Institutional Handbook of Operating Procedures Policy 09.13.29	
Section: Clinical	Responsible Vice President: SVP, Chief Medical & Clinical Innovation Officer
Subject: General Clinical Procedures and Care	Responsible Entity: Nursing Services

I. Title

Transfusion of Blood Components

II. Policy

A. An informed patient consent for blood component(s) transfusion must be obtained prior to a transfusion (Form #6549).

1. A new consent must be obtained for each admission for inpatients.
2. A new consent must be obtained at least once every 12 months for outpatients.
3. For emergent situations, follow IHOP - 09.03.17 - Consent - Overview and Basic Requirements.
4. For individuals with Limited English Proficiency (LEP) or who are hearing impaired, refer to IHOP – 09.05.35 – Patient Centered Communication.
    a. UTMB Language Assistance Office, 409-747-2121; if you cannot access the Language Assistance Office, contact the UTMB paging operator 409-772-4004.
5. For Blood Transfusion Consents frequently asked questions, refer to Consent FAQs.

B. A physician order for transfusion must be present in the medical record.

C. Compatibility samples (Type and Screen sample to be used for transfusion) must be drawn prior to transfusion.

1. Compatibility testing is to be repeated every 3 days, as indicated. The type and screen sample expires at midnight on the 3rd day after it was drawn.
    a. EXCEPTION for infants:
        i. A neonate Type and Screen is valid until discharge or until they reach 4 months of age. At 4 months of age, compatibility testing must be repeated every 3 days as indicated.

D. Only a Registered Nurse (RN) or an Advanced Practice Professional (APP) may initiate the administration of blood components.

E. Patient transport while blood component is infusing should be avoided unless absolutely necessary. If transport is necessary, the patient must remain under the observation of an RN or APP. It is critical to notify the Blood Bank of the patient's new location if additional blood components are ordered.

1. If a patient is transferred out of UTMB via Emergency Medical Services (EMS) to another UTMB facility or non-UTMB facility, use Flowsheet action "Transferred to EMS with blood infusing."

*NOTE: If a patient transfers between UTMB campuses, they will need a new compatibility sample collected.

F. For ECMO patients, the Extracorporeal Life Support (ECLS) certified perfusionist, ECMO-trained Respiratory Therapist, or Registered Nurse may initiate and administer blood components.

G. Uncrossmatched units of Group O red blood cells may be given only in life-threatening emergency situations when ordered as medically necessary by a licensed physician. Using Blood Bank Division Primary Request form, the ordering physician must sign an Emergency Release of Blood Products waiver – Downtime/Waiver – Form BB10 "UTMB Laboratories Blood Bank Requisition Form.." The signature can be obtained after the emergency release of products.

1. A pre-transfusion sample for compatibility testing should be obtained prior to the initiation of the uncrossmatched transfusion. Send this specimen to the Blood Bank as soon as possible. See section III. Procedure A. Pre-Transfusion for compatibility specimen collection process.

For Massive Transfusion or Emergency Release of blood products, refer to IHOP – 09.13.47 – Massive Transfusion Protocol – Adult and Obstetric.

H. If Rh positive blood has been transfused to an Rh negative female of childbearing potential (<55 years of age), the Blood Bank physician will advise the patient's physician about the treatment options, including possible administration of an appropriate dose of Rh immune globulin within 72 hours of transfusion.

I. **Patient/Family Education**

Patient/family education will be completed and documented on the appropriate patient records. Written instructions concerning adverse events are provided to the patient and/ or responsible caregiver if a transfusion was administered.

III. Procedure

A. Pre-Transfusion

1. Compatibility Testing

a. Blood sample(s) for compatibility testing (Type and Screen for use of transfusion) may only be collected by RNs or APPs. Exceptions may be made in special circumstances with prior approval of the Blood Bank Medical Director.

b. Samples should be drawn in lavender top EDTA tubes and labeled with the patient's identifiers matching their attached armband.

i. If utilizing the downtime process (Downtime/Waiver – Form BB10), accompanying paper order must also be compared to the attached armband and labeled sample to ensure matching name and MRN. Labeling should be completed at the bedside immediately following collection. See section III. Procedure C. Downtime – Specimen Collection and Transfusion for downtime specimen collection.

c. Infants less than 1 year of age: submit two EDTA MAP tubes to provide a total sample volume of at least 1 mL.

d. **Blood Bank Inpatient Beaker Collection**: (Utilize Epic to collect **OR** use the downtime process – DO NOT MIX both processes).

i. From the "Brain" or Worklist, print Beaker label(s) of specimen(s) needing to be collected.

ii. Gather all materials needed for collection.

iii. Properly identify the patient (Name, DOB, MRN).

iv. Collect sample(s) and LABEL at bedside.

v. Specimen tube label MUST include:

I. Patient's full name (first and last)

II. Patient's medical record number

vi. Perform Positive Patient Identification (PPID)
   I. Scan patient's attached armband.
   II. Scan LABELED specimen.

vii. Save and document collection into Epic.
   I. MUST click "Accept" for collection action to save

viii. Recheck for accuracy before sending sample to Blood Bank.

e. **Blood Bank Emergency Department (ED) Beaker Collection:** (Utilize Epic to collect **OR** use the downtime process – DO NOT MIX both processes).
   i. In ED Narrator – "Lab Collect," print Beaker label(s) of Specimen(s) needing to be collected (if not already auto-printed).
   ii. Gather all materials needed for collection.
   iii. Properly identify the patient (Name, DOB, MRN).
   iv. Collect sample(s) and LABEL at bedside.
   v. Specimen tube label MUST include:
      I. Patient's full name (first and last)
      II. Patient's medical record number
   vi. Perform Positive Patient Identification (PPID)
      I. Scan patient's attached armband.
      II. Scan LABELED specimen.
   vii. Save and document collection into Epic
      I. MUST click "Accept" for collection action to save
   viii. Recheck for accuracy before sending sample to Blood Bank.

f. **For downtime specimen collection, see section III. Procedure C. Downtime – Specimen Collection and Transfusion.**

g. For any patient that does not have a historical blood type on file in the Blood Bank, an ABORh Confirmation sample will be required. The second sample must be drawn at a different time than the initial Type and Screen sample.
   i. The Blood Bank will immediately notify the patient's nurse when a confirmation sample is required and place the order for the ABORh Confirmation in Epic.
   ii. Collect the ABORh Confirmation sample using a lavender top EDTA tube. The same specimen labeling requirements apply for confirmation samples. (Utilize Epic to collect **OR** use the downtime process – DO NOT MIX both processes).

h. For Transfusion Services (Adult & Pediatric) STAT Turn Around Times, see chart below.

PRODUCT PROCEDURE	PRE-REQUISITE	TAT
Type and Screen	Receipt of acceptable specimen; Negative Antibody Screen*	60 minutes
ABORh Confirmation	Receipt of acceptable specimen	30 minutes
Crossmatch (Red Blood Cells)	Receipt of acceptable specimen; Complete Type and Screen with Negative Antibody Screen** Complete 2nd ABO/Rh Confirmation	15 minutes
Crossmatch additional units	Receipt of acceptable specimen; Complete Type and Screen with Negative Antibody Screen** Complete 2nd ABO/Rh Confirmation	15 minutes

Uncrossmatched RBCs – O Negative	Verbal confirmation that physician will sign waiver; collection of specimen	10 minutes
Uncrossmatched RBCs – Type Specific	Verbal confirmation that physician will sign waiver; Receipt of specimen and 2nd ABO/Rh Confirmation	10 minutes
Fresh Frozen Plasma	Blood type on record for current admission If no blood type on record on current admission; receipt of acceptable specimen.	30 minutes 1 hour
Platelets	Blood type on record for current admission If no blood type on record on current admission; receipt of acceptable specimen.	15 minutes 1 hour
Cryoprecipitate (pooled)	Blood type on record for current admission If no blood type on record on current admission; receipt of acceptable specimen.	15 minutes 1 hour
*All TATs dependent on availability of blood component. Special transfusion requirements (ex.: CMV negative, Irradiated, Hgb S negative, will lengthen TAT). **If antibody screen in positive, TAT dependent on complexity of antibody ID. The physician will be notified by the Transfusion Medicine Resident/Faculty of delays in testing for "STAT" or "To Give" orders, and when blood or blood components are unavailable.		

2. **Consents**
   a. Blood Component(s) should not be picked up from the Blood Bank until consent for administration has been verified and the RN or AAP is ready to start the transfusion. RN or APP must also confirm a consent for blood component(s) administration has been duly signed and witnessed.
      i. Acknowledgement of consent is required for **EVERY unit transfused**
         I. **Example**: If you give 4 units on your shift, must acknowledge consent has been obtained for all 4 units.
      ii. Acknowledgement Location:
         I. **Inpatient:** Flowsheet; **Emergency Department:** ED Narrator
         II. **Reason:** Blood Product Administration Module (BPAM) Compliance Dashboard pulls the 11 required metrics from the Flowsheet documentation.
      iii. Consent Timeframe:
         I. Obtained 1 hour prior to the start of **each** unit transfused.
         II. **Reason**: Sometimes a single patient will receive multiple transfusions, 1 hour time limit was set to account for that.

3. **Pre-Transfusion Vitals** (Must include ALL FOUR): •Temperature; •Blood Pressure; •Respiration; •Pulse (and/or Heart Rate)

   a. **Timeframe:** Within 30 minutes prior to or at start of transfusion.

   b. **Recommendation:** 30 minutes before picking up the product.

   c. **Reason:** If patient spiked a fever and decision is made to not transfuse, it lessens the likelihood of that unit being wasted (will likely be out of temperature upon return to Blood Bank).

4. **Dispensing Process**
   a. Blood component(s) should not be picked up from Blood Bank until consent for administration has been verified and the RN or AAP is ready to start the transfusion.

   b. Prior to picking up blood component(s), confirm there is an order to transfuse.

   c. Each transporter may only pick up blood product(s) for one patient at a time.

   d. Transporter must be an on-duty UTMB employee and display badge at all times.
      i. Each transporter must complete the annual Blood and Blood Products Pickup and Transport Module. Additionally, no students will be permitted to transport and pickup from the Blood Bank.
      ii. No food or drink is allowed while handling blood and blood products from the Blood Bank.
      iii. Cellphone use is also prohibited during the dispensing process.

   e. The dispense request form will be submitted in person to the Blood Bank with the following information:
      i. Patient's full name (first and last)
      ii. Patient's medical record number
      iii. RN or APP signature (if using downtime dispensing sheet)
      iv. Blood Component(s) to be dispensed
      v. Transporter's name
      vi. Transporter's employee ID number
      vii. Consent (Y/N)

   f. Once dispensed, blood component(s) must be immediately transported directly to the RN or APP requesting the component for transfusion.
      i. The transfusion should be started as soon as possible and completed within 4-hours from time of issue.
         I. If the anticipated infusion rate must be so slow that the entire unit cannot be infused within 4 hours, it is appropriate to order smaller aliquots for transfusion.

   g. If blood component(s) are issued in a cooler:
      i. <u>Visual Expiration Notification</u>: Every cooler issued from the Blood Bank will contain a cooler tag placed on the outside of the cooler for visual notification of cooler expiration (date/time cooler expires).
         I. Cooler tag on the outside of the cooler will also contain patient information (MRN and patient's full name) along with the amount and product(s) issued in the cooler (products are NOT interchangeable between coolers).
      ii. <u>Audible Expiration Notification</u>: Every cooler issued from the Blood Bank will contain a timer on the outside of the cooler that is set to alarm for audible notification of cooler expiration.
      iii. Coolers are validated to maintain acceptable temperatures for a specific amount and component type over a limited time. The cooler must be returned to the Blood Bank at or before the cooler date/time expiration.

5. **Verification Process (Dual Sign)**
   a. Prior to transfusion, verify the component(s) ordered and any special processing needs for the component(s).

i. Example: irradiated or leukocyte reduced. **Neonates and infants under 12 months of age** will receive leukocyte reduced (same as CMV-safe) and irradiated cellular blood components. Psoralen treatment or gamma irradiation are both acceptable methods to prevent transfusion associated graft versus host disease (TA-GVHD). A psoralen-treated platelet may be administered when an irradiated platelet is ordered

b. A bedside or chairside verification process will be conducted by 2 individuals (RNs and/or APPs) who will be responsible for administering the blood component(s) to the patient.

c. During the 2 person bedside/chairside verification process, the following will be confirmed:
   i. The patient identifiers on the Blood Transfusion Record Tag attached to the blood component match the patient identifiers on the armband attached to the patient:
      I. Patient's full name (first and last)
      II. Patient's MRN

      The patient should participate in identification if possible.
   ii. The information on the transfusion tag attached to the blood component matches the blood component(s) label:
      I. type of blood component: packed red blood cells, platelets, plasma, cryoprecipitate
      II. donor unit ID #
      III. expiration date and time of blood component(s)
   iii. The blood component to be transfused is compatible with the patient's blood type. Refer to Transfusion Service Compatibility Chart (See Appendix A).
   iv. The interpretation of crossmatch tests, if applicable.
   v. The dual sign-off is completed:
      I. in the Epic Blood Product Administration Module (BPAM) or using the downtime workflow if needed (see section III. Procedure C. Downtime – Specimen Collection and Transfusion).
      II. If the downtime transfusion workflow is not used, the transfusion tag may be discarded in the blue bin for patient protected information. If in the Operating Room, the tag may be discarded in the red biohazard bag along with the unit.

d. Unit tag is to remain attached to the unit until transfusion is complete.

*NOTE: If there is any discrepancy or question in verification process, do not administer the blood component(s) and notify the Blood Bank immediately.

B. **Blood component(s) administration**

1. **Initiate the transfusion**

a. Blood components should be transfused without delay upon arrival to unit (except when issued in a Blood Bank cooler).
   i. The transfusion should be started as soon as possible and completed within 4-hours from time of issue.
   ii. If the anticipated infusion rate must be so slow that the entire unit cannot be infused within 4 hours, it is appropriate to order smaller aliquots for transfusion.

b. Acceptable administration routes:
   i. **Adult and pediatric:** Blood component(s) will be administered intravenously (unless otherwise specified by provider order) through a 14 to 24 gauge lumen.
   ii. **Neonatal:** Peripheral IV with a 22 or 24 gauge lumen is an acceptable route of administration. For non-exchange transfusions, umbilical artery catheter (UAC) is for packed red blood cells only. The umbilical venous catheter (UVC) – second port, may be used with faculty physician order. The second port of the UVC can be used for cryoprecipitate, plasma, platelets and packed red blood cells. Peripherally Inserted Central Catheter (PICC) lines are never to be used for blood component transfusion in neonates.

c. All components will be transfused through a standard Y-type blood administration set with a 170-260 micron filter.
   i. **Exception**: Blood syringes have been pre-filtered with a 150 micron filter in the Blood Bank so no additional filtration is needed. Neonates only: Use Baxter extension tubing (34") volume 3.9 mL (larger than microbore tubing) for administration.

d. The blood administration set can be used for up to 4 units or no more than 4 hours whichever occurs first.
   i. **Exception**: With blood supplied in a syringe from the Blood Bank, a new tubing set is used with each syringe.

e. Only 0.9% NaCl or Plasmalyte should be used for priming and administering blood component(s). Lactated Ringers Solution should never be used for blood administration.

f. Do not infuse blood components into lines also infusing medications or IV fluids.

g. No medications will be added to the blood component(s) or administered through the administration tubing set. If medication must be administered while blood components are infusing and a separate line is not available, stop the transfusion. Flush the line, administer the medication, flush the line again and then restart the transfusion.

h. Do not piggyback blood components.

i. With the exception of rapid infusions in the Operating Room and emergent situations, the transfusion flow rate should be slower during the first 15 minutes. For Massive Transfusion refer to IHOP – 09.13.47 – Massive Transfusion Protocol – Adult and Obstetric. If the patient exhibits no reaction signs or symptoms, the rate should be increased after 15 minutes to ensure the product is completed within the 4 hour window. See below chart for recommended adult flow rates.

j. For recipients at risk of fluid overload (pediatric or elderly), a slower flow rate should be used (as low as 1 mL/kg/hour). Would be appropriate to order smaller volume or aliquots for transfusion.

Suggested Maximum Adult Flow Rates		
Product	**First 15 minutes**	**After 15 minutes**
Red blood cells	1-2 mL/minute	240 mL/hour or as tolerated
Plasma	2-5 mL/minute	300 mL/hour or as tolerated

Platelets	2-5 mL/minute	300 mL/hour or as tolerated
Cryoprecipitate	As rapidly as tolerated	As rapidly as tolerated

Adapted from AABB Technical Manual, 21st edition

2. **Intra Vitals (15-minute vitals):**

(Must include ALL FOUR)

•Temperature •Blood Pressure •Respiration •Pulse (and/or Heart Rate)

a. **Timeframe:** 15–20 minutes after blood initiated.

3. **Assessment and Monitoring**

a. Vital signs will be taken and recorded prior to transfusion (within 30 minutes prior to or at transfusion initiation) and 15-20 minutes after beginning transfusion.

b. A final set of vital signs will be taken and recorded at or within 30 minutes of the conclusion of the transfusion.

c. Patients receiving a transfusion will be continuously assessed at the bedside for signs and symptoms of transfusion reactions and complications for the first 15 minutes and re-assessed with each set of vital signs.

d. Additional vital signs during the transfusion are per unit routine or more frequently as condition warrants.

i. Neonates and Pediatrics: Vital signs will be taken at 15-20 minutes, then hourly until completion of the transfusion.

4. **Complete the Transfusion**

a. Transfusion must be completed within 4 hours from the time the product was issued from the Blood Bank.

b. When the blood component(s) transfusion is complete, flush the tubing. **(**Neonates: Flush with 1 to 3 mL of 0.9% NaCl. Do not use ¼ or ½ strength saline).

c. Before disposal, ensure the patient information tag from the component is removed and placed in the blue recycle bin for patient protected information or covered with an identity-concealing privacy label. Then discard the empty blood bag and tubing or blood syringe in a biohazard receptacle if no additional blood is to be infused and no transfusion reaction is suspected.

d. Ensure steps are appropriately documented in the Epic BPAM Flowsheet, except as provided by IHOP – 09.13.47 – Massive Transfusion Protocol – Adult and Obstetric.

i. Correct action documented for completion of transfusion – without intent to restart the transfusion – action change should be “Blood Completed.”

ii. Document the total volume transfused.

iii. Answer Y/N for Suspected Transfusion Reaction

I. If “Y” is selected, add description of any suspected transfusion reaction symptoms, and notification of the physician.

iv. Take a set of Post-Vitals at or within 30 minutes of completing the transfusion – must include all four: Temperature, Blood Pressure, Respiration, and Pulse (and/or Heart Rate).

v. Volume of 0.9 % NaCl or Plasmalyte given.

e. Final step to complete the transfusion in the Flowsheet and to close out the transfusion to prevent other transfusionist from accidentally entering documentation on a completed unit.
   i. Inpatient setting: right-click on the flowsheet row of the completed unit and select "Complete Transfuse."
   ii. ED Narrator: Click "Complete Unit" link on right-hand side.

5. **Documentation Overview – 11 Metrics Required in Epic Blood Product Administration Module (BPAM)**
   a. Pre-Vitals – must include all four:
      i. Temperature
      ii. Pulse (and/or Heart Rate)
      iii. Respiration Rate
      iv. Blood Pressure
      Note: Monitoring oxygen saturation is also recommended.
   b. Consent – acknowledge for EVERY unit given.
   c. Component Verification
      i. Dual sign
      ii. Type of blood component
      iii. Donor unit ID number
   d. Date/time initiated.
   e. Intra Vitals (15-minute Vitals) – Must include all four:
      i. Temperature
      ii. Pulse (and/or Heart Rate)
      iii. Respiration Rate
      iv. Blood Pressure
   f. Date/time completed.
   g. Total volume of blood component given.
   h. Post-Vitals – must include all four:
      i. Temperature
      ii. Pulse (and/or Heart Rate)
      iii. Respiration Rate
      iv. Blood Pressure
   i. Answer Y/N for Suspected Transfusion Reaction.

*NOTE: The 11 Metrics required for BPAM Dashboard Transfusion Compliance: Pre-Vitals, Consent, Dual Sign, Component Type, Unit ID Number, Date/Time Initiated, Intra-Vitals, Date/Time Completed, Volume, Post-Vitals, and Suspected Transfusion Reaction Question.

6. **Suspected Transfusion Reaction – MANAGEMENT of Suspected Transfusion Reaction**
   a. If a reaction occurs, it usually manifests within the first 15 minutes of the transfusion. However, transfusion-related adverse events can occur hours to days after the transfusion is complete.

   b. Some common signs and symptoms associated with transfusion reaction include:
      i. Fever (Increase in temperature by 2°F or 1°C from baseline)
      ii. Urticaria (hives)
      iii. Hemoglobinuria (urine turns red or dark brown)

iv. Arthralgia
v. Chills/ rigors
vi. Shortness of breath
vii. Flank pain
viii. Hypotension or hypertension

c. For a full list of transfusion reaction signs and symptoms and recommended actions, refer to the Transfusion Reaction Sign/ Symptoms and Action Chart (Appendix B).

d. If a suspected transfusion reaction occurs during the transfusion:
   i. Stop the transfusion and maintain adequate vascular access. Change the IV set and KVO with a new bag of 0.9% NaCl or Plasmalyte.
   ii. Notify the patient's physician AND the Blood Bank (Blood Bank contact information is listed on bottom portion of the Product Transfusion Record Tag).
   iii. Perform an immediate bedside clerical check reviewing the blood component, patient identification information and medical record for correctness.
      I. If a discrepancy is discovered, notify the Blood Bank immediately.
   iv. Monitor and record post-transfusion vital signs (in Epic or on bottom portion of the Product Transfusion Record Tag).
   v. Take any measure(s) necessary to stabilize/ support the patient throughout the event.
   vi. Obtain sample(s) for transfusion reaction investigation workup. Provide a lavender EDTA tube of at least 3 mL to the Blood Bank and provide a urine sample of at least 4 mL to the Chemistry division.
   For neonates and pediatric patients, two EDTA MAP tubes may be submitted for the blood sample (at least 1 mL total) and a urine sample of at least 0.5 mL will be acceptable.
   vii. Monitor urinary output.
   viii. Document reaction symptoms and actions taken.
      I. Document in Epic BPAM Flowsheet.
      II. Complete bottom portion of the Product Transfusion Record Tag and send to Blood Bank.
   ix. Return the following to the Blood Bank:
      I. Blood component with the patient information label attached (Product Transfusion Record Tag).
      II. Attached blood administration set and any IV solutions connected.
      III. Post-Transfusion sample(s).
      IV. Completed bottom portion of the Product Transfusion Record Tag
      V. Contact the Blood Bank physician if assistance is needed in the evaluation or treatment of the patient.

e. If symptoms of a potential transfusion reaction are recognized after the transfusion is completed, the event should still be reported to the Blood Bank for further investigation.

C. **Downtime – Specimen Collection and Transfusion**

1. Downtime Specimen Collection (Utilize Epic to collect **OR** use the downtime process – DO NOT MIX both processes).
   a. If Epic is unavailable to utilize for blood sample(s) for Blood Bank testing, then the collection must be completed using the downtime process.

b. Samples(s) should be collected in lavender top EDTA tubes(s) and labeled with the patient identifiers matching their attached armband. The accompanying paper order must also be compared to the attached armband and labeled sample to ensure matching name and MRN. Labeling should be completed at bedside immediately following collection.
   i. "UTMB Laboratories Blood Bank Requisition Form" – Downtime/Waiver – Form BB10 is a dual purpose form that can be used as a waiver for Emergency Release of Blood Products, in addition to be used as a downtime order for Blood Bank testing, including specimen collection(s).
   ii. Each department is responsible for ordering and supplying these forms.
   iii. The form contains an area to document patient information, requesting physician, collection information, testing priority, test requested, and adhesive labels that can be used to label the specimen(s). Chart labels can also be utilized.

c. When using the downtime collection process, the patient identifiers on their attached armband must match the patient identifiers on the Downtime Form and Blood Bank labeled sample(s). The patient identifiers on the Downtime Form and Blood Bank label can be handwritten (in pen) or the use of a patient chart label, if available, is preferred.
   i. Patient's full name (first and last)
   ii. Patients MRN

d. Complete collection information must be documented. Can be written on the Downtime Form or on the sample label(s).
   i. Complete date (month/date/year).
   ii. Time (if not using military time, ensure AM or PM is denoted).
   iii. Collector information (can be initials).

e. Recheck for accuracy before sending samples to the Blood Bank.

2. Downtime Transfusion
   a. Every product issued from the Blood Bank will have a Product Transfusion Record Tag attached to the unit.
      i. The top portion of the tag will state in red "DO NOT REMOVE TAG FROM PRODUCT" and is to be used for the verification process and must remain attached to the unit until transfusion is complete.
      ii. The bottom portion of the tag can be used for downtime transfusion documentation and for Suspected Transfusion Reactions.
   b. Utilizing the Product Transfusion Record Tag, the following must be recorded and initialed:
      i. Dual signature verification (BOTH sign, date, and time)
      ii. Start time
      iii. Stop time
      iv. Pre-transfusion vitals
      v. 15-minute vitals
      vi. Post-transfusion vitals
      vii. Volume transfused
      viii. Any signs or symptoms consistent with a possible transfusion reaction.

c. During downtime transfusion workflow, the completed Product Transfusion Record Tag should be placed in the patient's chart to be uploaded into the Electronic Medical Record.

IV. Related UTMB Policies and Procedures

Nursing Policy 7-12-10 Perioperative Autologous Blood Collection and Administration
UTMB Nursing Practice Standards 7-16-20 Administration of Packed Red Blood Cells and Whole Blood to ECMO Patients
Nursing Policy 7-16-8 Storage of Blood for Emergencies with ECMO Patients
UTMB Nursing Practice Standards 7-16-21 Administration of Platelets to ECMO Patients
IHOP - 09.13.24 - Patient Identifiers
IHOP - 09.03.17 - Patient Consent - Overview and Basic Requirements
IHOP - 09.03.18 - Consent for Treatment of a Minor
IHOP – 09.03.35 – Patient-Centered Communication
Pathology Policy 1.02 Specimen Labeling
IHOP – 09.13.47 – Massive Transfusion Protocol – Adult and Obstetric

V. Additional References

Elsevier Performance Manager Skills: Blood Product Administration: Red Blood Cells and Whole Blood – CE
Elsevier Performance Manager Skills: Blood Product Administration (Pediatric)
Elsevier Performance Manager Skills: Blood Product Administration (Neonatal) – CE
Inpatient Transfusion Checklist
Inpatient Frequently Asked Questions
ED Transfusion Checklist
ED Frequently Asked Questions
Blood Bank Dispensing Request
UTMB Guidelines for Transfusion of Blood and Blood Components

VI. Dates Approved or Amended

Originated: 09/17/2014	
Reviewed with Changes	*Reviewed without Changes*
3/18/2015	
01/11/2017	
09/26/2017	
07/07/2020	
06/07/2022	
07/24/2024	
11/26/24	

VII. Contact Information

GAL - Blood Bank	LCC - Blood Bank	ADC – Blood Bank	CLC - Blood Bank
(409) 772-8284	(832) 505-3114	(979) 864-8149	(832) 632-7014

Appendix A

TRANSFUSION SERVICE COMPATIBILITY CHART

Recipient's Blood Type	Packed Red Blood Cells	Plasma**	Pooled Platelets*	Single Donor Platelets*	Cryoprecipitate**
O	O	Any Type	Any Type	Any Type	Any Type
A	A or O	A or AB	Any Type	A or AB preferred, any type	Any Type
B	B or O	B or AB	Any Type	B or AB preferred, any type	Any Type
AB	Any Type	AB	Any Type	AB preferred, any type	Any Type
Rh+	Pos. or Neg.	Pos. or Neg.	Pos. or Neg.	Pos. or Neg.	Pos. or Neg.
Rh-	Negative	Pos. or Neg.	Pos. or Neg.	Pos. or Neg.	Pos. or Neg.

All neonate ≤ 4 mo of age will receive the products indicated below:

Baby's Blood Group	Leukoreduced Irradiated pRBCs	FFP**	Cryoprecipitate** (single units only)	Platelets* (listed in order of preference)
O Pos	O -	AB	AB	any
O Neg	O -	AB	AB	Any Rh-, any
A Pos	O -	AB	AB	A+/- or AB+/-, B+/-, O+/-
A Neg	O -	AB	AB	A- or AB-, B-, O-, A+ or AB+, B+, O+
B Pos	O -	AB	AB	B+/- or AB+/-, A+/-, O+/-
B Neg	O -	AB	AB	B- or AB-, A-, O-, B+, AB+,
AB Pos	O -	AB	AB	AB+/-, B+/-, A+/-, O+/-
AB Neg	O -	AB	AB	AB-, B-, A-, O-, AB+, B+, A+, O+
Unknown	O -	AB	AB	AB-, B-, A-, O-, AB+, B+, A+, O+

*Platelets – Rh negative recipients can receive Rh positive platelets. If the recipient is an Rh negative female of childbearing potential (<55 years of age), the Blood Bank medical director may elect to recommend 1 vial of Rh Immune Globulin.

**Rh is not taken into consideration when transfusing plasma or cryoprecipitate.

Appendix B – Transfusion Reaction Sign/ Symptoms and Action Chart (on next 2 pages)

Acute Transfusion Reactions

Suspected Transfusion Reaction Signs & Symptoms		Immediate Action	Additional actions/Recommendations	Possible Etiology/Cause
Fever > 38°C and ↑ of at least 1°C (2°F) from baseline	Fever with chills or rigors	✓ **STOP** the transfusion ✓ **CHANGE** IV set and start a new infusion of KVO 0.9% NaCl or Plasmalyte ✓ **RECORD** vital signs and continuously monitor and take measures necessary to stabilize/support patient ✓ **NOTIFY** physician and Blood Bank ✓ **MONITOR** urinary output if indicated ✓ **DOCUMENT** reaction symptoms and actions taken ✓ **RETURN** the following to the Blood Bank:*** 1) Blood component with the patient information tag attached 2) Attached blood administration set and any IV solutions connected 3) Post-transfusion samples	**DO NOT RESTART TRANSFUSION** • May give acetaminophen • Consider use of leuko-reduced for future transfusions	**Febrile Non-hemolytic Transfusion Reaction (FNHTR)** • Antibodies to leukocyte antigens (mostly HLA); cytokines
	Fever with chills, rigors, hypotension, shock, nausea, vomiting, headache		**DO NOT RESTART TRANSFUSION** • May give acetaminophen • If bacterial contamination is suspected (≥2°C [3.5°F] increase in temperature from baseline), order blood cultures and urinary analysis and give antibiotics as indicated • Vasopressors if indicated	**Bacterial Contamination** • Most commonly caused by platelets which are stored at room temperature. Contamination can occur during donation.
	Fever with chills, rigors, pain at IV site, nausea, vomiting, flank pain, red or dark brown urine, bleeding, sensation of chest tightness, anxiety. May progress to shock or renal failure.		**DO NOT RESTART TRANSFUSION** • Monitor for urinary output and signs of shock • Observe for signs of Disseminated Intravascular Coagulation • Support medical therapies to reverse the patient's untoward circumstances	**Acute Hemolytic Transfusion Reaction (AHTR)** • Usually due to ABO incompatible blood
Urticaria (Hives) or Rash	Rash, pruritus, hives ONLY *** not indicated for this reaction		**STOP TRANSFUSION – SEE NOTE BELOW** • Administer antihistamines for mild reactions – itching • NOTE: with mild reactions, it <u>may</u> be possible to restart if no other cause or symptoms are found and there is relief of itching after antihistamines.	**Allergic – Mild** • Antibodies to plasma proteins
	Hives, wheezing, laryngeal edema, respiratory distress, hypotension, tachycardia, nausea, vomiting, abdominal pain, circulatory collapse, anaphylaxis		**DO NOT RESTART TRANSFUSION** • Consider epinephrine/corticosteroids for severe anaphylactic reactions • For severe respiratory distress, call Rapid Response/Code • Provide supportive treatment as indicated • Avoid future reactions with pre-medications	**Allergic – Moderate to Severe** • Antibodies to plasma proteins including IgA
Dyspnea, ↓ oxygen saturation	New onset or exacerbations of 3 or more of the following: acute respiratory distress, ↑BNP, ↑CVP, evidence of left heart failure, evidence of positive fluid balance, x-ray evidence of pulmonary edema		**DO NOT RESTART TRANSFUSION** • Administer diuretics • For severe distress, call Rapid Response/Code • Provide supportive treatment as indicated • For subsequent transfusions in patients with cardiac history, reduce rate and consider diuresis prior to or between transfusions • Place patient in semi-Fowler or upright or sitting position to increase venous resistance • Auscultate lung sounds (crackles present)	**Transfusion-Associated Circulatory Overload (TACO)** • Rapid infusion in patients with limited cardiac reserve, renal failure or impaired tolerance to fluids • Can be caused by excessive quantity
	No prior evidence of acute lung injury <u>prior</u> to transfusion. No evidence of circulatory overload. Symptoms include: fever, hypoxia, hypotension, pulmonary edema, normal pulmonary capillary wedge pressure.		**DO NOT RESTART TRANSFUSION** • Auscultate lung sounds (crackles will be absent) • For severe distress, call Rapid Response/Code • Order chest x-ray • Provide other supportive treatment as indicated • If symptoms occur <u>POST</u> transfusion and TRALI is suspected, contact the Blood Bank	**Transfusion-Related Acute Lung Injury (TRALI)** • Donor antibodies reacting to the recipient's white blood cells; or recipient antibodies to donor white blood cells

Adapted from: Hemovigilance Module Surveillance Protocol v2.5.2, AABB Primer for Blood Administration (rev. December 2018), and AABB Circular of Information for the Use of Blood and Blood

Components (rev. October 2017), AABB Technical Manual 19th edition (rev. 2017).

Delayed Transfusion Reactions/Other Associated Reactions

	Suspected Transfusion Reaction Signs & Symptoms	Additional actions/Recommendations	Possible Etiology/Cause
Delayed	Symptoms such as rash, diarrhea, fever, hepatomegaly, liver dysfunction, and a decreased white blood cell count, 2-6 weeks post transfusion	• Physician to notify Blood Bank for follow-up investigation when clinical syndrome is apparent	**Transfusion-associated Graft vs. Host Disease** • Transfused donor lymphocytes become engrafted in tissues and bone marrow of recipient, donor lymphocytes proliferate and destroy patient cells
	Post-transfusion anemia and decreasing benefit from transfusion. Symptoms may also include mild jaundice, fever, and hemoglobinuria (red/brown urine). Typically seen 5-10 days after transfusion.	• Physician should notify Blood Bank for follow-up investigation • Will require additional time to provide antigen-negative compatible RBC products for patient	**Delayed Hemolytic Transfusion Reaction (DHTR)** • Stimulation of antibody development by foreign red cell antigens
	Signs and symptoms of infection typically occur weeks to months after transfusion. Disease/infection may include bacterial, viral, parasitic, or other agents	• Physician should notify Blood Bank for follow-up investigation	**Transfusion Transmitted Infection (TTI)** • Pathogens transmitted by the donor
	New clinically significant antibodies against red blood cells occurring between 24 hours and 28 days after a transfusion. Signs of hemolysis not present.	• Usually detected in the Blood Bank when a new Type and Screen or additional units are requested • Will require additional time to provide antigen negative, compatible RBC components	**Delayed Serological Transfusion Reaction (DSTR)** • Significant antibodies against red blood cells
	Thrombocytopenia. Typically a decrease in the platelet count between 20-80% from pre-transfusion counts occurring 5-12 days following the transfusion of platelets or red cells.	• Alternative explanations for thrombocytopenia are likely but transfusion as a cause should be ruled out • Physician should notify Blood Bank for follow-up investigation	**Post Transfusion Purpura (PTP)** • Alloantibody in the patient directed against HPA or other platelet specific antigen
Other	Tingling in fingers, cramps, hyperactive reflexes, convulsions, laryngeal spasm, respiratory distress	• Infuse slowly if possible but no longer than 4 hours • Consider calcium supplement when multiple units are being transfused • Monitor calcium levels	**Hypocalcemia/Citrate intoxication** • May occur in massively transfused patients or those with liver dysfunction and the inability of the liver to metabolize citrate that may be present in banked blood
	Nausea, diarrhea, muscular weakness, bradycardia, anxiety, cardiac arrest	• Take steps to return potassium to normal levels • Monitor potassium levels • Washed or fresh blood if patient is at risk	**Hyperkalemia** • Electrolyte imbalance usually associated with massively transfused patient or those with renal failure
	Chills, decrease in body temperature, irregular heart rate, cardiac arrest	• Use fluid/blood warmer for patients requiring multiple blood products within a short period of time	**Hypothermia** • Usually a result of the administration of multiple blood products.

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