<td>Hypofibrinogenemia</td>
<td>† Fibrinogen ~3% (also includes factor VIII, von Willebrand)</td>
<td>10 units (1 unit/5 kg)</td>
<td>Thawing and pooling (40 minutes)</td>
</tr>
</tbody>
</table>

†Volume may be increased by addition of red cell nutrient solutions.
### Table 1.

<table>
<thead>
<tr>
<th>Component</th>
<th>Unit Volume</th>
<th>Therapeutic Indication</th>
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</tbody>
</table>

### RISK OF TRANSFUSION

<table>
<thead>
<tr>
<th>Complication</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute hemolytic reaction</td>
<td>1:38,000-1:70,000</td>
</tr>
<tr>
<td>Delayed hemolytic reaction</td>
<td>1:5000-1:11,000</td>
</tr>
<tr>
<td>Allergic (urticarial) reaction</td>
<td>1:33-1:100 (1%-3%)</td>
</tr>
<tr>
<td>Febrile, nonhemolytic reaction</td>
<td>RBC 1:17-1:200 (0.5%-6%)</td>
</tr>
<tr>
<td></td>
<td>Platelet 1:3-1:100 (1%-38%)</td>
</tr>
<tr>
<td>TRALI (transfusion related acute lung injury)</td>
<td>1:5000-1:190,000</td>
</tr>
<tr>
<td>Volume overload</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>HCV</td>
<td>1:1,600,000</td>
</tr>
<tr>
<td>HIV</td>
<td>1:1,900,000</td>
</tr>
<tr>
<td>HBV</td>
<td>1:63,000</td>
</tr>
<tr>
<td>HTLV</td>
<td>1:641,000</td>
</tr>
<tr>
<td>Bacterial contamination</td>
<td>RBC 1:1,300,000</td>
</tr>
<tr>
<td></td>
<td>Plateletpheresis 1:2000</td>
</tr>
</tbody>
</table>

### TRANSFUSION REACTIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Common Cause</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>The diagnosis of suspected extravascular (delayed) hemolytic reaction is made by suspecting the possibility, repeating hematocrits for up to 3 weeks post-transfusion, checking bilirubin levels, and submitting new specimens to Transfusion Service to check the direct antiglobulin test (direct Coombs) and to attempt antibody identification.</em></td>
<td></td>
<td>Intravascular hemolysis,</td>
</tr>
</tbody>
</table>
Table 2.

<table>
<thead>
<tr>
<th>Type</th>
<th>Common Cause</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>hemoglobinemia, renal failure, DIC</td>
<td>hemoglobinemia, renal failure, DIC</td>
<td></td>
</tr>
<tr>
<td>Delayed hemolytic †</td>
<td>Sensitization to RBC antigens other than ABO</td>
<td>Extravascular hemolysis, increased bilirubin, ↓Hgb/Hct</td>
</tr>
<tr>
<td>Febrile nonhemolytic</td>
<td>Recipient HLA antibodies, cytokines in blood product</td>
<td>≥2°C increase in temperature within few hours of transfusion, chills, nausea, vomiting</td>
</tr>
<tr>
<td>Transfusion-related acute lung injury (TRALI)</td>
<td>HLA antibodies</td>
<td>Hypertension, dyspnea, pulmonary edema</td>
</tr>
<tr>
<td>Allergic</td>
<td>Antibodies to plasma proteins</td>
<td>Urticaria, flushing, pruritus, fever (rare)</td>
</tr>
<tr>
<td>Anaphylactic</td>
<td>Anti-IgA in IgA-deficient recipient</td>
<td>Hypotension, wheezing, acute respiratory distress syndrome</td>
</tr>
<tr>
<td>Bacterial contamination</td>
<td>Gram-negative or Gram-positive microorganism</td>
<td>Septic shock, hypotension</td>
</tr>
</tbody>
</table>

Note: Incompatible I.V. solutions, overheated blood warmers, and mechanical pressure can cause hemolysis.

Procedure for Suspected Transfusion Reactions

- Stop the transfusion. Keep the line open with normal saline. If the patient has mild allergic reactions only, the physician may continue the transfusion after antihistamines and/or corticosteroids injections (not given through the transfusion line). Report all reactions to Transfusion Service.
- Monitor the patient's vital signs and urine output carefully. Start appropriate fluid and pressor therapy for the rare hemolytic or anaphylactic reactions.
- Check all labels, forms, and patient identification to determine if the patient received the correct blood.
- Refer to the Possible Transfusion Reaction Form obtained from the Nursing Station or Transfusion Service. Call (831) 625-4811 to request a copy of this form. Send the completed, signed form to Transfusion Service immediately.
RED BLOOD CELL TRANSFUSION GUIDELINES

- Hemoglobin ≤8 g/dL or hematocrit ≤24%
- Symptomatic anemia resulting in tachycardia (>100 beats/minute), mental status changes, ECG signs of cardiac ischemia, angina, or shortness of breath with mild exertion.
- Transfusion for a regular predetermined therapeutic program such as aplastic anemia and hemoglobinopathies, radiation/chemotherapy, etc, where a nadir <8 g/dL is anticipated.
- Acute blood loss of 10% to 15% of estimated blood volume with evidence of inadequate oxygen delivery following volume resuscitation.
- Preoperative hemoglobin <9 g/dL or hematocrit <27%.
- Hemoglobin <10 g/dL or hematocrit <30% when autologous units are available.

POLICY FOR PEDIATRIC TRANSFUSION

Red Blood Cells (leukoreduced)

1. <4 months old
   a. Hematocrit <20% / 8 g/dL hemoglobin with low reticulocyte count and symptoms of anemia (tachycardia, tachypnea, or poor feeding)
   b. Hematocrit <30% with one or more of the following:
      - <35% hood O₂
      - On O₂ by nasal cannula
      - On CPAP or intermittent mandatory ventilation with mean airway pressure <6 cm H₂O
      - Significant apnea or bradycardia (apnea of 6 episodes in 12 hours or 2 in 24 hours) requiring bag and mask ventilation while given methylxanthines.
      - Low weight gain (<10 g/day over 4 days, given 100 kcal/kg/day)
   c. Hematocrit <35% with an infant:
      - On >35% hood O₂
      - On CPAP or intermittent mandatory ventilation with mean airway pressure 6-8 cm H₂O

2. >4 months old
   a. Emergency surgical procedure in a patient with significant preoperative anemia
   b. Preoperative anemia when other corrective therapy is not available
   c. Intraoperative blood loss ≥15% total blood volume
   d. Hematocrit <24% / 8 g/dL hemoglobin:
      - in the perioperative period with signs or symptoms of anemia
• while on chemotherapy/radiotherapy
• chronic congenital or acquired anemia
e. Acute blood loss with hypovolemia not responsive to other therapy
f. Hematocrit <40% / 13 g/dL hemoglobin with severe pulmonary disease
g. Sickle cell disease with:
  • cerebrovascular accident
  • acute chest syndrome
  • splenic sequestration
  • recurrent priapism
  • preoperatively when general anesthesia is planned, to reach hemoglobin of 10 g/dL
h. Chronic transfusion program (such as for thalassemia)

Platelets (leukoreduced)

1. Routine use of platelets is not indicated in cases of ITP, autoimmune thrombocytopenia, and TTP.
2. Platelets of 5000-10,000 with failure of platelet production
3. Platelet count <30,000 in a neonate with failure of platelet production
4. Platelet count <50,000 in a stable premature infant with:
   o active bleeding
   o invasive procedure
5. Platelet count <100,000 in a sick premature infant with:
   o active bleeding
   o invasive procedure
6. Normal platelet count with:
   o active bleeding and a qualitative platelet defect
   o unexplained excessive bleeding in a patient undergoing bypass

Frozen Plasma (FP)

1. DIC
2. Replacement therapy if specific concentrate not available
3. Plasma exchange
4. Reversal of Coumadin® in an emergency situation
5. PT/INR or PTT >1.5 times the mean reference range in a nonbleeding patient scheduled for an invasive procedure

Cryoprecipitate

1. Hypo- or dysfibrinogenemia with active bleeding or undergoing a procedure
2. Factor XIII deficiency with active bleeding (if factor XIII not available)
3. Limited directed donor for bleeding episodes in small children with hemophilia A (previously untreated children should receive recombinant factor VIII)
4. Fibrin sealant
5. von Willebrand disease (if DDAVP® and Humate-P® concentrate not available) with:
   o active bleeding
   o invasive procedure