Beebe Healthcare

Patient Care Manual

Blood: Transfusion of Blood and Blood Components	Date Issued: 5/82
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PURPOSE
The purpose of the policy is to detail best practice, to reduce the potential risk of transfusion errors, and to assist personnel with all aspects related to blood and blood component transfusion.

SCOPE
Patient Care and Blood Bank

POLICY
Blood and blood products are viewed as prescribed intravenous medication. It is the responsibility of all physicians and care providers for the recipient or the potential recipient to understand the significance of the procedures related to the:

- Explanation of a transfusion
- Options of alternatives to transfusion
- Ordering/requesting of the blood/blood product
- Transfusion process
- Collection of the Pre-transfusion blood sample
- Outcome of the transfusion

All are responsible for maintaining and updating their knowledge.

Personnel who participate in the administration of blood components must be trained in the transfusion procedures and management of adverse events.

PROCEDURE
1. <u>Recipient Consent</u>

Prior to placing a request for a blood product, explain to the patient or designated-decision maker, the purpose, the benefits and the risks of a blood transfusion, and the alternatives to transfusion of allogeneic

blood components. The patient should have the opportunity to ask questions. The transfusionist will ensure there is a signed consent form (Form # 10199) prior to initiating a transfusion.

2. Ordering the Product and Transfusing

A physician or other licensed care provider (Nurse Practitioner (NP) or Physician Assistant (PA)) is responsible for prescribing the order for the transfusion of blood and blood components. The order contains:

- Name of the product
- Number of units
- Pre- or post-medication
  - Pre-medication, if requested, should be administered PRIOR to requesting the blood product being sent to the patient care area for the transfusion.
  - If the medication is given orally, the transfusionist should wait 30 to 60 minutes before initiating the transfusion. If the medication is given intravenously, a 10-minute wait PRIOR to initiating the transfusion is adequate.
- Reason for transfusion or potential transfusion
- A type and screen does **not** need to be requested with the product order. If the patient does not have a current blood bank sample, a type and screen order with the same priority request as the product order will be generated by the laboratory computer system.
- A crossmatch does **not** need to be requested when red blood cells are ordered. If the patient does not have a current crossmatch order one will be added to the patient's type and screen by the laboratory computer system.

3. Specimen For Pre-Transfusion Testing (Pre-Analytical)

Blood Bank samples expire at midnight three days from the date of collection. The day of collection is counted as day zero. Valid Alternative Patient Identification (API) samples for pre-op patients expire at midnight 14 days from the date of collection **or** 3 days after the patient has been admitted, whichever comes first.

4. Emergency Release

Uncrossmatched blood may be requested by a provider in life-threatening situations. The blood bank will dispense uncrossmatched red blood cells within 7 minutes of receipt of a verbal request. The Emergency Transfusion Request must be signed by the requesting provider (or nurse on his/her behalf) at the time of the product / patient identification check.

ABO Group compatible blood will be dispensed if the patient's ABO has been determined from a **current** blood bank sample. Historical ABO results are not valid in this situation.
NOTE: The requesting provider will be notified immediately if historical data reveals previous compatibility issues (i.e. previous antibody identification).

If the ABO is unknown or not tested using a current sample, **O Negative or O Positive Red Blood Cells and group AB or Low Titer group A plasma will be dispensed.**

5. Available Products and Typical Turn Around Times with Current Type and Screen, no antibodies

- Leukocyte-Reduced Red Blood Cells: Crossmatched within 15 minutes
- Fresh Frozen Plasma (FFP): Approximate thaw and prep time is 25 minutes
- Platelets, Pheresis; Single donor units: Dispensed within 10 minutes as long as available on-site

- Cryoprecipitated, AHF (CRYO): 5-unit pools are available. Approximate thaw and prep time is 20 minutes
- If the patient does **not** have a current type and screen, Blood Bank will be able to dispense crossmatched red blood cells and ABO compatible components within 45 minutes of receipt of a properly labeled blood bank specimen as long as the antibody screen is negative and the patient has no history of exhibiting clinically significant antibodies.
- Least incompatible red blood cells for patients exhibiting warm autoantibodies (or other conditions / medications that interfere with crossmatch procedures) will be available after the presence of underlying alloantibodies has been ruled out. Testing is performed by our blood supplier with results generally available within 24 hours.
- Products Available as Special Order
  - Cytomegalovirus (CMV) negative: generally available on-site, minimum of 3 hours required if the product must be ordered
  - Irradiated Red Blood Cells and Platelets: minimum of 3 hours
  - Human Leukocyte Antigen (HLA) matched: 1-3 days
  - Pathogen Reduced Platelets: erratic availability but are equivalent to irradiated and CMV negative platelet products
- Pre-Transfusion Planning: Autologous and Directed Donor Red Blood Cells
  This program is managed by the Blood Bank of Delmarva, INC (BBD), Beebe Healthcare's blood product supplier. These products require special paperwork and detailed handling. Coordination among the ordering physician, the patient and family, and BBD is necessary to ensure product is available when needed.

  General information and instructions may be obtained from the BBD Program Coordinator at 302-737-8405 EXT 789 or 1-888-825-6638. Application forms may be obtained from the Beebe Healthcare Blood Bank.

  There will be a processing fee charged even if the product is not transfused.

See "**Circular of Information for the Use of Human Blood and Blood Components"** for additional information (located in the online policy manual: Laboratory/Blood Bank)

For the general patient care areas, only 1 product is dispensed at one time per patient.

Special cooler storage arrangements are available for the Emergency Department, ICU, Dialysis, Tunnell Cancer Center and the main hospital Operating Suites for dispense of more than one product per patient.

6. Obtaining the Product (Main Hospital Campus)

- Blood Bank Technologists will notify the patient care area (either verbally or electronically) when the blood product is available or if there is a delay in providing a requested product.
- Prior to requesting blood product be dispensed, nursing:
  - Verifies there is a signed blood consent form
  - Pre-medicates the patient, if applicable
  - Verifies appropriate vascular access device (VAD) is present & patent
    - Based on vein size and patient population, peripheral IV (PIV) 22 gauge and larger is appropriate for routine administration
    - Large bore (14-18 gauge) PIV is recommended for rapid transfusion

- Central venous catheters (CVC)/PICCs/Midlines are appropriate devices for routine and rapid transfusions. PICCs & midlines- infusion may be slower based on catheter length & lumen size.

- Intraosseous (IO) devices may be used for routine or rapid transfusion of blood products. Consider humeral head as optimal site for rapid IO transfusion. Always confirm patency prior to infusion.

  - Verifies the patient has a completed hospital identification wristband and a completed Blood Bank Identification (BBID) wristband attached to their body
  - Documents pre-transfusion vital signs (Temperature, Pulse, Blood Pressure, Respiration (TPBR)) in the patients Electronic Health Record (EHR) or appropriate computer downtime form.

- Once pre-transfusion tasks are complete, nursing fills out the first section of the *Blood Product Transport Request* (Form # 10013) and sends the form to Blood Bank.
  - The patient's BBID number should be provided on the form, either a red BBID alphanumeric sticker **or a handwritten version** of the alphanumeric number.
  - The form may be omitted during emergent / life-threatening situations.
- The Blood Bank Technologist dispenses the requested product to the patient care area. **Only Transfusion Service Personnel may remove a blood product from a Transfusion Service Storage Refrigerator, Freezer, or Platelet Incubator.**
- During the dispense process, the following are verified per Blood Bank protocol:
  - product and patient identifiers
  - compatibility interpretation
  - special transfusion requirements
  - expiration date and time, as well as date and time of dispense
  - labeling is complete and intact Before dispensing the product,
  - product does not display any discoloration or loss of bag integrity

METHODS OF TRANSPORT

1. PNEUMATIC TUBE

- The Blood Bank Technologist compares information on the *Blood Product Transport Request* (Form # 10013) with that on the patient product *Crossmatch or Component Label* and sends the product to the designated patient care location tube station.
- Nursing acknowledges receipt of the blood product (correct patient and product requested) by completing the receipt section of the *Blood Product Transport Request.*
  - **White** copy of the form is placed on the patient's chart to be scanned into the HER
  - **Yellow** copy is returned to Blood Bank.

2. MANUAL TRANSPORT

- The Transporter will present to the Blood Bank with the *Blood Product Transport Request* (Form # 10013) or will use the Transport Request form that is in Blood Bank (as the request form may already be in the Blood Bank).
- Comparisons of information as in the Pneumatic Tube transport will occur.
- The Transporter will be allowed to deliver for one patient per location.
  - The Blood Bank Technologist will ensure the hospital transporter understands to expedite the delivery to the patient care location.
- The Transporter will sign the *Blood Product Transport Request.*
- Nursing acknowledges receipt of the blood product (correct patient and product requested) by completing the receipt section of the *Blood Product Transport Request.*
  - **White** copy of the form is placed on the patient's chart to be scanned into the HER

- **Yellow** copy is returned to the Blood Bank.

7. Obtaining the Product (Tunnell Cancer Center)

- Product to be transfused at Tunnell Cancer Center (TCC) is transported by courier from Beebe Healthcare Transfusion Service to TCC. The transport, delivery and dispense of product is documented on the *Transfusion Service Blood Shipping/Issue form (FB2000.030)*. Upon arrival at TCC, product is placed in appropriate storage by a Laboratory Technologist until dispensed for transfusion.
- A Laboratory Technologist will notify the infusion area when the blood product is delivered.
- Prior to requesting blood product be dispensed, nursing:
  - Verifies there is a signed blood consent form
  - Pre-medicates the patient, if applicable
  - Verifies appropriate vascular access device (VAD) is present & patent
    - Based on vein size and patient population, peripheral IV (PIV) 22 gauge and larger is appropriate for routine administration
    - Central venous catheters (CVC)/PICCs/Midlines are appropriate devices for routine and rapid transfusions. PICCs & midlines- infusion may be slower based on catheter length & lumen size.
  - Verifies the patient has a completed Blood Bank Identification (BBID) wristband attached to their body.
  - Documents pre-transfusion vital signs Temperature, Pulse, Blood Pressure, and Respiration (TPBR) in the patients Electronic Health Record (EHR) or appropriate computer downtime form.
- Once pre-transfusion checks are complete and the transfusionist is ready to begin the infusion, nursing or medical personnel present to the Medical Office Building (MOB) laboratory with a label containing:
  - patient identifiers (patient name, date of birth and medical record number)
  - Current BBID# (red sticker from patient's blood bank armband or hand written)
  - Name of product being requested

- Nursing / medical personnel present the label to the Laboratory Technologist. If all required information is present, the Laboratory Technologist removes the requested product from storage and reexamines for breakage, contamination, hemolysis, clots, and attached segments (RBCs only). **Only trained Laboratory Personnel are to remove blood products from the storage area for issue.**
- Nursing / medical personnel and Laboratory Technologist verify patient and unit identifiers on:
  - Label attached to product
  - Transfusion Service Blood Shipping / Issue Form
  - Label provided by nursing
- Discrepancies must be resolved before proceeding.

- The label provided by nursing is applied to page 2 of the Transfusion Service Blood Shipping / Issue Form. Nursing / medical personnel completes date, time and signature in the space provided next to the applied label to document dispense request and product receipt.
- Laboratory Technologist documents dispense by completing TCC ISSUE column on Transfusion Service Blood Shipping / Issue Form.

8. Receipt of Product at the Patient's Bedside

Transfusions are to be initiated as soon as the product arrives in the patient care / infusion area. If there is going to be a delay, the product must be returned to the Blood Bank (or MOB laboratory) unless a validated temporary storage container is available.

Return of Product for Re-dispense
Blood Bank will inspect all returned product to verify the product meets re-dispense criteria (temperature and appearance). If acceptable, the product will be placed in appropriate storage until re-dispensed or released. If the product is deemed unacceptable, a *Wasted* Unit form will be initiated by the Blood Bank and may be forwarded to the nurse manager of the patient care area.

Any **spiked** product that will **not** be transfused within 4 hours of being dispensed from blood bank (or removed from a validated temporary storage cooler) is to be discarded in the patient care area unless there is an adverse transfusion reaction workup, in which case the product must be **manually** delivered to the blood bank. **DO NOT USE THE PNEUMATIC TUBE SYSTEM TO TRANSPORT SPIKED PRODUCT.**

9. Initiating the Transfusion

Equipment needed:

- Y tube blood solution pump set with 170 to 260 micron filter
- Infusion pump or Rapid Infuser
- 0.9% saline solution 500 mL bag
- Vital signs measuring equipment
- Fluid warmer (available from the Emergency Department, ICU, and Anesthesia) – used for rapid blood infusion and patients with clinically significant cold agglutinins.

Compatible Intravenous solution – No medications or solutions other than 0.9% sodium chloride injection (*USP) are to be administered simultaneously with blood products through the same tubing.

Patient and Product Identification Checks
Most fatal transfusion events occur because oversights are made during the pre-transfusion positive identification verification checks.

If possible, have the patient state their full name and date of birth and confirm the identification on the *Crossmatch or Component Label* attached to the blood bag.

All identification attached to the blood bag must remain attached until the transfusion has been terminated.

Two nurses confirm the following information at the patient's bedside/chairside and document the checks occurred in the EHR:

- A consent for blood transfusion has been signed
- Patient is wearing a completed hospital ID
- Patient is wearing a completed blood bank ID band

- Patient information (name, DOB, MR#, BBID#) on identification bands attached to the patient matches the information on the *Crossmatch or Component Label* attached to the product and the patient identification information in the EHR.
- Product received matches the transfuse order (i.e. RBCs ordered, RBCs being transfused)
- The product has not passed its expiration date
- The blood bag shows no sign of damage that could compromise product quality
- Color and appearance of the product is acceptable
- No errors occur when scanning the donor blood bag label in the Bridge application.

Any discrepancy or error must be addressed before proceeding with the transfusion.

If an error is generated during the scanning process, the transfusionist will:

- Make note of the error and attempt to identify the source of the error. For instance, if a name mismatch error is generated, compare the name displaying in Bridge to the printed name on the tag attached to the blood bag.
- Immediately provide blood bank (X3569) details regarding the error.

Blood Bank and the transfusionist will compare all patient identifiers in the Cerner applications (Powerchart, Bridge, Pathnet) as well as the product order, blood bank specimen label and blood bag tag.

- Depending upon the nature of the discrepancy and the urgency of the transfusion, blood bank will either:
  - request the product be returned
  - provide a downtime paper transfusion record for nursing to use to document
  - provide a new blood bag tag
  - approve use of the IView Blood Product Administration band
  - approve use of the rapid start function in the Bridge Application
- Mismatch errors generated by a **minor name discrepancy** (middle name, middle initial, suffix) need not cause a delay in patient care as long as the issue is thoroughly reviewed by the transfusionist and blood bank technologist **and** all other patient identifiers (first/last name, MRN, DOB, BBID#) agree.
- Blood product must be returned to blood bank if an error is generated by any difference **other than a minor name discrepancy**. If an error other than a minor name discrepancy occurs in an emergent situation, blood bank will follow the emergency release process and dispense uncrossmatched / universal type product for transfusion.

COMPATIBILITY CHART

Patient ABO Group	Compatible RBC's	Compatible Plasma
A	A, O	A, AB
B	B, O	B, AB, low titer A
AB	AB, A, B, O	AB, low titer A
O	O	O, A, B, AB

When transfusing CRYO and Platelet Products, all ABO Groups are acceptable. Components compatible with the recipient's red blood cells are preferred.

Patient's Rh Type	RBC's Rh Type for Transfusion	Plasma Rh Type for Transfusion
Positive	Positive or Negative	Rh type not required for plasma

Negative	Negative **	Rh type not required for plasma
**** In life-threatening situations and when Rh Negative RBCs are unavailable, Rh Positive RBCs may be transfused to a Rh Negative patient.**		

Procedure:

A. Prime Y type infuser set with saline. A new Y tube blood administration set is used for each unit of blood if using an intravenous Infusion Pump. If using a Rapid infuser, the filter is changed per manufacturer's recommendation.
B. Invert red blood cell products gently to mix the cells.
C. Suspend the product on the IV pole. Spike the container. **Prime the tubing with the blood product.**
D. Unless otherwise ordered, start the infusion at 50 mL/hour for the first 15 minutes. Document the date time, and initial flow rate in the EHR.
E. Closely observe the patient for the first 15 minutes for adverse reactions such as :
   - Cyanosis
   - Shortness of breath
   - Itching
   - Rash
   - Chills
   - Hypotension
   - Tachycardia
   - Patient reported symptoms or discomforts
     If any symptoms are observed, stop the transfusion immediately and follow the procedure outlined in the policy *Adverse Transfusion Reaction*. Document the symptoms observed and actions taken in the EHR.

F. Obtain the vital signs (TPBR) after the 15 minutes and document in the EHR.
G. If there are no signs or symptoms of an adverse reaction, increase the infusion rate as ordered or to the recommended infusion rate of:
   - 125 mL/hour or as rapidly as tolerated by the patient for Red Blood Cells
   - 300 mL/hour or as rapidly as tolerated by the patient for Plasma and Platelets
   - CRYO may be infused as rapidly as tolerated by the patient after the first 15 minutes
H. In the absence of ongoing and rapid blood loss, the rate of transfusion for patients at high risk for Transfusion-Associated Circulatory Overload (TACO) should not exceed 120 mL/hour. Pre-transfusion diuretics should be administered and the patient's volume status should be assessed between units if more than one unit is to be transfused. Risk factors for TACO include extreme age, left ventricular dysfunction, renal disease, a history of CHF, female gender, recent vasopressors and positive fluid balance.
I. Obtain vital signs every hour until the transfusion is complete and document in the EHR.
   1) Example Timeline for a 4 hour PRBC transfusion: If the transfusion is initiated at 0800, vitals will be taken at 0815, 0915, 1015, 1115, 1200 (blood product complete) **<u>and</u>** anytime between 1201 – 1230 (for post-transfusion).

J. <u>Exceptions for Dialysis Service</u>
   1) Start the infusion at 125 mL/hour for the first 10 minutes. If there are no noted adverse reactions, slowly increase the flow rate. During the dialysis, as long as the patient tolerates the administration of blood, the red blood cells may be infused over 30 – 45 minutes/unit.
   2) The patient must be dialyzed at least 30 minutes after the transfusion to decrease the potential of "post-transfusion-hyperkalemia."
   3) Record of the transfusion will be recorded on the Dialysis Treatment Flow sheet and in the EHR.

K. Exception for Tunnell Cancer Center
   1) Pre-medicate the patient as per the orders of the provider.
   2) If there is no adverse reaction after the first 15 minutes of the transfusion, the infusion rate will be increased to allow blood to run over 1.5 – 2 hours, plasma products to run over 30 – 60 minutes or as ordered by the provider.
   3) Document the activities in the patient's EHR.
   4) Varian may be used to document transfusions if the Bridge application is unavailable.

L. Exceptions for Operating Rooms
   1) The Bridge application is used to perform electronic pre-transfusion positive patient identification and to document blood product name and unit number of products transfused in the OR.
   2) The transfusion process is managed by Anesthesia or Perfusion. Actual volumes and transfusion times are documented in the Anesthesia or Perfusion record.
   3) Transfusion start and end times documented in the Bridge application may not reflect the actual times.

10. Transfusion Completion

A. Blood products must be transfused within 4 hours of being dispensed from blood bank (or removed from a validated temporary storage cooler). If necessary, the infusion rate may be increased during the last hour to meet the time limit.
B. When the transfusion is complete, flush tubing and extension set with 0.9% normal saline and disconnect
C. Document in the EHR:
   - Date and time of completion
   - Volume infused
   - Indicate if there were any adverse reactions
D. Obtain vital signs (TPBR) within 30 minutes post-transfusion and document in the EHR.
E. Discard the empty product bag into biohazard waste. If a transfusion reaction is suspected, the product bag must be returned to the blood bank.
F. If the patient is being discharged after the blood product transfusion, provide them with Blood Transfusion After Care Patient Education Instructions or form M-1230 Instructions to Outpatients Following Transfusions.

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