Policies and Procedures

Title: BLOOD COMPONENTS and BLOOD PRODUCTS – ADMINISTRATION OF

I.D. Number: 1141

Authorization: Former Saskatoon Health Region Nursing Practice Committee

Source: Nursing

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Scope: SHR Acute Care

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DEFINITIONS

ABO Group & Rh Type: A pre-transfusion test to determine the specific ABO group and Rh type of the patient; if requested alone does not include an antibody screen.

ABO/Rh Confirm (ABOC): A second specimen which may be requested by the TML for ABO Group & Rh Type confirmation if a historical blood group is unavailable to allow for ABO group-specific red blood cells to be issued for transfusion. A separate MRP order is not required for draw of the ABOC, if requested by the TML.

Adverse Transfusion Reaction: An undesirable and unintended occurrence during or after the administration of blood components or blood products that is considered to be related to the administration of the component or product. An adverse transfusion reaction is a type of adverse event.

Allogeneic Blood: A human source blood component or blood product collected from volunteer donors and prepared for transfusion to any recipient other than the donor.

Autologous Component: A blood component donated by an individual, exclusively for use by the same individual. Examples include: red blood cells collected intraoperatively via cell salvage, a red blood cell unit collected pre-operatively by Canadian Blood Services for reinfusion to the donor peri-operatively, or stem cell harvest for autologous transplantation.

Blood Components: Parts of blood separated by centrifugation and available for transfusion into a recipient. Examples include: allogeneic or autologous red blood cells, platelets, plasma, cryoprecipitate, and stem cells.

Blood Products (Formerly Known as Plasma Protein Products [PPPs]): Any product manufactured from human plasma. Examples include: albumin, immunoglobulin, and clotting factors.

Code Transfusion – Saskatoon Massive Hemorrhage Protocol (MHP): A defined protocol available for activation by an MRP within Saskatoon hospital sites to ensure the safe and expeditious provision of blood components during a situation of massive bleeding criteria. Activation criteria include ongoing major bleeding with a blood loss of 150 mL/min or more and any of the following: 3 or more units of RBC’s given in 1 hour, shock index (HR/SBP) 1.4 or greater, ABC score 2 or more. For more information refer to: fSHR TML-97: Massive Hemorrhage Protocol (Adult)
Crossmatch: A laboratory test to determine compatibility between donor and recipient blood prior to red blood cell transfusion.

Divided Unit: Blood components divided in smaller volume sizes, which are typically issued for neonatal or small pediatric patient transfusion.

Emergent/Life-threatening Circumstance: A situation in which a delay in treatment with blood components and/or blood products may be detrimental to the patient.

Group & Screen (also known as Type & Screen): Required pre-transfusion tests to determine the patient ABO and Rh type and non ABO antibodies. Antibodies detected may be auto-antibodies formed against the patient’s own cells, or allo-antibodies which formed after exposure to foreign red blood cells from a previous exposure (e.g. previous blood transfusion, pregnancy, and organ transplant). Results must be available before crossmatched red blood cell units can be issued.

Independent Double-Check (IDC): A process whereby each transfusionist administering and checking blood component or product must review the required information and independently confirm the details are correct before blood administration begins.

Incompatible Transfusion: Red blood cell units issued for transfusion to a patient that are ABO compatible, but found to be crossmatch incompatible with donor red blood cells due to non-ABO auto-antibodies (antibodies to self-antigens) in the patient plasma. Crossmatch incompatible red blood cell units will be identified with a neon green sticker, and release will have been authorized by the Transfusion Medicine Physician on-call after all testing protocols have been exhausted and fully compatible red blood cell units cannot be found. For more information, refer to: Crossmatch Incompatible Red Blood Cells.

Massive Transfusion Protocol: see ‘Code Transfusion – Saskatoon Massive Hemorrhage Protocol (MHP)’.

Most Responsible Practitioner (MRP): The physician/practitioner with the overall responsibility for directing and coordinating the care of the patient at the specific point in time.

Priority/Turn-Around-Time (TAT):

- **Priority:** Used on the SHA Transfusion Medicine-Saskatoon Test Request Form to allow for appropriate triage and processing of requests by the TML.

- **Turn-around-time:** Time from a blood specimen being received in the TML until the blood product is available for transfusion.

<table>
<thead>
<tr>
<th>Priority</th>
<th>Approximate TAT</th>
</tr>
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<tbody>
<tr>
<td>Stat</td>
<td>Less Than 1 Hour</td>
</tr>
<tr>
<td>Urgent</td>
<td>Within 4 Hours</td>
</tr>
<tr>
<td>Routine</td>
<td>Within 24 Hours</td>
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</tbody>
</table>

- Stat and Urgent priorities not available in transfusing only sites (rural). Availability for routine transfusions in rural is generally Monday-Friday and TAT can be unpredictable and may take up to 72 hours. Consultation with the on-call Transfusion Medicine Practitioner is available via Systems Flow or by calling RUH Switchboard at 306-655-1000 and asking for the TMP on-call.

- Times listed do not apply to patients with red blood cell antibodies.

Special Requirements: Attributes, or blood component modifications, which transform the blood component from its original state. Examples include: irradiation, washing, and splitting/dividing units. For more information, refer to: LSM-795.
V4: Special Requirements for Blood Products.

Stem Cells (also known as Hematopoietic Progenitor Cells [HPCs]): Capable of providing blood cell and immune system reconstitution after conditioning chemotherapy regimens. Stem cells may be obtained from an autologous or donor source, including cord blood, bone marrow, or peripheral blood via apheresis.

Test and Transfuse Sites: Sites that can perform crossmatch testing as well as transfuse blood components or products. These include: Saskatoon City Hospital (SCH), Royal University Hospital/Jim Pattison Children’s Hospital (RUH/JPCH), St. Paul’s Hospital (SPH), and Humboldt District Hospital (HDH).

Transfusion: Administration of a human source blood component or blood product given by any route (e.g., intravenous (IV), subcutaneous (SC), intramuscular (IM), or topical).

TML: An acronym for Transfusion Medicine Laboratory.

TMP: An acronym for Transfusion Medicine Physician. There is a TMP available and on-call for Transfusion Medicine within the former Saskatoon Health Region 24/7 via RUH Switchboard (306-655-1000).

Transfusion Label/Tag: The documentation attached to the blood component or product that links the intended recipient to the blood component or product. Information on the label/tag shall include: i) recipient’s full name, ii) recipient’s identification number, iii) lot/unique identification number of blood component or product, iv) type/name of blood component or product, v) amount/dose, vi) TSIN (where required).

Transfuse Only Sites: Sites that do not perform crossmatch testing but receive components from Saskatoon hospitals.

Transfusionist: Regulated health professionals authorized to initiate transfusion of a blood components and/or blood products within their respective scope of practice under applicable provincial legislation, regulations, and/or bylaws, and who have successfully completed outlined training that includes transfusion administration, recognition, and management of adverse transfusion reactions.

TSIN (Transfusion Service Identification Number): Used by SHA facilities, excluding sites within the former Saskatoon Health Region at this time. It is a unique and randomly assigned alphanumeric code used to establish a continuous transfusion specific identification link between the patient, their pre transfusion specimen, selected blood components for transfusion, and any required forms.

Uncrossmatched Blood: Red blood cell units issued in an emergent/life threatening circumstance to a recipient before all required pre-transfusion testing steps have been completed (including an antibody screen and/or crossmatch).

Verifier: A second regulated healthcare professional who is trained and authorized to perform the component/product/patient identification checks before transfusion.
1. PURPOSE

1.1 To establish a policy for the safe administration of blood components and blood products to patients within Saskatoon (Royal University Hospital, Jim Pattison Children’s Hospital, St. Paul’s Hospital, and Saskatoon City Hospital) and rural areas of the former Saskatoon Health Region (Humboldt District Health Centre, Lanigan, Watrous, Wadena, Wynyard, and Rosthern health centres) in accordance with applicable blood standards and regulations.

2. POLICY

2.1 Orders/Requests

2.1.1 An MRP order is required to administer blood components and/or blood products. The order shall include:
   - Patient label or a minimum of two identifiers (e.g., full name and Health Services Number (HSN) or Medical Record Number (MRN))
   - Patient location
   - Date the transfusion is to be given
   - Blood component or blood product to be transfused
   - Clinical indicator for transfusion
   - Number of units or dose
   - Rate or duration of infusion
   - Special modifications or requirements (e.g., irradiated, washed, and divided units)
   - Medication orders related to the transfusion, if any (e.g., premedication or diuretic)
   - Any pre/post laboratory tests as required
   - Use of a blood warmer or rapid infusion device as required
   - Sequence in which multiple components or products are to be transfused (e.g., transfuse platelets first, then RBC’s)

   **Note:** A specific MRP and/or TMP order is required to approve transfusion of expired or outdated products or serologically incompatible blood.

2.1.2 Verbal or telephone orders for blood components or product transfusion shall be accepted in emergent/life-threatening circumstances and when consent has been obtained. Verbal or telephone orders must be co-signed by the MRP who gave the order within 24 hours (refer to: fSHR Policy & Procedure #7311 60-004: Ordering of Medications).

2.1.3 A current version requisition shall accompany all requests for pre-transfusion tests, blood components and/or, blood products.

   **Exception:** During CODE TRANSFUSION (MHP activation) TML will require only one product request: Form #103220, at initial activation and will tally products and components on this one form.

2.2 Consent

2.2.1 Refer to: fSHR Policy #7311-50-004: Informed Consent for Blood Components and/or Plasma Protein Products, Including Tissue Graft Transplantation for complete information on consent for blood components and/or blood products.

2.2.2 The patient or person providing consent will be given a copy of the SHR pamphlet Information for Patients about Blood Transfusion and Tissue Transplantation (available on the InfoNet under Transfusion Essentials).

2.3 Administration

2.3.1 Medications used to treat anaphylaxis (epinephrine, antihistamine(s), steroid(s), and albuterol) shall
be immediately available within the patient care area administering the transfusion in accordance with CS-CP-0014 Anaphylaxis - Identification and Initial Treatment - Acute and Continuing Care Settings.

2.3.2 Confirmation of the transfusion order, documentation of patient informed consent, intravenous access for blood infusion (if applicable), that the required supplies are prepared, and that the patient is ready to receive the transfusion shall occur before pick-up of the requested blood component or product.

2.3.3 Simultaneous administration of blood components and/or blood products should be avoided. Separate IV sites or CVC lumens should be used if simultaneous administration of components and/or blood products is required in emergent situations.

*Note:* When ordered by an MRP, 0.9% sodium chloride solution or Plasmalyte may be infused simultaneously with blood components at the most distal Y-site of the administration set.

2.3.4 Medications shall not be added to the blood bag or infused through the same tubing as blood components and/or blood products; alternate IV sites shall be used.

Only in emergent/life-threatening circumstances, or if there has been an adverse transfusion reaction, and after attempt has been made to secure a second IV line without success may the transfusion be stopped; the tubing flushed with a minimum of 10 ml 0.9% sodium chloride (or compatible IV solution) at the most distal port, and a medication administered. The tubing must be flushed again with compatible IV solution after injecting the medication to prevent mixing of the blood product and medication. The transfusion may then be resumed.

*Note:* Caution should be used when simultaneously administering medications linked to hypersensitivity reactions via another IV line or CVC lumen since distinction between medication-related symptoms and transfusion reactions may be difficult.

2.3.5 Transfusion of blood components and/or blood products shall be initiated as soon as the component and/or product is available in the patient care area. The blood component or product shall be returned to the TML if it cannot be initiated within 60 minutes from the time of issue as identified by the time documented on the transfusion tag.

2.3.6 All blood component infusion must be completed within 4 hours from the documented time of TML component issue or modification as documented on the transfusion tag. Infusion of blood products must be completed within 4 hours of accessing (spiking) the vial.

2.3.6.1 If 4 hours has elapsed and the transfusion is not complete, the transfusion must be discontinued and the remaining product discarded. The MRP shall be notified by the transfusionist if transfusion is not completed.

*Note:* If for any reason a component unit or product vial is not transfused and is wasted, return the component or product to TML, who will update the patient’s file.

2.3.6.2 If a patient is unable to tolerate an entire unit over the 4 hour period, then an MRP may order a divided unit to be administered following approval by the on-call Transfusion Medicine Physician.

2.3.7 Blood components shall be administered through a standard, non-vented blood administration set (170–260-micron filter).

*Note:* Gravity infusion sets may be appropriate in the setting of a massively bleeding patient.

2.3.8 Blood products shall be administered as per the administration monographs available from the TML Product...
2.3.9 Blood administration sets shall be primed with a compatible solution.

2.3.9.1 For blood component administration, prime the administration sets with 0.9% Sodium Chloride or Plasma expander such as Plasmalyte.

*Exception*: Neonates/Pediatrics less than 20kg - Prime blood administration set with the blood component.

2.3.9.2 For blood products, prime the appropriate tubing with compatible solution as identified by the administration monograph available from Transfusion Medicine Product Catalogue (see Appendix A) or the manufacturer’s product monograph.

*Exception*: Neonates/Pediatrics less than 20kg - Prime administration set with the blood product.

Changing of Administration sets occurs:
- After 4 consecutive units have been transfused (Note: 1 bag of platelets or pooled bag of cryoprecipitate is equivalent to 1 unit for transfusion), or
- After 4 hours of use, or
- If more than 60 minutes has elapsed between transfusions, or
- If the filter/administration set becomes occluded, or
- Upon completion of blood products.

*Note*: Some blood products do not require a blood administration set for infusion (refer to Appendix A). Change Primary IV sets as per Regional Nursing Policy & Procedure: FSHR Policy #1118: Intravenous and/or Peripheral Saline Lock Insertion & Maintenance

2.3.10 Separate administration sets shall be used for each different blood component(s) or blood product(s) infused.

2.3.11 The TML copy of the transfusion tag /label shall remain attached or on the blood component or blood product for the duration of the transfusion.

2.3.12 If any blood component or blood product is removed from its original bag or vial into a syringe, then a syringe label or second side of transfusion tag shall be used to label the syringe.

2.3.13 Patients should remain on the clinical care area during administration of all blood components and/or blood products to ensure appropriate monitoring. If an emergent/urgent diagnostic or interventional investigation/procedure is required, the patient shall be accompanied by staff that is qualified as a transfusionist. Reasons shall be documented in the chart when/if it is not feasible for the patient to remain within their clinical care area during transfusion.

2.4 Visual Inspection

2.4.1 All blood components and/or blood products shall be visually inspected by the transfusionist prior to accessing the blood component and/or blood product with the administration set. If the following is observed, or if the container is not intact, do not access the blood product and notify the TML:
- Clots
- Clumps
- Discolouration
- Particulate matter
- Foreign objects

*Note*: For more information refer to the CBS Visual Assessment Guide.
2.4.2 Blood components or blood products shall be returned to the TML immediately if a decision is made to not transfuse.

2.4.3 The MRP must be notified immediately in any case where an unexpected delay arises in blood component or product transfusion. For example, if a blood component fails visual inspection and a replacement product is not immediately available from the TML.

2.5 Pressure Infusion Device

2.5.1 An MRP’s order is required to use a pressure infusion device with transfusion

2.5.2 Use of a pressure infusion device to increase the rate of a gravity flow infusion shall not exceed 300 mmHg.

*Note:* Pressures exceeding 300 mmHg may result in leakage or rupture of bag seams.

2.6 Blood Warming Device

2.6.1 An MRP’s order is required to use a blood warming device with transfusion

2.6.2 When using a blood warmer, follow manufacturer’s instructions for use (refer to Appendix G).

*Note:* Pressure infusion devices may be used with warming devices when ordered.

2.7 Coolers (For Use within a Saskatoon Hospital)

2.7.1 Validated coolers should only be utilized for issue of refrigerated blood components or products in Saskatoon Hospitals within the operating room or critical care environments.

2.7.2 Coolers are sealed upon issue from the TML and should only be opened at the time when the transfusionist is prepared to administer the transfusion.

2.7.3 Blood components issued in a cooler must be used within the validated time frame of the cooler. The cooler expiry date and time will be indicted on the cooler label. Blood coolers must be returned to the TML within the validated time frame and repacked if blood components are still required by the clinical care area.

2.7.4 Once opened, a blood component or blood product that is not transfused must be returned to the TML as soon as possible and within 60 minutes of issue.

*Note:* MHP coolers are not sealed and do not contain cooling packs; therefore, unused component(s) must be returned to the TML as soon as possible and within 60 minutes of issue.

2.8 Transport Containers (For Transport of Blood between Hospital Sites)

2.8.1 In rare circumstances, professional patient transport services may take validated transport containers with specific components or products along with the patient. The transport container will be sealed upon issue and should only be opened at the time component is to be transfused by a qualified transfusionist.

2.8.1.1 Transport containers are valid for 24 hours from time of issue; however, once opened, any component(s) that are in the transport container must be initiated within 4 hours or returned to the TML as soon as possible.

2.8.1.2 The transport container will be labelled with important information regarding the safe transport and handling of the blood component or blood product contained therein.
2.8.2 All transport containers should be delivered to the local TML upon arrival at the receiving site if patient is stable and does not require urgent transfusion.

2.8.3 The TML at the receiving site is responsible for documenting the final disposition of all blood components, and must be notified of all blood components that accompany the patient, and their disposition (transfused or wasted).

2.9 Infection Control

2.9.1 Appropriate personal protective equipment shall be worn when administering blood components and/or blood products and when disposing of components and/or products. Ensure proper hand hygiene is followed (see SHA-02-005 Hand Hygiene) and ensure aseptic technique is always adhered to.

2.9.2 Upon completion of the transfusion, empty blood component bags, filters and administration sets shall be placed in biomedical waste. Glass blood product vials and spike from tubing will be disposed of in a sharps waste container.

2.9.2.1 Any partially transfused blood components or blood products can be returned to the TML for discard, or may be discarded in a biohazard bin.

2.10 Monitoring

2.10.1 The patient vital signs (temperature, pulse, respiratory rate, blood pressure, SpO2 with O2 source) shall be monitored and documented for transfusion of all components and blood products accordingly (except IVIG; see 2.10.2):

- Pre-transfusion - within 30 minutes prior to initiating the transfusion
- 15 minutes after commencing and every one hour until completion
- Upon completion of the transfusion
- Whenever a suspected adverse transfusion event is suspected
- More frequently as indicated by the clinical situation or ordering MRP

2.10.2 IVIG vital sign monitoring and documentation shall occur:

- Within 30 minutes prior to starting infusion
- 15 minutes after starting
- 30 minutes after any rate change
- 30 minutes after introduction of new lot number
- Every hour until completion
- More frequently as indicated by the clinical situation or ordering MRP
- Whenever a suspected adverse transfusion event is suspected

*Note: Refer to provincial clinical procedure for IVIG when available*

2.10.3 Vital signs shall be recorded on the ‘Transfusion/Infusion Administration and Assessment Record’ (Form #101059) or as indicated on the ‘Transfusion Administration Record for Operating Room/Massive Transfusion Protocol’ (Form #103945), see Appendix D.

2.11 Transfusion Adverse Reactions – Refer to Appendix Band C

2.11.1 The patient shall be observed for signs and symptoms of an adverse transfusion reaction during transfusion, and ideally for a minimum of 30 minutes and up to 6 hours following the transfusion. When direct monitoring for 6 hours after transfusion is not feasible (e.g. patients receiving care in outpatient areas and/or those being discharged following transfusion), the patient or responsible caregiver shall be given the LSM-901: Heading Home After a Transfusion patient handout by the transfusionist (found on the “Transfusion Essentials” page under “Pathology and Laboratory Medicine”).
2.11.2 The MRP shall be notified immediately upon suspecting an adverse transfusion reaction and management orders shall be obtained. The TMP on-call may also be called for adverse transfusion reaction management at (306) 655-1000 and ask for the TMP on-call.

2.11.3 All transfusion adverse events whether minor, moderate or severe must be reported to the TML first by phone then by completing the Saskatchewan Transfusion Adverse Event Report - Form #103695 (see Appendix E), even when the transfusion reaction is managed and the transfusion is continued without further symptoms. Fax completed form to 306-655-2222.

2.12 Patient Notification

The patient shall receive written notification when a blood component and/or product has been administered. The transfusionist will complete the form, ‘Notification of Administration of Blood and/or Blood Products’ (Form #103854) and provide it to the patient or caregiver. Only one form is required per course of treatment or admission stay regardless of type or number of components/products administered (see Appendix F).

3. PROCEDURE

3.1 Pre-transfusion

3.1.1 Verify and review that a valid informed consent is on the patient chart.

3.1.2 Review MRP orders to ensure completeness (refer to Section 2.1). If incomplete, contact the MRP to clarify the transfusion order.

3.1.3 Verify that the appropriate pre-transfusion testing has been completed. Refer to Appendix A to confirm the pre-transfusion testing relevant to the ordered blood component or product to be transfused, and if needed contact the TML for patient specific information.

3.1.3.1 A Group & Screen must be performed:
• Every 96 hours when administering red blood cells
• Once per hospital stay when administering platelets and plasma
• Infants less than four months old - once during initial hospital admission (unless maternal antibodies are present then per direction from TML)

Exception: With MRP approval, in emergent/life-threatening circumstances, uncrossmatched blood may be issued before completion of compatibility testing.

3.1.3.2 A Group and Screen may or may not be required for certain blood products – check Appendix A and if needed, contact the TML if questions or concerns.

3.1.3.3 An ABO/Rh confirm (ABOC) sample may be requested by the TML for ABO Group & Rh Type confirmation if a historical blood group is unavailable, to safely allow for ABO group-specific red blood cells to be issued for transfusion.

3.1.4 Complete the appropriate test request form and identify the appropriate priority:

3.1.4.1 Testing and Transfusing sites: TML Test Request - Form #101058

3.1.4.2 Transfusing only sites: Referral Request for Transfusion Medicine Testing/RBC Crossmatch - version October 2, 2019 (click on link and download document)
3.1.5 Confirm patient identification. A two-person patient identification process must be completed in the physical presence of the patient before collection of a pre-transfusion sample.

3.1.5.1 The person who collects the patient’s sample verifies the patient’s identity. Compare the patient’s full name, date of birth and unique identification number (Health Service Number) on the identification band with the corresponding information on the requisition. Patient information must agree. The collector signs the requisition and records date and time collected on requisition.

3.1.5.2 The person who confirms the identity of the patient must be different from the person who collects the sample. If able to communicate, the patient may self-identify; otherwise, a second person (e.g., Family member, friend, healthcare provider) may identify the patient. The patient or second person identifier must be able to state at least the patient’s full name (first and last name) and date of birth. Patient information must agree. The collector must obtain the signature of the identifier at the bedside immediately prior to collection.

3.1.6 Send the form (as identified in 3.1.4) and sample to the TML.

**Note:** Rejection criteria include, but are not limited to:
- Incomplete form (e.g., including missing signatures)
- Unlabeled/mislabeled forms or specimens.

3.1.7 Provide teaching and/or information to the patient, parent, legal guardian, or substitute health care decision maker regarding the transfusion:
- Explain the purpose of the transfusion and monitoring required
- Instruct the patient to remain on the clinical care area during the transfusion
- Instruct the patient, parent, legal guardian, or substitute health care decision maker to notify nursing staff if any of the following develop during or after the transfusion procedure:

<table>
<thead>
<tr>
<th>Pain</th>
<th>Nausea or vomiting</th>
<th>Chills or rigors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortness of breath (dyspnea)</td>
<td>Hives (urticaria), rash, or itchiness</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Sweating (diaphoresis)</td>
<td>Dizziness or weakness</td>
<td>Fever or cold sensation</td>
</tr>
<tr>
<td>Bleeding</td>
<td>Palpitations or tachycardia</td>
<td>Any change in condition</td>
</tr>
</tbody>
</table>

3.1.8 Complete and submit a requisition to complete the order for a blood component or blood product from the TML:

<table>
<thead>
<tr>
<th>Blood Component/Product</th>
<th>Form Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBCs in Test and Transfuse sites; Platelets and plasma for all sites</td>
<td>Blood Component and Tissue Product Request (Form #103220)</td>
</tr>
<tr>
<td>RBCs in Transfuse Only Sites</td>
<td>RBC Crossmatch/Antibody Investigation Referral Requisition (version October 2, 2019)</td>
</tr>
<tr>
<td>Test request and RBCs required can be on one form; see 3.1.4)</td>
<td>Blood Product Request (Form #103221)</td>
</tr>
</tbody>
</table>

**Note:** Blood components or blood products cannot be issued from the TML unless a properly completed request form with patient identifiers is submitted to the TML. The TML will notify staff when the component or product is ready to be issued.
3.1.9 Choose an appropriate vascular access device based on patient condition and transfusion needs. The blood component or product administration rate must be specified by the MRP, and appropriate for the clinical condition of the patient.

3.1.9.1 Short peripheral catheters: use 20-24 gauge based on vein size and patient preference. When rapid transfusion is required, a larger-sized catheter gauge is recommended (14-18 gauges),

3.1.9.2 Central venous access devices (including PICC): acceptable for transfusions; recognize that with centrally inserted catheters, infusion speeds may be faster if required/ordered than with peripheral inserted IV catheters

3.1.9.3 Neonatal/pediatric patients: umbilical venous catheters or small saphenous vein catheters (24 gauge) are commonly used in infants and/or pediatric patients’ pre-transfusion vital signs within 30 minutes prior to initiating the transfusion. The MRP must be notified if the patient is febrile or has any other concerning or unexpected findings before proceeding with the transfusion. Document accordingly.

3.1.10 Prime the blood administration set with 0.9% sodium chloride or Plasmalyte unless transfusing a blood product, then refer to the administration monograph or the Manufacturer’s Monograph for compatible IV fluid and appropriate administration set (refer to Appendix A). Clamp the tubing once the line is primed. If the blood administration set is used, the filter should be completely wet. Fluid levels must always remain above the filter. Always refer to manufacturer’s guidelines to ensure proper product usage.

Exception: Neonates/Pediatrics less than 20kg – Prime administration set with the blood component or blood product.

3.1.11 Administer pre-transfusion medication as ordered by the MRP.

3.1.12 Connect the blood administration set directly to the IV hub or to a luer lock extension tubing. If extension is added, the volume must not exceed 2 ml.

3.1.13 Complete the ‘Blood Component and Product Pickup Slip’ (Form #102930) to be provided to the TML.

- RUH/JPCH: Page the blood porter. The blood porter will write the following on the slip:
  - Patient’s full name
  - HSN or MRN
  - Type and amount of component/product to be issued
- When blood porter is not available, unit staff will take the completed slip to the TML
- RUH OR: Phone TML with request; place completed component or Product Request Form in OR pass through.
- SPH, SCH, HDH and Transfuse only sites: Unit staff will take the completed slip to the TML.

Note: Blood components or blood products must not be delivered to the patient care unit and left without the acknowledgement of the transfusing staff at the patient location.

3.1.14 For pneumatic tube delivery:

- Complete the current version: ‘Blood Component and Product Pickup Slip’ (Form #102930)
- Complete the patient information and HSN or unique numerical identifier
- Complete the contact information for tube transport: first and last name (print), phone number you can be reached at and the tube station number
- Complete the component or product requested with amount/volume or dose

Note: Only red blood cells, platelets, plasma, cryoprecipitate and WinRho can be delivered by pneumatic tube. DO NOT return any blood components or products back to TML using the pneumatic tube system.
3.1.15  Print a copy of ‘Transfusion/Infusion Administration and Assessment Record’ (Form #101059) or the ‘Transfusion Administration Record for Operating Room/Massive Transfusion Protocol’ (Form #103945) in preparation for the transfusion and confirm that the correct patient identifiers appear in the top right-hand corner of the transfusion administration record and the transfusion tag by initialing Box A and Box B.

3.1.16  Once the blood component or product is received, complete a visual inspection as per 2.4.

3.1.17  In the physical presence of the patient and immediately before initiating transfusion of a blood component and/or blood product, two qualified regulated health-care professionals shall independently verify the patient’s identity using two unique identifiers and complete patient and blood component/product checks. This process is completed in the physical presence of the patient and is known as “the independent double check” (IDC).

3.1.17.1  The bedside IDC is led by the qualified transfusionist who is responsible for initiating the transfusion and the verifier is a second regulated health-care professional who is trained and authorized to perform this task. Exception: in the case of a patient on isolation the verifier may complete the IDC outside the isolation room.

3.1.17.2  The bedside IDC shall include the following verifications:
- Compare the transfusion tag with the MRP order – patient’s full name with correct spelling, health service number, blood component/product including amount or dose, and special requirements
- Compare the transfusion tag with the Transfusion Medicine chart report – patient ABO and Rh group (if applicable)
- Compare the transfusion tag with the blood component or product to be transfused – unit number, donor ABO and Rh group (if applicable), lot number and volume (if applicable)
- Product expiration will not occur during the time of transfusion
- Presence of the correct patient identifiers on the printed transfusion administration record form.

Note: See FSHR Policy 7311-60-017 Verification of Identification

Note: If the above criteria are not met, do not initiate the transfusion and notify the TML.

3.1.18  Document the following on the transfusion record or tag:
- Signature of the transfusionist and the second transfusionist participating with the identification and verification of correct patient and component/product. Initials are not acceptable. Checks must be completed independently.
- Date of transfusion
- Start time of transfusion

3.1.19  Affix the chart copy of the transfusion tag to the ‘Transfusion/Infusion Administration and Assessment Record’ (Form #101059) or the ‘Transfusion Administration Record for Operating Room/Massive Transfusion Protocol’ (Form #103945). Verify and document on the form that all the required checks are completed.

3.1.20  Leave the remaining portion of the transfusion tag attached to the blood component or product for the duration of the transfusion.
3.2 Administration

3.2.1 Initiate the transfusion. Refer to Appendix A for links to specific products.

3.2.2 Assess vital signs and monitor for adverse events. Refer to 2.10 and 2.11.

3.3 Adverse Transfusion Reaction – Refer to Appendix B and C

3.3.1 When an adverse transfusion reaction has been identified and is suspected:

3.3.1.1 Stop the transfusion/infusion immediately (don’t discard the blood component or product - it may be needed for testing).

3.3.1.2 Maintain IV patency. Ensure no further blood component/product is infused, and IV access maintained by infusing 0.9% sodium chloride or compatible IV solutions using new IV tubing.

*Note:* Disconnect the blood infusion set from the patient but do not remove from patient’s bedside until further direction is received from MRP as to whether the blood component/product is to be restarted or discontinued.

3.3.1.3 Obtain vital signs (this will need to be done every 15 minutes until the patient is stable).

3.3.1.4 Re-check patient ID band and blood component or product label.

3.3.1.5 Notify the MRP and/or TMP immediately and obtain orders for patient management.

3.3.1.5.1 If the transfusion has been discontinued, obtain orders for investigation of transfusion adverse reaction:

3.3.1.5.1.1 Saskatoon/Humboldt use test request form: [TML Test Request (Form #101058)](#)

3.3.1.5.1.2 Transfuse-only sites (Rosthern, Wadena, Wynyard, Lanigan, Watrous) use test request form: [Crossmatch/Antibody Investigation Referral Request Form](#) (version October 2, 2019).

3.3.1.6 Notify the TML and complete the [Saskatchewan Transfusion Adverse Event Report (Form #103695)](#) with any recognized transfusion reaction (whether or not transfusion has been continued or discontinued).

<table>
<thead>
<tr>
<th>Site</th>
<th>TML Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUH</td>
<td>306-655-2179</td>
</tr>
<tr>
<td>SCH</td>
<td>306-655-8204</td>
</tr>
<tr>
<td>SPH</td>
<td>306-655-5168</td>
</tr>
<tr>
<td>HDH</td>
<td>306-682-8128</td>
</tr>
<tr>
<td>Transfusion only sites</td>
<td>Local TML</td>
</tr>
</tbody>
</table>

3.4 Post Administration

3.4.1 Following the transfusion, and in the absence of an adverse transfusion reaction, flush the administration set with compatible solution to clear remaining blood component or blood product. Disconnect the administration set from the patient.
3.4.2 Document the time of transfusion completion on the transfusion slip and ‘Transfusion/Infusion Administration and Assessment Record’ (Form #101059) or the ‘Transfusion Administration Record for Operating Room/Massive Transfusion Protocol’ (Form #103945).

3.4.2.1 IV administration: document the time when the lines are clear of the blood component or product

3.4.2.2 Subcutaneous or intramuscular administration: document the time when the injection is administered

3.4.3 Assess post-transfusion vital signs.

3.4.3.1 IV administration: as soon as possible after the transfusion is complete (see 3.4.2.1).

3.4.3.2 Subcutaneous or intramuscular administration: 15 minutes after the injection is administered

3.4.4 Discard the administration set and blood component or blood product container as per 2.9.2.

3.4.5 Monitor inpatients for signs and symptoms of a delayed transfusion adverse event for a minimum of 6 hours. If the patient is being discharged 30 minutes post-transfusion (e.g. Outpatient units), provide education to the patient and/or caregiver on signs and symptoms of an adverse transfusion reaction along with the handout, Heading Home After A Transfusion. If patient experiences any signs or symptoms of a reaction, they should seek further medical attention.

3.4.6 Complete the ‘Notification of Administration of Blood and/or Blood Products’ (Form #103854) and give to the patient (refer to 2.12).

3.5 Documentation

3.5.1 Ensure the following is documented on the transfusion tag:
- Signature of the transfusionist and the second transfusionist participating in the independent double check of correct patient and product. Initials are not acceptable.
- Date of transfusion
- Start and stop time of the transfusion

3.5.2 Document the following on the ‘Transfusion/Infusion Administration and Assessment Record’ (Form #101059) or ‘Transfusion Administration Record for Operating Room/Massive Transfusion Protocol’ (Form #103945), or where applicable if not on this form:
- Valid MRP order present
- Valid patient consent present
- Patient education complete
- Patient identification performed at bedside - includes confirmation of the correct patient identifiers on the transfusion administration record form
- Initial Box A and Box B to confirm the patient identity on the transfusion tag/slip is the same as on the transfusion record label on the top right side of the form
- Visual inspection performed
- Product/Lot number and compatibility checks performed
- Expiry date and time checked
- Infusion rates
- Vital signs
- Any adverse event and actions taken
- Total volume infused
- ‘Notification of Administration of Blood and/or Blood Products’ (Form #103854)
- Use of pressure infusion device and amount of pressure
- Use of blood warmer and temperature during administration
4. REFERENCES


11. Saskatoon Health Region Department of Pathology and Laboratory Medicine: Tests and services catalogue [Internet]. Saskatoon SK: c2023 Saskatchewan Health Authority. [cited 2022 Jul 25]. Available from: https://www.saskatoonhealthregion.ca/locations_services/Services/Pathology-Laboratory-Med/healthpractitioners/Pages/Home.aspx


### APPENDIX A
Blood Component and Blood Product Administration Guidelines:

**Red Blood Cells (RBC)**
- Plasma
- Plasma – Solvent Detergent
- Platelets
- Cryoprecipitate

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Generic Name</th>
<th>Electronic Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adynovate</td>
<td>Factor 8 (VIII), recombinant, extended half-life</td>
<td>ADYNOVATE</td>
</tr>
<tr>
<td>Albumin, 25%</td>
<td>Albumin, human</td>
<td>Albumin 25%</td>
</tr>
<tr>
<td>Albumin, 5%</td>
<td>Albumin, human</td>
<td>Albumin 5%</td>
</tr>
<tr>
<td>Alprolix</td>
<td>Factor 9 (IX), recombinant, extended half-life</td>
<td>ALPROLIX</td>
</tr>
<tr>
<td>Antithrombin III</td>
<td>Antithrombin III (ATIII)</td>
<td>Antithrombin III</td>
</tr>
<tr>
<td>Benefix</td>
<td>Factor 9 (IX), recombinant</td>
<td>BenefIX</td>
</tr>
<tr>
<td>Berinert</td>
<td>C1 Esterase Inhibitor</td>
<td>Berinert</td>
</tr>
<tr>
<td>Beriplex</td>
<td>Prothrombin Complex Concentrate</td>
<td>Prothrombin Complex Concentrate</td>
</tr>
<tr>
<td>Corifact</td>
<td>Factor 13 (XIII), plasma derived</td>
<td>Corifact</td>
</tr>
<tr>
<td>Cytogam</td>
<td>CMV Immune Globulin (CMV)</td>
<td>CMV Immune Globulin (CMV)</td>
</tr>
<tr>
<td>Enerix B</td>
<td>Hepatitis B Vaccine</td>
<td>Hepatitis B Vaccine</td>
</tr>
<tr>
<td>Feiba</td>
<td>Anti-Inhibitor Coagulation Complex</td>
<td>FEIBA NF</td>
</tr>
<tr>
<td>Fibrtyga</td>
<td>Fibrinogen Concentrate</td>
<td>Fibrtyga</td>
</tr>
<tr>
<td>Haemlibra</td>
<td>Factor 8-Mimic, Bispecific Antibody</td>
<td>HAEMLIBRA</td>
</tr>
<tr>
<td>HepaGam B, HyperHEP B S/D</td>
<td>Hepatitis B Immune Globulin (HBIG)</td>
<td>Hepatitis B Immune Globulin</td>
</tr>
<tr>
<td>Humate P</td>
<td>Von Willebrand Factor/Factor 8 (VIII), plasma derived</td>
<td>Humate P</td>
</tr>
<tr>
<td>HYPERTET</td>
<td>Tetanus Immune Globulin</td>
<td>Tetanus Immune Globulin</td>
</tr>
<tr>
<td>Immuneine</td>
<td>Factor 9 (IX), plasma derived</td>
<td>ImmuneineVH</td>
</tr>
<tr>
<td>KamRAB Rabies Immunoglobulin</td>
<td>Rabies Immune Globulin</td>
<td>Rabies Immune Globulin</td>
</tr>
<tr>
<td>Intravenous Immunoglobulin</td>
<td>Immune Globulin IVIG</td>
<td>Intravenous Immunoglobulin Solvent Detergent Treated, 5%</td>
</tr>
<tr>
<td>Intravenous Immunoglobulin</td>
<td>Immune Globulin IVIG</td>
<td>Intravenous Immunoglobulin, 10%</td>
</tr>
<tr>
<td>Kovaltry</td>
<td>Factor 8 (VIII), recombinant</td>
<td>KOVALTRY</td>
</tr>
<tr>
<td>Niastase RT</td>
<td>Factor 7a (VIIa), recombinant</td>
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</tr>
<tr>
<td>Nuwiq</td>
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<td>Octaplex</td>
<td>Prothrombin Complex Concentrate</td>
<td>Prothrombin Complex Concentrate</td>
</tr>
<tr>
<td>RabAvert</td>
<td>Rabies Vaccine</td>
<td>Rabies Vaccine</td>
</tr>
<tr>
<td>Rebinyn</td>
<td>Factor 9 (IX), recombinant, extended half life</td>
<td>REBINYN</td>
</tr>
<tr>
<td>RiaSTAP</td>
<td>Fibrinogen Concentrate</td>
<td>RiaSTAP</td>
</tr>
<tr>
<td>Subcutaneous Immunoglobulin</td>
<td>Immune Globulin SCIG</td>
<td>Subcutaneous Immunoglobulin</td>
</tr>
<tr>
<td>Surgiflo</td>
<td>Thrombin Sealant</td>
<td>Surgiflo</td>
</tr>
<tr>
<td>Tisseel</td>
<td>Fibrin Sealant</td>
<td>Tisseel</td>
</tr>
<tr>
<td>Tretten</td>
<td>Factor 13 (XIII), recombinant</td>
<td>Tretten</td>
</tr>
<tr>
<td>VariZIG</td>
<td>Varicella Zoster Immune Globulin</td>
<td>Varicella Zoster Immune Globulin</td>
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<tr>
<td>Vistaseal</td>
<td>Fibrin Sealant</td>
<td>Vistaseal</td>
</tr>
<tr>
<td>Wilate</td>
<td>Von Willebrand Factor / Factor 8 (VIII), plasma derived</td>
<td>Wilate</td>
</tr>
<tr>
<td>WinRho</td>
<td>Rh Immune Globulin (RhiG)</td>
<td>Rh Immune Globulin</td>
</tr>
<tr>
<td>Xyntha</td>
<td>Factor 8 (VIII), recombinant</td>
<td>Xyntha</td>
</tr>
</tbody>
</table>
Please see the Product Catalogue on Saskatoon Health Region website for more information on the above listed components and/or Blood Products, or for information on Blood Products not included within this appendix.

**NOTE:** Only red blood cells, platelets, plasma, cryoprecipitate and WinRho can be delivered by pneumatic tube. *DO NOT return any blood components or products back to TML using the pneumatic tube system.*

**NOTE:** In the event of a computer downtime, TML can fax a controlled copy of the component monograph. You must provide a fax number to TML upon request. *DO NOT ask for the component or product until after you have received the requested faxed monograph.*

**APPENDIX B**
Transfusion Reaction Chart

**APPENDIX C**
Bedside Transfusion Reaction Algorithm

**APPENDIX D**
Transfusion/Infusion Administration Record

**APPENDIX E**
Saskatchewan Transfusion Adverse Event Report Form
## APPENDIX F

### TRANSFUSION CHECKLIST

Based on Bloody Easy Blood Administration Version 3, ORBCoN pages 80-89

**NOTE:** Unequivocal (unmistakable) identification of the patient is mandatory.

Patient MUST be wearing a patient identification armband. Patient identification information (on blood tag/syringe label) MUST remain attached to the blood or blood product for the duration of the transfusion.

### PRE-TRANSFUSION
- **INFORMED CONSENT**
  - Written (signed) consent obtained
  - Exception: emergency life-threatening bleeding

- **TRANSFUSION ORDER**
  - Indication supported: signs, symptoms
  - Complete, required information included

- **GROUP & SCREEN TESTING**
  - Required for compatible blood components, confirm valid group and screen is valid within time limits defined by TML
  - Order new group and screen/crossmatch if patients and screen has expired
  - Label specimen tube at patient's bedside

- **PREPARE THE PATIENT**
  - Verify patient ID band is in place
  - Educate: symptoms indicative of reaction
  - Preform pre-transfusion patient assessment:
    - Transfusion history, cardiovascular assessment for TACO, risk factors, pre-existing symptoms (e.g., fever, rash, shortness of breath, lower back pain)
    - Baseline vitals sign
    - Dedicated, patient IV (peripheral or central)

- **PREPARE THE EQUIPMENT**
  - Compatible IV fluid (ONLY 0.9% NaCl [sodium chloride] or PlasmaLyte for blood components)
  - Blood components: tubing/filter (270-260 micron); change after 4 units or 4 hours
  - Platelets: always use NEW/FRESH tubing/filter
  - Prime tubing/filter with blood or compatible IV fluid
  - IV setup to stop erythrocytes & maintain TIVD; 0.9% NaCl flush syringes + any fluid IV line or 0.9% NaCl IV line
  - Infusion devices: if Health Canada approved (e.g., smart pumps)

### PICK UP BLOOD FROM TML (Transfusion Medicine Lab)
- A pick-up slip with patient identification (surname, first name, unique identification number) is required by TML

### TRANSFUSION CHECKLIST

- **BEDSIDE PRE-TRANSFUSION CHECK**
  - Blood received matches transfusion order
  - At bedside, in the physical presence of the patient
  - Independent double check MUST include:
    1. **Patient Identification:** surname, first name, unique identification number located on armband, order, transfusion unit, tag 
    2. **ABO, RhD Blood Groups (only for components):** identical/compatible on group & screen test, Canadian Blood Services (CBS) blood bag label, and transfusion tag
  - **Unit (Components) / Lot (Product) Number:** identical on CBS tag label / (Components) / manufacturer label (Products), transfusion tag
  - **Visual Inspection & Expire:**
    - Components: no clots, usual color, ports intact, expires 4 hours after issue from TML
    - Products: packaging/seal intact, color as per manufacturer, viability/glass bottles - once entered/spiked, expires after 4 hours

### PATIENT ASSESSMENT AND VITAL SIGNS
- Close monitoring/observation required including:
  - Temp, BP, pulse, respiratory rate, oxygen saturation; TACO risk factors
  - Minimums: before starting transfusion (30 minutes or less), 30 minutes after starting, every hour during transfusion, upon completion

### INFUSION RATE (for each unit or dose)
- **COMPONENTS:** 5ml/hour for first 15 minutes (defibr if severely bleeding), then as ordered
- **PRODUCTS:** see LSN for product specific details
- **Re-check after 15 minutes, if no indication of reaction then increase rate as ordered

### MONITOR FOR POSSIBLE TRANSFUSION REACTION
- If any adverse/unexpected/sudden symptoms, STOP transfusion; refer to Blood Administration Policy #1141 or contact the Transfusion Medicine Physician (TML) on call for direction

### POST-TRANSFUSION

- **COMPLETING THE TRANSFUSION**
  - Comply with expiry time specific for blood components/blood products. If outside the expiry time, discard maintain in biohazardous waste
  - Flush IV tubing
    - Components: flush with 0.9% NaCl
    - Products: flush with compatible IV fluid
  - Dispose of all blood tubing/bags in biohazardous waste
  - Re-assess patient and re-check vital signs:
    - At end of transfusion
    - Periodically post-transfusion (reactions may occur 4-6 hours post-transfusion, dyspnea reactions - up to 24 hours post-transfusion)
  - Outpatients: provide patient with information about what to do if they experience any signs or symptoms of an adverse event. **Healing Home After A Transfusion** job aide is available.

### DOCUMENTATION
- Ensure the transfusion administration record is complete:
  - Both transfusionists sign on record
  - Start date and time; completion date and time
  - Initials of transfusionists, hanging blood present in both Box A and Box B of the checklist
  - Required vital signs and patient assessments
  - Record transfusion rates and volume transfused
  - If a suspected adverse event occurred, complete the SK Transfusion Adverse Event Form (TAEF) I and send to TML, contact the MRP and TML/TMP for further directions.
APPENDIX G

BLOOD WARMING DEVICES

Purpose: Rapid infusions of large volumes of cold blood may decrease the temperature of the sinoatrial node causing arrhythmias. Use of blood warmers may decrease the incidence of arrhythmias and cardiac arrest associated with infusion of large volumes of cold blood components (Red Blood Cells and Plasma). Use of blood warmers may also decrease the development of rigors in persons with cold agglutinin disease. This piece of equipment is usually seen in the operating room, intensive care unit, or emergency department. In general, routine warming of blood is not recommended and rarely indicated for patients receiving routine transfusion.

Contact the TMP for consultation before using in routine transfusion.

Indications:
- Multiple, rapid infusions of cold blood components
- Cold agglutinin disease
- Exchange transfusions in infants
  - Prior to use of any blood warming device, please review the Operator’s Manual of the device. Staff should undergo appropriate training per core unit policy prior to use.

Procedure for use of the Ranger® Fluid Warming device:
*Ensure aseptic technique is maintained and hand hygiene is performed at the required moments.*

1. Obtain a warming device and cassette.
2. Slide the empty, flat warming cassette into the slot in the warming unit. **Do not prime the warming cassette before sliding it into the warming unit.**
3. Prime a blood administration set with 0.9% sodium chloride or Plasmalyte. Clamp the tubing.
4. Attach IV extension tubing to the distal end of the warming set (red port).
5. Open the clamp on the blood administration set and prime the tubing of the warming unit & IV extension tubing.
   - a) Invert the bubble trap until it is full
   - b) Turn the bubble trap right side up and prime the line going to the patient
   - c) Place the bubble trap into the holder on the warming unit.
6. Attach the blood administration set to the proximal end of the warming set (blue port – inlet line).
7. Close all clamps on the warming set and blood administration set.
8. Turn the warming unit on. When the temperature display reads 41°C the unit is ready for use (takes approximately two minutes to warm up).
9. Attach the tubing to the patient, open all clamps, and begin transfusion as per standard procedure.
10. Upon completion of the transfusion close all clamps prior to disconnecting the tubing from the patient &/or warming unit.

*Note: If at any time the over-temperature alarm sounds (temperature above 42°C) stop the transfusion. If the temperature does not drop below 42°C within a few minutes discontinue use of the warming device.*

*Malfunction of a blood warmer is a Medical Device Incident and must be reported as a Safety Alert.*

The malfunctioning device must be taken to Clinical Engineering. Obtain a new warming device from the OR, if appropriate.