BLOOD AND BLOOD COMPONENTS, ADMINISTRATION of

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Circular of Information (COI) for the use of human blood and blood components. AABB, American Red Cross, America’s Blood Centers, and the Armed Services Blood Program. (Posted with this policy in AHC Administrative and Clinical Policy Manual.)
1. **PURPOSE:**

To provide guidelines for safe and effective administration of blood and blood components.

2. **SCOPE:**

This policy applies to all patient populations except infants less than 1 year of age. This policy applies to all inpatient/hospital facilities and hospital based outpatient departments/clinics (e.g., VLCC, ambulatory surgery clinic) that are owned, in whole or in part, controlled by Aurora Health Care.

Administration of blood and blood products, with the exception of Rh Immune Globulin, is not allowed in any free standing surgery center or ambulatory clinic owned, in whole or in part, controlled by Aurora Health Care. Any blood/blood product related procedure (e.g., platelet rich plasma procedure or mass transfusion) that is not addressed in this document is considered out of scope for this policy.

3. **POLICY STATEMENTS:**

3.1. A physician’s order is required to transfuse blood or blood components.

3.2. The nurse must verify that informed consent has been obtained prior to the administration of blood or a blood component.

3.3. In the event a patient refuses a blood or blood component, the physician will be notified. Informed Refusal will be documented.

3.4. At the patient bedside, identification of the recipient and the blood or blood components, will be performed by 2 health care providers, one of who is a Registered Nurse and/or transfusionist, using at least two unique patient identifiers (Joint Commission, NPSG 01.01.01 and NPSG 01.03.01)

3.5. All patients that are to receive ABO type-specific blood for transfusion will have confirmatory ABO/Rh testing completed prior to the blood unit(s) being released from the Blood Bank. The ABO/Rh confirmatory testing applies to all blood products (RBC, platelets, plasma, and Cryoprecipitate).

3.6. In order to start the infusion of blood/blood components in a timely manner, the nurse should complete all pre-transfusion activities, including vital sign assessment and establishing patent IV access, prior to obtaining the product from the Blood Bank.

3.7. Any unused blood/blood components must be returned to the Blood Bank as close to the release time as possible. The transfusion must be started within 30 minutes after release from the Blood Bank. The transfusion must be started before the date/expiration time of the blood component.

3.8. Once a unit is spiked, the maximum time for infusing any blood component is 4 hours. Notify Transfusion Services if a unit needs to be infused for more than 4 hours due to risk of circulatory overload.

3.9. Red Blood Cells and plasma products may only be stored in a monitored refrigerator or cooler designated by Transfusion Services. Platelets, cryoprecipitate and granulocytes are never put into a refrigerator or cooler.

3.10. The unit tag must stay attached to the blood product throughout the blood administration.

3.11. Normal saline is the only intravenous solution used for priming and administration of blood or blood components.
3.12. Medications MUST NOT be added to the blood/blood components administration set or the intravenous tubing during transfusions.

3.13. At a minimum, per blood transfusion standards, vital signs of temperature, pulse, respirations, and blood pressure should be assessed as follows:
   a) Before initiating the administration of the blood/blood components
   b) After the first 15 minutes.
   c) At the conclusion of the transfusion.
   d) Further vital signs will be done based on patient assessment and nursing judgment.

3.14. At a minimum, per blood transfusion standards:
   a) The nurse will remain with or be in close observation of the patient for the first 15 minutes of the transfusion, or longer based on nurse’s judgment; and
   b) The patient will be evaluated throughout the transfusion.
   c) For outpatient transfusion or when the patient is discharged after a blood transfusion, the nurse will provide written instructions about adverse events.

3.15. All blood components must be transfused through a blood administration set with a 170 to 260 micron filter designed to remove clots and aggregates (AABB Standards for BBTS, 2014). Change the blood administration tubing set after a maximum time of 4 hours OR after a maximum of 2 units have infused whichever comes first.

3.16. Platelets and RBCs should not be infused through the same tubing. Some platelets are not ABO specific and may cause clumping in the tubing.

3.17. Blood/fluid warmers may be used for red blood cell and plasma transfusions with a physician’s order.

4. PROCEDURES

   Appendix 1. Administration of Blood and Blood Components
   Table 1. ABO/Rh Compatibilities for Blood Components
   Appendix 2. Transfusion Reactions
   Table 2. Suspected transfusion reaction signs and symptoms
   Appendix 3. Donor Directed Donations/Autologous
   Appendix 4. Other Blood Component Derivatives
   Appendix 5. Rh Immune Globulin Administration

5. ADDITIONAL INFORMATION

   Appendix 6. Summary of Blood Components Available at Aurora Transfusion Services: Use, Infusion Guide, and Special Considerations
   Appendix 7. Infusion Rate of Components in Nonemergency Settings
   Appendix 8. Products Available from Pharmacy that may be considered part of blood administration
   Appendix 9. Rh Immune Globulin
   Appendix 10. Reaction, Signs and Symptoms, and Precautions/Nursing Actions: Acute and Delayed

Cross References: Informed Consent/Informed Refusal Policy #2028
Patient Identification Policy #2003
Use of Fluid/Blood Warmer Policy #2024

Owner: Clinical Policy Coordinator
References:


Circular of Information (COI) for the use of human blood and blood components. (December 2013) AABB, American Red Cross, America’s Blood Centers, and the Armed Services Blood Program.


Bibliography


Review Dates: 07/2012; 10/2012, 03/2013, 04/2014
Appendix 1. Administration of Blood and Blood Components

Standard Equipment Needed for a Blood Transfusion:

1. 0.9% normal saline IV bag
2. Y-type Blood administration set with a 170 to 260 micron size filter
3. Blood product compatible infusion pump
4. Antiseptic wipes
5. Gloves
6. Tape
7. Vital sign equipment: Blood Pressure Cuff, Thermometer, Stethoscope
8. Physician order and informed consent
9. Blood Warmer (if ordered)
10. Rapid infusion pump (if ordered)

PROCEDURE: ADMINISTRATION OF BLOOD/COMPONENTS

A. PRIOR TO REQUESTING BLOOD/BLOOD COMPONENT FOR ADMINISTRATION:

<table>
<thead>
<tr>
<th>IMPORTANT STEPS</th>
<th>KEY POINTS-INFORMATION- PRECAUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check physician’s order for date, amount, and type of component to be given and if any special transfusion requirements (e.g. Irradiated, CMV Negative).</td>
<td>a. Order must state: “Give,” “Transfuse,” or “Administer.”</td>
</tr>
<tr>
<td>2. When ABO/Rh type specific blood is ordered, the blood type must be confirmed by the lab using two samples drawn at two different times to confirm the ABO/Rh type prior to issuing the blood product.</td>
<td>b. Check order for any medications to be given before, after a transfusion, or between transfusions. Notify Transfusion Services if a unit needs to be infused for more than 4 hours due to risk of circulatory overload. Older patients and pediatric patients are at greater risk for circulatory overload. In these circumstances, a divided product, one that is split into 2 smaller infusion aliquots may be prepared for the patient.</td>
</tr>
<tr>
<td>3. If the patient refuses to have the second confirmatory sample drawn, notify Transfusion Services immediately.</td>
<td>c. Be familiar with why the patient needs to have a transfusion.</td>
</tr>
<tr>
<td>4. If the patient requires a second ABO/Rh confirmatory test, Transfusion Services will notify the nurse that a second sample is required.</td>
<td>d. If the patient requires a second ABO/Rh confirmatory test, Transfusion Services will notify the nurse that a second sample is required.</td>
</tr>
<tr>
<td>1. If the patient is a line draw, Transfusion Services/Blood Bank will send the 4mL Pink top blood collection tube and specimen label to the nursing unit/department/clinic. Otherwise, the patient may have the second sample drawn by a phlebotomist.</td>
<td>1. If the patient is a line draw, Transfusion Services/Blood Bank will send the 4mL Pink top blood collection tube and specimen label to the nursing unit/department/clinic. Otherwise, the patient may have the second sample drawn by a phlebotomist.</td>
</tr>
<tr>
<td>2. The line draw blood sample needs to be collected within 2 hours of receiving the blood collection tube and label and returned to Transfusion Services/Blood Bank.</td>
<td>2. The line draw blood sample needs to be collected within 2 hours of receiving the blood collection tube and label and returned to Transfusion Services/Blood Bank.</td>
</tr>
<tr>
<td>3. If the first and second samples do not match, a third sample will be requested to confirm the blood type. Transfusion Services is responsible for confirming the results of the second sample and issuing the appropriate ABO/Rh RBCs and other blood products for the patient.</td>
<td>3. If the first and second samples do not match, a third sample will be requested to confirm the blood type. Transfusion Services is responsible for confirming the results of the second sample and issuing the appropriate ABO/Rh RBCs and other blood products for the patient.</td>
</tr>
<tr>
<td>e. Type O blood products may be issued until the second confirmatory test is completed.</td>
<td>e. Type O blood products may be issued until the second confirmatory test is completed.</td>
</tr>
</tbody>
</table>
4. Verify informed consent is documented. The attending physician should address the individual fears and concerns regarding transfusions during the informed consent process. Once consent has been documented, it is valid for the duration of the hospitalization or treatment course.

5. Verify presence of patent IV access.

6. Set up blood administration tubing using normal saline (0.9% sodium chloride) for priming.

   NOTE: All cellular blood components from the Blood Bank are leukocyte-reduced. Special leukocyte reducing blood filters are not needed.

   a. If a patient refuses blood or a blood component, an informed refusal will be documented including the specific products being refused (e.g., progress note, consent, or Form AHC S32495).

   b. Assure that the patient’s cultural and religious beliefs have been considered and the patient has been educated about use of blood products. The Ethics Committee may be consulted for additional information/concerns related to blood transfusions.

   A large gauge needle is preferred; an 18 to 20-gauge needle is recommended (AABB Technical Manual, 2008; AABB Primer of Blood Administration, 2009). Central lines are acceptable.

   Special populations:
   1. Pediatrics, use 22-to-24 gauge catheter
   2. Older adults, or those with fragile veins and skin, use 22 to 24 gauge catheter
   3. When a smaller catheter is used, infuse blood components slowly (2-3 hours) to reduce hemolysis of cells

   If it is necessary to initiate venous access, do so before obtaining the blood/blood product from the Transfusion Services.

   a. Blood shall not be piggybacked into an administration set containing other IV fluid types except 0.9% sodium chloride. (Fluids other than 0.9% sodium chloride can lead to hemolysis or clumping of the component)

   b. Filter for all blood/blood components must be 170 to 260 micron size.

   c. Change blood filter tubing set after a maximum time of 4 hours from spiking the bag to completion of the transfusion OR after a maximum of 2 units has infused whichever comes first.

   d. Use different blood administration set for each blood product type to prevent clumping in tubing.

6. Process for priming blood tubing:

   a. Open administration tubing set and close all clamps

   b. Spike 0.9% normal saline IV bag

   c. Open clamp on tubing attached to saline bag

   d. Squeeze drip chamber allowing saline to cover the filter

   e. Open clamp on common tubing

   f. Close the lower clamp (the clamp on the common tubing) after the tubing is filled

   g. Maintain the protective sterile cap on the tubing until it is attached to the patient’s IV catheter

   Prevents accidental spillage of saline solution

   Review manufacturers directions on blood tubing package

   Only 0.9% normal saline is used to prime blood administration tubing sets
7. Wearing gloves, attach the saline primed tubing to the patient’s IV catheter. Begin infusing normal saline.

8. Infusion pumps are recommended for infusion of blood products.

9. Obtain baseline vital signs, TPR and BP, just prior to obtaining blood product.

10. Pre-medicate if ordered by physician
   a. Give pre-medications 30 to 60 minutes before blood is started or as ordered by physician.

   **B. OBTAINING BLOOD COMPONENT**

1. The nurse will print and complete the release of blood requisition. Blood products may be picked up by any Aurora employee or delivered via pneumatic tube system from Transfusion Services if approved at that hospital site.

   **NOTE:** For those hospitals or nursing areas where blood is delivered via pneumatic tube system, follow site-specific procedures.

2. Observe blood for abnormal color, clumping, gas bubbles, or extraneous material

   **NOTE:** Albumin products are ordered from Pharmacy
   Report abnormal findings to Transfusion Services and return the unit.

   **Disinfect port prior to attaching tubing.**
   Saline tubing should be in port closest to patient.
   **Read Nursing Care During Administration (next section) before starting blood infusion.**
   **Caution: Not all infusion pumps are approved for use with platelet products. Consult site Clinical Engineering staff, Transfusion Services or infusion pump manual. Verify before using the infusion pump.**
   Use an infusion pump for patients 80 years of age or older who need to receive volume greater than 100 mL and for pediatric patients.

   **Vital signs MUST be taken before obtaining blood from Transfusion Services.**
   If temperature is 38.0°C or 100°F or greater, notify the physician before requesting blood component from the Transfusion Services. This is not a contraindication to the transfusion, but may make assessment and decisions regarding blood reactions difficult (Simmons, 2003).

   **Febrile reaction may be prevented by giving acetaminophen. Allergic reactions may be prevented by giving antihistamines or steroids. (AABB Primer for Blood Administration, 2009)**
Prior to spiking the infusion bag, the blood/blood component should be gently mixed. This action helps to suspend the cells and to prevent clumps from forming.

If there will be any delay in starting the infusion, the blood product must be promptly returned to Transfusion Services. Transfusion Services may issue red cells or plasma in an approved portable cooler. DO NOT remove red cells or plasma from cooler until ready to transfuse.

Any unused blood product returned to Transfusion Services that exceeds the temperature storage requirements will be discarded. Platelets, granulocytes, and cryoprecipitate must NEVER be placed in a cooler.

3. Complete the patient identification process using 2 required patient identifiers.

Verify that patient identifiers are identical on the hospital armband and blood product unit tag by following the read back process.

- Unit number;
- Unit ABO and Rh type;
- Type of blood component;
- Modified blood components/special product requirements
- Expiration Date and time
- Donor and recipient ABO and Rh type
- Interpretation of the crossmatch tests (only if RBCs or granulocytes)

Identification of the recipient and the blood or blood components, will be performed by 2 caregivers that are trained and competent, one of whom is a Registered Nurse. The transfusionist must always be one of the two caregivers verifying the patient's identification. Patient identification must be done in the patient's presence using two patient identifiers.

The first (1st) health care provider must read the information on the unit tag (Transfusion Administration Record) to the second caregiver to compare with the patient's armband. The second (2nd) health care provider must verbally read back the patient's name and MRU/MRN number from the patient's hospital armband for confirmation by the first caregiver. The information MUST be identical in order to proceed with the transfusion.

Note: Depending upon blood product availability, the donor ABO and/or Rh may not be identical to the patient. (See Table 1: ABO/Rh Compatibility Chart)

Consult the Transfusion Services for any questions regarding ABO or Rh compatibility between the donor's product and recipient. Crossmatch information will be listed on the unit tag attached to the unit.

Modified blood components/special product requirements will have special labeling that may include irradiated, CMV negative, HLA-matched, or autologous units, etc.

The caregivers will barcode scan the blood unit number and the blood product code into the EHR. Staff will document blood unit verification in the EHR. A second screen will pop-up requesting the information from the second blood unit verifier.

NOTE: If the administration record is attached to the unit along with the unit tag, the top 2 copies may be removed for documentation purposes. The back copy (unit tag) MUST remain attached to the product for the entire transfusion and is disposed along with the empty bag post transfusion.
Table 1. ABO/Rh Compatibilities for Blood Components (not whole blood); for information only – Transfusion Services is ultimately responsible for providing compatible blood products

ABO/Rh Compatibility Chart

<table>
<thead>
<tr>
<th>Recipient Type</th>
<th>Donor Type Red Blood Cell</th>
<th>Donor Type Plasma</th>
<th>Donor Type Platelets</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A or O</td>
<td>A or AB</td>
<td>A, AB, B, O</td>
</tr>
<tr>
<td>B</td>
<td>B or O</td>
<td>B or AB</td>
<td>B, AB, A, O</td>
</tr>
<tr>
<td>AB</td>
<td>AB, A, B, O</td>
<td>AB</td>
<td>AB, A, B, O</td>
</tr>
<tr>
<td>O</td>
<td>O</td>
<td>O, A, B, AB</td>
<td>O, A, B, AB</td>
</tr>
<tr>
<td>Rh positive</td>
<td>Rh positive</td>
<td>Rh positive/negative</td>
<td>Rh positive/negative</td>
</tr>
<tr>
<td>Rh negative</td>
<td>Rh negative</td>
<td>Rh negative/positive</td>
<td>Rh negative*</td>
</tr>
</tbody>
</table>

* Rh positive platelets are an acceptable alternative
D. NURSING CARE DURING BLOOD ADMINISTRATION:

<table>
<thead>
<tr>
<th>IMPORTANT STEPS</th>
<th>KEY POINTS – INFORMATION - PRECAUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Educate patient related to transfusion signs and symptoms.</td>
<td>Partner with your patient regarding educational needs when receiving a blood transfusion.</td>
</tr>
<tr>
<td>a. Educating the patient to tell caregivers of a change in how they feel is most important.</td>
<td>Provide patient with appropriate educational materials for reference.</td>
</tr>
<tr>
<td>2. Assess patient for any current symptoms that later may be mistaken for a transfusion reaction: chills, rash, muscle ache, breathing difficulty.</td>
<td>Plan for patient care while the transfusion is in process. Avoid transporting or moving the patient, especially within the first 15 minutes of beginning a transfusion. If transport is necessary, nursing assessment and judgment is used to determine whether an RN will accompany the patient, or if other personnel may be used.</td>
</tr>
<tr>
<td>3. Beginning the transfusion:</td>
<td></td>
</tr>
<tr>
<td>a. Use appropriate personal protective equipment (PPE) for blood borne pathogens when handling any blood products</td>
<td></td>
</tr>
<tr>
<td>b. The blood product is gently mixed</td>
<td></td>
</tr>
<tr>
<td>c. The protective cover is removed from the access port of blood component bag and spiked with remaining IV tubing Y connection</td>
<td></td>
</tr>
<tr>
<td>d. Close the 0.9% NS clamp above the filter and open the clamp to the blood unit. Prime the IV tubing with blood. Blood will flow into the drip chamber. Tap the filter chamber to remove any residual air</td>
<td></td>
</tr>
<tr>
<td>e. Initiate the infusion by opening the common tubing clamp and regulating the blood infusion</td>
<td></td>
</tr>
<tr>
<td>4. Start blood infusion</td>
<td>Staying with the patient or being in close observation is critical to detect a reaction and be able to respond immediately.</td>
</tr>
<tr>
<td>a. The nurse will remain with or be in close observation of the patient for the first 15 minutes of the transfusion, or longer based on nurse’s judgment (AABB Standards for BBTS, 2014).</td>
<td>Baseline VS and VS after 15 minutes provide data for assessment and identification of any significant change. Additional VS after 30 or 60 minutes would be warranted if patient is symptomatic.</td>
</tr>
<tr>
<td>b. Infuse blood at 100 mL per hour <strong>for the first 15 minutes</strong>. Verify provider orders for any specified infusion rate.</td>
<td>Severe reactions generally occur within the first 15 minutes. Signs of a severe reaction include sudden onset of fever with or without chills, tachycardia, tachypnea, respiratory distress, skin rash/hives, hypotension and cardiac arrest. The infusion may need to be slower as dictated by the patient condition or physician order. In emergent situations, blood can be infused as rapidly as the patient will tolerate and the type of access will allow.</td>
</tr>
<tr>
<td>c. If no reactions occur, then the rate may be increased to infuse blood over 1-2 hours (AABB Technical Manual, 2008). Generally red blood cells are infused over 2 hours; no longer than 4 hours</td>
<td></td>
</tr>
</tbody>
</table>

See Appendix 7, page 22 for Suggested Infusion Rate of Components in Nonemergency Settings for Adult and Pediatric patients.
5. Evaluate the patient throughout the transfusion for his/her condition and adverse reactions; frequency of evaluation is dictated by patient’s status. Monitor and intervene for transfusion reactions (Bryan 2002).
6. Objective signs may include: fever, chills/rigor, hypotension, tachycardia, shortness of breath/dyspnea, dark or tea colored urine, and bleeding/generalized oozing.
7. Subjective signs may include: feeling of restlessness, anxiety, reports of vague, uneasy feelings, reports of pain in abdomen, chest or back, headache, nausea and vomiting, and increased pain at IV site.
8. If patient has an adverse reaction to the blood or blood component, stop the transfusion and contact the ordering physician. Notify Transfusion Services if the patient has a suspected reaction and document assessment findings on the appropriate form/flowsheet.

9. If blood/blood components are administered for longer than 2 hours, agitate the unit of blood gently several times during the transfusion

Turn the bag over 2 or 3 times as gentle agitation to keep the cells in suspension. This is not necessary when blood is given over 1-2 hours

10. Blood/Blood components should not hang more than 4 hours. At the end of 4 hours, if any blood/blood component remains, contact Transfusion Services for further directions.

Users will document the completion of a blood transfusion in the EHR.

11. The end time is recorded as the time the blood is clamped and the clamp for the NS IV bag is opened.

The final rate of the infusion is then entered as zero (0) on the Blood Administration Doc flowsheet.

12. Documentation of the blood transfusion will follow the information presented in the “Blood Transfusion Documentation Tip Sheet.”

Diluted blood product may be visible in the IV tubing after flushing with 0.9% normal saline.

13. Don gloves and other appropriate protective equipment when the infusion is complete. Flush the IV tubing with 0.9% normal saline. Maintain IV patency by infusing 0.9% NS at TKO rate while determining the next steps

Saline bag can be disposed into regular trash.

14. Dispose of empty blood bags and filter tubing in red biohazard bag.

Change blood tubing after a maximum of 4 hours OR after a maximum of 2 units whichever comes first.

15. If physician order states a 2nd unit is to be transfused follow same steps listed above for administration:

Perform and document assessment for 2nd unit appropriately. Specific written instructions concerning possible adverse events must be given to patients who will be discharged after the transfusion.

16. Patient education post-transfusion:
   a. Patient will receive a handout on blood transfusion and possible adverse events (e.g., Krames or FYWB ).
   b. Review critical components of education, e.g., delayed transfusion reaction, signs/symptoms of infection at IV site, etc.
   c. Document education provided.
17. Documentation Summary:
   a. Document transfusion data on the appropriate nursing form/flowsheet including:
      • blood component type
      • unit ID number of component
      • start time
      • end time
      • volume infused
      • initials
      • blood/fluid warmer (if used during administration)
   b. Record the volume of blood/component and normal saline infused on the Intake and Output Record.
      Volume of RBC product is approximately 350ml. Volume of other products is printed on Transfusion Administration Record attached to the blood bag
   c. Document vital signs in the EHR or on the appropriate nursing documentation form/flowsheet. Document on the Transfusion Administration Record where the vital signs can be found. Complete the information needed on the Transfusion Administration Record
   d. Place Part I of the Transfusion Administration Record–chart copy – in the patient’s chart under Laboratory Report
      or
      Document into the appropriate section of the EHR.
   e. Return Part II (yellow copy) of the Transfusion Administration Record to the Transfusion Services
      or
      Follow site-specific procedures.
Appendix 2. TRANSFUSION REACTIONS  
(AABB Technical Manual, 2008; AABB Primer of Blood Administration, 2009)

1. General Information:
   a) Transfusion reaction: any unfavorable event occurring in a patient during or after a transfusion of blood or blood components that can be related to that transfusion
   b) A transfusion reaction may be acute (occurs within minutes or hours of blood or blood component administration) or delayed (occurs within days or years of blood or blood component administration)
   c) **Essential interventions are universal:**
      - Stop transfusion
      - Keep IV access open
      - Assess patient including vital signs and pulse oximetry
      - Notify physician
      - Notify Transfusion Services

2. Suspected Transfusion Reaction:

   **Table 2: Suspected transfusion reaction signs and symptoms** (Bryan, 2002)

<table>
<thead>
<tr>
<th>Objective signs</th>
<th>Subjective symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever: Temperature increase of 1°C or 2°F</td>
<td>Restlessness</td>
</tr>
<tr>
<td>Chills, rigor</td>
<td>Anxiety, feeling of impending doom</td>
</tr>
<tr>
<td>Hypotension</td>
<td>Vague, uneasy feeling</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>Pain in abdomen, chest or back</td>
</tr>
<tr>
<td>Shortness of breath, dyspnea</td>
<td>Headache</td>
</tr>
<tr>
<td>Dark or Tea Colored Urine</td>
<td>Nausea, vomiting</td>
</tr>
<tr>
<td>Bleeding, generalized oozing</td>
<td>Pain at IV site</td>
</tr>
</tbody>
</table>

   In the event of a suspected transfusion reaction, the following actions should be taken:

   **IMPORTANT STEPS**

   1. Stop the transfusion immediately
   2. While wearing gloves, disconnect the blood component and blood administration set – put a sterile cap on the tubing and save for possible restart of infusion
   3. Attach a new bag of 0.9% normal saline with a new administration set. Infuse normal saline at “keep open” rate
   4. Notify the physician of the patient’s symptoms and vital signs
   5. Treat the patient’s symptoms as prescribed by the physician and monitor vital signs as ordered, or every 15 minutes until acute symptoms resolve. The physician may order the transfusion restarted after treating the patient’s symptoms.

   **KEY POINTS – INFORMATION - PRECAUTIONS**

   To limit the amount of blood infused
   To prevent the patient from receiving any more blood or blood component. Do NOT throw the blood bag and tubing away; keep in room for examination.
   To keep the IV line open. If physician does not specify a rate, use 10 mL per hour as keep open rate.
   The physician will determine the need for the transfusion reaction evaluation.
   Do not resume transfusion unless ordered by physician.
6. Notify the Transfusion Services of any suspected transfusion reaction regardless if the physician orders a transfusion reaction investigation.

7. Initiate the **Suspected Transfusion Reaction Report:**
   
   a. Perform bedside verification of all labels, forms and patient identification on the blood component and patient.

   b. If ordered, draw blood samples and send to Lab as soon as possible. A urine sample may be requested but is typically not required as part of the initial evaluation.

   c. Send the completed Transfusion Reaction Report to the Transfusion Services and return:
      - Unused portion of the blood component or empty bag
      - The blood administration set tubing and IV solutions
      - All related forms and labels

8. Document the time of reaction, signs and symptoms, physician notification, and all interventions taken as well as patient response and current condition.
Appendix 3. DIRECTED DONOR and PRE-SURGICAL AUTOLOGOUS DONATIONS

General Information:

Due to concerns regarding transfusions, a patient may request that s/he receive blood donated by family members or friends or with blood s/he has donated for themselves prior to their elective surgery.

<table>
<thead>
<tr>
<th>IMPORTANT STEPS</th>
<th>KEY POINTS - INFORMATION - PRECAUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. For information about Directed Donations or Pre-surgical Autologous Donations, a physician, nurse, or other staff member should contact the local Blood Center of Wisconsin to request information and obtain the correct order form.</td>
<td>A physician order is required for directed or pre-surgical autologous donations. Blood Product Forms At the Blood Product forms screen, select Therapeutic Services Forms. Look for forms to order autologous and directed blood donations.</td>
</tr>
<tr>
<td>Pre-surgical autologous donations must be made at least 8 days prior to the scheduled surgery, and preferably 14 days or more to avoid preoperative anemia. These donations are for elective procedures only.</td>
<td></td>
</tr>
<tr>
<td>2. For Directed Donations, determination of the patient’s ABO and Rh type should be performed unless there is already documentation of the testing (completed by the hospital)</td>
<td></td>
</tr>
<tr>
<td>3. Using appropriate order form from Blood Center of Wisconsin, provide the following information:</td>
<td></td>
</tr>
<tr>
<td>• Patient’s Name</td>
<td></td>
</tr>
<tr>
<td>• Date of Birth</td>
<td></td>
</tr>
<tr>
<td>• ABO &amp; Rh type (not required for Pre-surgical Autologous Donation)</td>
<td></td>
</tr>
<tr>
<td>• Hospital information</td>
<td></td>
</tr>
<tr>
<td>• Ordering physician information</td>
<td></td>
</tr>
<tr>
<td>• Diagnosis/surgery</td>
<td></td>
</tr>
<tr>
<td>• Date of anticipated transfusion</td>
<td></td>
</tr>
<tr>
<td>• Number of units needed and type of blood component (e.g. whole blood, red blood cells, etc.)</td>
<td></td>
</tr>
<tr>
<td>4. For Directed Donations, patient/family should notify potential donors to call the local Blood Center to arrange an appointment a minimum of 72 hours prior to blood being needed.</td>
<td>Directed donors must meet all allogeneic eligibility criteria to complete a donation.</td>
</tr>
<tr>
<td>5. Contact the Transfusion Services to determine the number of donor-directed units or autologous units available for the patient.</td>
<td></td>
</tr>
<tr>
<td>The order for transfusion is:</td>
<td></td>
</tr>
<tr>
<td>• Autologous units</td>
<td></td>
</tr>
<tr>
<td>• Directed donor units</td>
<td></td>
</tr>
<tr>
<td>• Allogeneic units</td>
<td></td>
</tr>
<tr>
<td>6. Autologous units are identified on the tag attached to the unit. Autologous units can only be given to the patient who donated the unit</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPORTANT STEPS</th>
<th>KEY POINTS - INFORMATION - PRECAUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. For information about Directed Donations or Pre-surgical Autologous Donations, a physician, nurse, or other staff member should contact the local Blood Center of Wisconsin to request information and obtain the correct order form.</td>
<td>A physician order is required for directed or pre-surgical autologous donations. Blood Product Forms At the Blood Product forms screen, select Therapeutic Services Forms. Look for forms to order autologous and directed blood donations.</td>
</tr>
<tr>
<td>Pre-surgical autologous donations must be made at least 8 days prior to the scheduled surgery, and preferably 14 days or more to avoid preoperative anemia. These donations are for elective procedures only.</td>
<td></td>
</tr>
<tr>
<td>2. For Directed Donations, determination of the patient’s ABO and Rh type should be performed unless there is already documentation of the testing (completed by the hospital)</td>
<td></td>
</tr>
<tr>
<td>3. Using appropriate order form from Blood Center of Wisconsin, provide the following information:</td>
<td></td>
</tr>
<tr>
<td>• Patient’s Name</td>
<td></td>
</tr>
<tr>
<td>• Date of Birth</td>
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</tr>
<tr>
<td>• ABO &amp; Rh type (not required for Pre-surgical Autologous Donation)</td>
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<tr>
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</tr>
<tr>
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<tr>
<td>• Date of anticipated transfusion</td>
<td></td>
</tr>
<tr>
<td>• Number of units needed and type of blood component (e.g. whole blood, red blood cells, etc.)</td>
<td></td>
</tr>
<tr>
<td>4. For Directed Donations, patient/family should notify potential donors to call the local Blood Center to arrange an appointment a minimum of 72 hours prior to blood being needed.</td>
<td>Directed donors must meet all allogeneic eligibility criteria to complete a donation.</td>
</tr>
<tr>
<td>5. Contact the Transfusion Services to determine the number of donor-directed units or autologous units available for the patient.</td>
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<td>The order for transfusion is:</td>
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</tr>
<tr>
<td>• Directed donor units</td>
<td></td>
</tr>
<tr>
<td>• Allogeneic units</td>
<td></td>
</tr>
<tr>
<td>6. Autologous units are identified on the tag attached to the unit. Autologous units can only be given to the patient who donated the unit</td>
<td></td>
</tr>
</tbody>
</table>
7. Donor directed (blood donors selected by the recipient) are identified on the tag attached to the unit. The patient’s name appears on the tag.

NOTE: If donor directed blood is compatible, it will be made available for the patient. If it is not, it will be released into general blood inventory by Blood Center of Wisconsin. Exceptions may occur. Donor Directed units of blood will not be sent by Blood Center of Wisconsin if:
   a. Infectious disease testing results indicate donated blood is not safe for transfusion. Due to donor confidentiality the reason will not be disclosed.
   b. The blood bag breaks during processing or transportation.
## Appendix 4. OTHER BLOOD COMPONENT DERIVATIVES
SUCH AS ALBUMIN OR FACTOR CONCENTRATES FOR HEMOPHILIA PATIENTS

<table>
<thead>
<tr>
<th>IMPORTANT STEPS</th>
<th>KEY POINTS - INFORMATION - PRECAUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Verify presence of patent IV.</td>
<td>Directions for administration will be provided by Pharmacy</td>
</tr>
<tr>
<td>2. Obtain product from Pharmacy. Follow site-specific procedures for obtaining IV tubing with 15-micron filter.</td>
<td>Patients need to be informed that some pharmaceuticals are derived from human blood (e.g., albumin).</td>
</tr>
<tr>
<td>3. Record albumin volume on Intake &amp; Output if appropriate for patient.</td>
<td></td>
</tr>
<tr>
<td>4. Documentation of the type of product, lot number, and volume must be performed in the Medical Administration Record or IV therapy Profile.</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix 5. Rh IMMUNE GLOBULIN ADMINISTRATION

<table>
<thead>
<tr>
<th>IMPORTANT STEPS</th>
<th>KEY POINTS - INFORMATION - PRECAUTIONS</th>
</tr>
</thead>
</table>
| 1. Verify physician order for Rh Immune Globulin.  
   a. **Inpatient units and hospital-based clinics:**  
      Obtain product from Transfusion Services.  
   b. **Other ambulatory clinic sites:** Follow site-specific procedures to obtain product. | Must be given within 72 hours of Rh-negative maternal patient exposure to Rh-positive fetal cells after delivery, miscarriage, abortion, ectopic pregnancy or prenatal manipulation. Rh Immune Globulin is also given antepartum to Rh-negative maternal patients at or around 28 weeks gestation. |
| 2. Document administration of product and lot number in Immunization Field of EHR or on paper form from Transfusion Services. | |
Appendix 6.

Summary of Blood Components Available at Aurora Transfusion Services: Use, Infusion Guide, and Special Considerations

NOTE: When blood is refused, a Refusal Form must be completed.

<table>
<thead>
<tr>
<th>Blood Component</th>
<th>Modifications</th>
<th>Volume</th>
<th>Action and Use</th>
<th>Infusion Guide (See Appendix 7 for Infusion Rates)</th>
<th>Special Considerations</th>
</tr>
</thead>
</table>
| RBCs, Leukoreduced | CMV Negative; Irradiated (prevent GVHD in immunocompromised patients) | 350 mL | Improved oxygen-carrying capacity in patient | - Transfuse in ≤ 4 hours  
- Use 170-260 micron Y-type administration set  
- Prime with 0.9% sodium chloride | - ABO and Rh compatible;  
- 1 unit raises the hemoglobin by approx. 1 gm/dL (Hct by 3%) if there is no active blood loss |
| Apheresis Platelets, Leukoreduced (AKA Single Donor Platelet) | CMV Negative; Irradiated (to prevent GVHD in immunocompromised patients)  
HLA matched (for patients who are refractory to platelet transfusion and have HLA antibodies) | Volume (See Transfusion Record)  
Equivalent to 6-8 random, pooled units | Control or prevent bleeding associated with platelet deficiencies or platelet dysfunction. Usual adult dose with bleeding: 1 apheresis unit | - Use 170-260 micron Y-type administration set  
- May use infusion pump if indicated by manufacturer | - 1 unit should raise platelet count of 70-kg adult by 30,000-60,000/mL;  
- Determination of ABO/Rh type may be required. |
| Plasma Products | Thawed Plasma expires 5 days after thawing | Volume (See Transfusion Record) | Replacement of clotting factors in patients with a documented elevated INR/PT/PTT and bleeding; Replacement fluid for patients with TTP | - Use 170-260 micron Y-type administration set  
-May use infusion pump | - Dose: 10 to 15 mL/kg of body weight  
- Determination of ABO/Rh type may be required.  
- Does not contain platelets  
- Thawed Plasma requires 30-45 minutes to thaw  
- 1 unit raises clotting factors 2-3%  
- Must be ABO compatible |
<table>
<thead>
<tr>
<th>Blood Component</th>
<th>Modifications</th>
<th>Volume</th>
<th>Action and Use</th>
<th>Infusion Guide (See Appendix 7)</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granulocytes</td>
<td>Prepared by apheresis</td>
<td>200 to 300 mL</td>
<td>Used to treat patients with significant neutropenia (&lt;500/uL neutrophils) and documented infection unresponsive to antibiotics.</td>
<td>- Usually administered one product daily for 4 to 5 consecutive days - Administer slowly over 2 to 4 hours - DO NOT USE a leukocyte reduction filter - Avoid use of infusion pump for administering product</td>
<td>- Must be ABO/Rh compatible and crossmatched similar to RBCs - Check vital signs every 15 minutes - Febrile reactions occur in about two thirds of patients - Watch for chills, fever, and allergic reactions - Requires pre-medication prior to start of infusion</td>
</tr>
<tr>
<td>Cryoprecipitate antihemophilic factor (AHF), single or pooled (routinely supplied in a pool of 5 donor units)</td>
<td>Usual order in adult is for 10 units. Transfusion Services will typically issue as a pool of 5 donor units. Each unit contains factor VIII, vWF, factor XIII, fibrinogen; Each pool of 5 donor units is approx. 100-150 mL</td>
<td>-Used to replace fibrinogen in patients with DIC or massive transfusion (dilutional coagulopathy) -Use 170-260 micron filter Y-type administration set -Administer as fast as tolerated (10mL/min)</td>
<td>- Rh matching not required. - Determination of ABO/Rh type may be required. - Infuse within 4 hours of thawing - Saline may be added to bag to facilitate recovery of component - Frequent repeat doses may be necessary.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appendix 7. Infusion Rate of Components in Nonemergency Settings
(AABB Technical Manual, 2009)

**NOTE:** Flow rate is adjusted based on the volume the patient’s circulatory system can tolerate.

<table>
<thead>
<tr>
<th>Component</th>
<th>Suggested Infusion Rate**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adult</td>
</tr>
<tr>
<td>Red Blood Cells</td>
<td>150 to 300 mL/hr</td>
</tr>
<tr>
<td>Platelets</td>
<td>200 to 300 mL/hr</td>
</tr>
<tr>
<td>Fresh Frozen Plasma</td>
<td>200 to 300 mL/hr</td>
</tr>
<tr>
<td>Granulocytes</td>
<td>75 to 100 mL/hr</td>
</tr>
<tr>
<td>Cryoprecipitated Antihemophilic Factor (AHF)</td>
<td>As rapidly as tolerated</td>
</tr>
</tbody>
</table>

**Flow rate is adjusted so transfusion can be completed in less than 4 hours. If a patient is unable to tolerate the volume of components, notify Transfusion Services.
### Appendix 8.
**Products Available from Pharmacy that may be considered part of blood administration**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Action and Use</th>
<th>Infusion Guide</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>5% solution in concentration of 250 mL or 500 mL; 25% solution in 50 to 100 mL concentration</td>
<td>Plasma volume expander; for hypovolemic shock Supports blood pressure during hypotensive episodes; induces diuresis in fluid overload</td>
<td>May be administered as rapidly as tolerated for reduced blood volume Normal rates: 2 to 4 mL/min for 5% solution; 1 mL/min for 25% solution Supplied in glass bottles (obtain appropriate tubing to infuse via pump or gravity).</td>
<td>25% albumin is hypertonic and is five times more concentrated than 5% solutions Observe for potential circulatory overload No ABO/Rh typing necessary</td>
</tr>
<tr>
<td>Plasma protein fraction (e.g., Plasmanate, Plasma-Plex, etc.)</td>
<td>Glass bottle with tubing 250 mL</td>
<td>Same as albumin</td>
<td>Equivalent to 5% albumin</td>
<td>Has fewer purification steps than albumin; -No ABO/Rh typing necessary -Sodium content of Plasmanate (brand) is 145 mEq/L and is similar to Albumin 5% (130 to 160 mEq/L). <strong>NOTE: PLASMANATE is not the same as PLASMA Products. Verify with ordering physician if the product to be requested is not clear.</strong></td>
</tr>
<tr>
<td>Intravenous Immunoglobulin (IVIG)</td>
<td>See Medication Administration information from Pharmacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma Derivatives and Recombinant Factor Concentrates (e.g. Factor rVIIa, Humate P, Helizate, Benefix, Antithrombin III)</td>
<td>Replacement factor for specific factor deficiency</td>
<td>Infuse via syringe over 5 to 10 minutes or per pharmacy (and/or manufacturer’s) instructions.</td>
<td>Order from Pharmacy Concentrate provided with sterile diluent and reconstituted by Pharmacy.</td>
<td></td>
</tr>
</tbody>
</table>

*Adapted from: AABB. (2009). Primer of Blood Administration. Bethesda, MD.*
### Appendix 9. Rh Immune Globulin

<table>
<thead>
<tr>
<th>Component</th>
<th>Reason for Use</th>
<th>Standard Dose</th>
<th>Nursing Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rh Immune Globulin (e.g. Rhophylac®)</td>
<td>Blocks maternal production of antibodies against Rh-positive fetal cells in Rh-negative maternal patients. Consider if Rh negative patient of child bearing age receives transfusion with Rh positive blood products.</td>
<td>Standard dose: 300 micrograms or 1500 IU given IM. NOTE: Microdose (50 micrograms) NOT available at AHC. NOTE: Rhophylac product may be given IM or IV.</td>
<td>Must be given within 72 hours of Rh-negative maternal patient exposure to Rh-positive fetal cells after delivery, miscarriage, abortion, ectopic pregnancy or prenatal manipulation. Rh Immune Globulin Workup (RHW) must be ordered to confirm patient’s Rh (D) type and determine number of vials required. Inpatient or Hospital Based Clinic—Obtain product from Transfusion Services All other sites—Follow site-specific procedures. Contraindicated in patients with anaphylactic or severe systemic reaction to human globulin. Use with extreme caution when administering drug to patients with IgA deficiency due to risk of patient developing IgA antibodies and having an anaphylactic reaction. (Note: Rhophylac may have less IgA content than other Rh Immune Globulin preparations).</td>
</tr>
</tbody>
</table>

### Appendix 10.

**Reaction, Signs and Symptoms, and Precautions/Nursing Actions: Acute and Delayed**

*(Adapted from NHSN Biobvigilance, 2011)*

<table>
<thead>
<tr>
<th>Reaction Type</th>
<th>Signs/Symptoms</th>
<th>Nursing Actions/Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACUTE REACTIONS:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Febrile, Non-Hemolytic (FNHTR):**  
Caused by a reaction to antibodies directed against leukocytes or platelets, plasma protein antibodies, or inflammatory cytokine release.  | • Increase in temperature by 2° F or 1° C from baseline during or within 4 hours of transfusion  
• May or may not be accompanied by chills | • Stop infusion immediately, report to physician for evaluation.  
• Do NOT restart unit  
• Typically treated with Acetaminophen  
• For severe rigors, meperidine may be indicated  
• Report to Transfusion Services even if physician desires no transfusion reaction work-up to be performed  
• If Transfusion Reaction Workup ordered follow instructions per Transfusion Services staff |
| **Allergic/Anaphylactic:**  
Often the result of an antigen-antibody reaction to a suspected allergen in the plasma portion of the blood product. Most often occur with plasma and platelet products. | Mild Allergic Reaction:  
• Rash  
• Pruritis  
• Urticaria(Hives)  
Anaphylactic-type Reaction:  
• Angioedema  
• Swelling of lips, tongue and/or uvula  
• Periorbital edema  
• Wheezing  
• Respiratory distress  
• Hypotension  | • Antihistamines and corticosteroids may be given for prophylaxis to individuals with a history of allergic reactions as ordered by physician  
• Stop transfusion and report to physician for evaluation  
• Report to Transfusion Services even if physician desires no transfusion reaction work-up to be performed  
• Often treated with antihistamines when symptoms develop  
• **NOTE:** *With mild reactions, it may be possible to restart transfusion after administration of antihistamine and relief of itching/hives and no respiratory symptoms are present*  
• **NEVER** restart a transfusion if wheezing or respiratory distress is present  
• Call STAT/Rapid Response team if severe respiratory distress  
• If Transfusion Reaction Workup ordered, follow instructions per Transfusion Services staff |
| **Acute Hemolytic Transfusion Reaction (AHTR):**  
Clinical signs/symptoms of increased destruction of transfused RBCs; hemolysis can be intravascular or extravascular; occurs within 24 hours of transfusion. Most often due to the recipient’s plasma being incompatible with the donor’s red cells (e.g. ABO mistransfusion). Misidentification of the blood sample, blood unit or patient, and the improper labeling of the blood sample or blood are the two errors that most often lead to this reaction.  | • Chills/rigors  
• Fever  
• Back/flank pain  
• Red or very dark urine (hemoglobinuria)  
• Pain at IV site  
May progress to signs of shock or renal failure:  
• Oliguria/anuria  
• Unexpected bleeding  
• Renal failure  
• Disseminated intravascular coagulation (DIC)  
• Shock  | • STOP transfusion immediately  
• Clerical check of blood product bag tag and patient hospital ID band  
• Notify physician and Transfusion Services  
• Maintain patent IV with normal saline  
• Monitor patient I&O, vital signs  
• Do NOT restart transfusion  
• Observe for signs of hemorrhage resulting from DIC  
• Support medical therapies to reverse shock  
• For Transfusion Reaction Workup obtain blood sample and/or urine sample as directed by Transfusion Services  
• Save blood bag and tubing and return to Transfusion Services |
<table>
<thead>
<tr>
<th>Reaction Type</th>
<th>Signs/Symptoms</th>
<th>Nursing Actions/Recommendations</th>
</tr>
</thead>
</table>
| Transfusion-Associated Circulatory Overload (TACO): | • New onset of hypoxemia  
• Dyspnea, tachypnea  
• Elevated CVP readings  
• Distended neck veins  
• Increased secretions from ET tube (pink, frothy)  
• Orthopnea  
• BNP result may assist in differentiating between TACO and TRALI  
• CXR shows evidence of pulmonary edema, increased cardiac silhouette | • For patients with cardiac dysfunction or age 80 years or older, the risk of TACO is increased.  
• Lung auscultation at initiation of transfusion is recommended for patients at increased risk with further assessment as indicated.  
• Consider stopping or decreasing rate of other IV fluids if patient has a history of pulmonary edema or fluid overload  
• Transfuse each unit over maximum of 4 hours  
• Diuretics may be ordered before or between transfusions  
• Place patient in semi-Fowler or upright or sitting position to increase venous resistance  
• If signs of overload, stop transfusion immediately  
• Notify physician and Transfusion Services  
• Follow physician orders |
| Can be seen with all types of blood products      | |                                                                                                                                                           |
| Transfusion – Related Acute Lung Injury (TRALI):  | • Acute onset of dyspnea  
• Hypoxemia (O2 saturation < 90% on room air)  
• Hypotension  
• Normal pulmonary capillary wedge pressure (no evidence of circulatory overload)  
• Bilateral infiltrates on chest x-ray | • No known prevention exists  
• Notify physician for any respiratory distress associated with transfusion  
• Notify STAT/Rapid Response team  
• If TRALI suspected, notify Transfusion Services for needed investigation  
• Expect STAT chest-X-ray |
| - Reaction may be caused by donor white cell antibodies or biologically active lipids present in the blood product; activation of the recipient’s primed white blood cells occurs releasing vasoactive substances and results in increased pulmonary capillary permeability; can lead to noncardiogenic pulmonary edema. By definition seen during or within 6 hours of transfusion. | |                                                                                                                                                           |
| Bacterial Contamination/ Bacterial Sepsis:        | • High fever  
• Chills/rigors  
• Hypotension  
• Shock | • Stop transfusion immediately  
• Notify physician and Transfusion Services  
• Maintain patent IV with normal saline  
• Assess patient and monitor vital signs  
• SAVE blood bag and tubing and return to Transfusion Services  
• Anticipate order for blood cultures from patient  
• Support medical therapies to reverse shock/sepsis |
| - Caused by the introduction of bacteria at the time of donation, or blood or blood component preparation or administration of blood/blood components. | |                                                                                                                                                           |
| Hypotensive Transfusion Reaction:                 | • Hypotension (drop in SBP by 30 mmHg or more) within 15 minutes of start of transfusion | • Rare reaction that is often seen in patients who are taking ACE inhibitors and there is an unexpected bradykinin release when blood interacts with blood administration filter  
• Stop transfusion immediately  
• Notify physician and Transfusion Services  
• Monitor patient including vital signs  
• Support BP as ordered by physician  
• Do not restart this unit of blood |
<p>| - Drop in systolic or diastolic BP of &gt;30 mm Hg from baseline that occurs within 15 minutes of start of transfusion; BP returns to normal (within 10 minutes) if transfusion is stopped and supportive treatment is initiated. | |                                                                                                                                                           |</p>
<table>
<thead>
<tr>
<th>Reaction Type</th>
<th>Signs/Symptoms</th>
<th>Nursing Actions/Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrate Toxicity Hypocalcemia:</td>
<td>• Tingling in fingers, circumoral tingling • Muscle cramps • Tetany • Carpopedal spasm • Convulsions • Laryngeal spasm • Respiratory arrest</td>
<td>• Infuse blood slowly (citrate reaction less likely to occur), but no longer than 4 hours • Consider calcium supplement when multiple units of blood are transfused • If any signs of tingling or circumoral tingling noted: • Stop transfusion immediately • Maintain patent IV with normal saline • Notify physician and Transfusion Services</td>
</tr>
<tr>
<td>Hyperkalemia: may occur in patients receiving massive blood transfusions, those with renal dysfunction or neonates</td>
<td>• Nausea, diarrhea • Muscle weakness • Flaccid paralysis • Bradycardia • Cardiac arrest</td>
<td>• Monitor potassium level • Washed RBC products may be used for neonates (product expires within 24 hours of washing)</td>
</tr>
<tr>
<td>Hypothermia: Results from rapid administration of multiple blood products</td>
<td>• Drop in body temperature after blood products infused</td>
<td>• Use fluid/blood warmer for massive transfusion or patients requiring multiple blood products within a short period of time (See Fluid/Blood Warmer Policy) • Consider using hyperthermia blanket to warm patient</td>
</tr>
<tr>
<td>DELAYED REACTIONS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delayed Hemolytic Transfusion Reaction (DHTR): Caused by the stimulation of antibody development by foreign red cell antigens. Clinical signs/symptoms of destruction of transfused RBCs; hemolysis is usually extravascular; typically detected 7-14 days after transfusion completed</td>
<td>• Asymptomatic or mild symptoms seen • Unexpected drop in hemoglobin • Mild jaundice • Fever • Hemoglobinuria (dark urine) • May have increase in bilirubin and/or LDH</td>
<td>• Often detected when new Type and Screen or additional units requested for patient • Transfusion Services will notify physician of suspected DHTR • Will require additional time to provide antigen-negative, compatible RBC products for patient</td>
</tr>
<tr>
<td>Transfusion-Related Infectious Disease Transmission: Diseases may include Hepatitis B or C, CMV, Epstein – Barr virus, HIV and others.</td>
<td>• Signs and symptoms of infection typically weeks to months after transfusion</td>
<td>• All blood products are tested for HIV1/2, Hepatitis B, Hepatitis C, Syphilis, HTLV-I/II, and West Nile Virus. Additionally, platelets are tested for bacterial contamination. • Physician will typically notify Transfusion Services or blood center for follow-up investigation</td>
</tr>
<tr>
<td>Graft vs. Host Disease (GVHD): Extremely rare reaction. Transfused donor lymphocytes become engrafted in tissues and bone marrow of recipient; donor lymphocytes proliferate and destroy the patient’s tissues. Can occur from 2 days to 6 weeks following transfusion.</td>
<td>• Fever • Maculopapular rash • Hepatomegaly • Diarrhea • Liver dysfunction • Decreased WBC</td>
<td>• Irradiation of the blood product prevents this reaction in susceptible patients • Blood donations from family members are irradiated to prevent GVHD • HLA-matched platelet products must be irradiated to prevent GVHD • Verify product modifications during bedside check prior to transfusion</td>
</tr>
</tbody>
</table>