PRE-TRANSFUSION

1. Consent
   - Informed consent is required for all plasma based blood products.
   - Informed consent is not required for Recombinant Factor Concentrates because these products do not contain human plasma and are not classified as blood products.
   - Informed consent need not be obtained:
     - when urgent treatment is necessary to preserve a patient’s life and continuing health, and
     - when it is not reasonably possible to obtain consent, and
     - when there is no substitute decision maker
   - Physicians and Nurse Practitioners with blood prescribing privileges may obtain consent for blood products.
   - Registered Midwives may obtain consent for Rhesus Immune Globulin only (WinRhö).  
   - Obligation for obtaining consent rests with the physician, Nurse Practitioner or Registered Midwife responsible for the patient.
   - The prescriber must complete, unless this is not reasonably possible to do so, a Refusal to Consent to Blood and Blood Products form if the patient refuses to consent to transfusion.
   - Prior to initiating a transfusion the transfusionist will verify that consent has been obtained.
   - The transfusion shall be withheld and the prescriber notified if consent cannot be verified.
   - Consent for transfusion will be applicable for the duration of a hospital stay, or in the case of ongoing treatment, applicable for the course of the treatment.
   - For an oncology patient, a course of treatment is defined as the total course of therapy from induction to completion of treatment.
   - For patients with prolonged transfusion needs it is recommended that consent be obtained annually.

2. Prescriber Order
   - An order is required for all blood products.
   - Blood products shall be prescribed by a health care provider with blood prescribing privileges only.
   - The transfusion order shall specify:
     - patient’s first & second name, date of birth and medical record unit number
     - clinical indication for transfusion
     - sequence in which multiple products are to be transfused
     - specific blood product required
     - number of units or volume in mLs required
     - date of the transfusion
     - rate of infusion or duration of infusion
     - any modification or special transfusion requirements e.g. irradiation, washing or Anti-CMV negative
     - the use of a blood warmer or rapid infusion device
     - medication orders related to the transfusion

3. Blood Product Request Forms
   - A Group & Screen / Crossmatch Request form is required for RBC’s.
   - Request forms shall contain patient first and last name, Date of Birth and Medical Record Number and be completed in full.

4. Patient Identification
   - An identification (ID) band must be worn by all patients requiring / undergoing:
     - group and screen, cross-match or blood group only sample collection
• a blood product transfusion e.g. red blood cells
• administration of a blood product e.g. RhIG (WinRho®) or factor concentrate

Exception:
• If a patient is unable to wear an ID band, clear documentation must be present in the chart indicating deviation from policy and describing alternative identification process used.
• Patient identity shall be verified at all steps in the transfusion process including, but not limited to:
  • prior to collection of group and screen, cross-match or blood group only patient blood sample
  • prior to initiation of a transfusion or administration of all blood products

5. Intravenous Access
• Blood products may be administered through a peripheral vascular access or central vascular access line.
• The gauge of the access line should be based on the clinical status of the patient and urgency of the transfusion.
• Refer to Intravenous Access for Administration of Blood Products table in administration procedure.
  • For rapid infusion of large volumes of RBC’s a large bore lumen is required.
  • A large gauge lumen is preferred for RBC transfusion to allow appropriate flow rates and avoid cell damage.
  • Administration through small gauge lumen and/or long extension tubing restricts flow rate.
  • Rapid infusion through a small lumen and/or long extension tubing increases the risk of hemolysis.

5.1 Dedicated Line
• A dedicated line is required for all blood product transfusions.
• “Piggy backing” or the use of secondary ports is not permitted.

5.2 Administration Sets
Volumetric Method:
• Blood components; red cells, platelets, plasma and cryoprecipitate shall be transfused through a blood administration set with 170-260 micron filter.
• IVIg and RhIg shall be transfused through a straight administration set.
• Albumin shall be administered through a vented administration set.
• The blood administration set with 170-260 micron filter must be changed:
  • after administrating 2 units, or
  • every 4 hours
  • prior to the transfusion of platelets, or
  • if the set becomes occluded

Exception: follow manufacturer’s guidelines for rapid infuser administration set.

Syringe Method:
• The extension tubing must be changed:
  • After administering 2 syringe aliquots, or
  • Every 4 hours
  • When switching from one blood product to another

Note: Blood products that are issued in a syringe are pre-filtered and do not require a filtering at the time of administration.

5.3 Add on devices
• The routine use of add-on devices is discouraged because they add points of connection that could loosen or separate totally leading to possible contamination, air embolus or bleeding. Stopcocks, extension sets, y-connectors and needleless connectors are examples of add-on devices.

6.0 Compatible Fluids
• Blood components; RBC’s, platelets, plasma, and cryoprecipitate are compatible with 0.9% Normal Saline and Plasma-Lyte only.
• D5W and dextrose solutions will cause clumping and hemolysis
  Solutions containing calcium may cause clotting due to calcium content.
• IVIG is compatible with D5W.
• Albumin is compatible with 0.9% Normal Saline and D5W.
• RhoIG is compatible with 0.9% Normal Saline only.
• Fractionated products e.g. Factor Concentrates are compatible with 0.9% Normal Saline only, unless otherwise stated.

7.0 Priming Administration Sets
• The administration set shall be primed prior to initiation of the transfusion.
• Suitable solutions for priming lines
  0.9% Normal Saline and Plasma-Lyte only for RBC’s, platelets, plasma, and cryoprecipitate.
  0.9% Normal Saline for RhoIG
  D5W for IVIG
  0.9% Normal Saline or D5W for Albumin
  the blood product
• If the blood product is used to prime the lines, then
  the lines must not be primed until the pre transfusion checks are complete, AND
  the blood product must not be removed from the patient bedside to prime the lines

8.0 Rescue Line
• A rescue line shall be available when transfusing blood products.
  The rescue line may be Y connected to the blood administration set (BCCH), OR
  The blood product line can be connected to the normal saline rescue line at the port distal from the patient (BCW), OR
  A separate line available at the patient’s bedside
• Suitable solutions for rescue lines
  0.9% Normal Saline for RBC’s, platelets, plasma, cryoprecipitate, albumin and RhoIG
  D5W for IVIG

9.0 Pre-Transfusion Patient Assessment
• A pre-transfusion patient assessment shall be performed to identify any clinical manifestations that:
  may be cause for delaying the transfusion e.g. fever
  may be confused with a transfusion reaction e.g. fever or pre-existing rash
  may predispose the patient to a transfusion reaction
• The pre-transfusion patient assessment shall include:
  measurement of baseline vital signs
  O₂ saturation level, chest auscultation, and a review of fluid balance for patients who are considered high risk e.g. patients with coexisting medical conditions such as renal failure or cardiovascular disease
  The pre-transfusion patient assessment shall be performed within 30 minutes of commencing the transfusion and PRIOR to spiking the blood product bag/bottle.

10 Pre Medications
• The pre medication shall be administered prior to the planned transfusion to ensure maximum effectiveness.

11 Transport of Blood Product within BCCH and BCWH
• A Blood Release Request Form is required for the issue of all blood products from TML.
• The Blood Release Request Form shall contain patient first and last name, Date of Birth and Medical Record Number and be completed in full.
• Do not send the completed Blood Release Request Form to TML until TML phone to state the blood product is ready for collection.
The blood product shall be delivered promptly to the patient location and directly to a responsible staff member.

**Transport of Blood Product TO another site with patient during patient transfer**
- Contact TML.
- TML will prepare and pack the required Blood Product for transport.

⚠️ *Never* send a Blood Product with a patient transfer if the Blood Product has not been packed for transport by TML.

**Transport of Blood Product FROM another site with patient during patient transfer**

⚠️ *DO NOT* transfuse any Blood Products that arrive with a patient transferred from another site.
- Contact TML.
- Deliver the Blood Product with all accompanying documentation to TML ASAP.

**12 Time Frames**
- The transfusion shall be initiated within 20 minutes of issue from TML or removal from temperature controlled storage.
- Blood products shall be returned immediately to TML if there are any delays in initiating the transfusion.
- RBC’s, platelets, plasma, cryoprecipitate, and IVIG shall be infused within **4 hours of issue** from TML.
- Albumin shall be infused within **4 hours of spiking** the bottle.
- Blood products i.e. RBC’s, platelets, plasma, cryoprecipitate, and IVIG that are out of temperature controlled storage for 30 minutes or greater cannot be returned to inventory and must be discarded.

**13 Storage and Handling**
- Blood products shall be stored in monitored temperature controlled storage.
- Blood products shall be issued one unit at a time, unless the patient’s clinical status requires the issue of multiple units.
- Blood products shall not be stored in unapproved fridges such as ward or medication fridges.
- Platelets are **never** stored in a fridge.
- Blood products shall not be warmed in hot water or in a microwave oven.

**14 Equipment**
- Only Health Canada and Children’s & Women's Hospital approved infusion pumps, rapid infusion devices, blood warmers and cell savers shall be used for transfusion.
- All infusion pumps / equipment shall be:
  - Maintained and inspected by Biomedical Engineering
  - Safe to use with intravenous access gauge and type
  - Appropriate for method of administration e.g. volumetric or syringe

**14.1 Blood Warmers**
- Blood warmers may be used to prevent hypothermia that can be induced by rapid infusion of large volumes of refrigerated blood.
  - Indicated for use:
    - Large volume rapid transfusions
    - Exchange transfusions
  - A prescriber’s order is required except in clinical areas where there is an established policy and the patient’s clinical status requires the use of a blood warmer.
  - The blood warmer must have a temperature alarm system.
  - Blood warming devices shall not raise the temperature of blood to levels greater than 42°C due to the risk of hemolysis.
• Blood warmers can be used to infuse:
  • Red Blood Cells
  • Plasma
• Blood warmers should not be used to infuse:
  • Platelets
  • Cryoprecipitate
• The manufacturer instructions shall be adhered to at all times.

14.2 Rapid infusion Device
• Rapid infusion devices and external pressure devices may be used to assist the infusion of large volume of red blood cells in massive bleeding situations.
• A prescriber’s order is required except in clinical areas where there is an established policy and the patient’s clinical status requires the use of the specific infusion device.
• The manufacturer instructions shall be adhered to at all times.

15. Visual Inspection
• The integrity of the blood product shall be checked prior to administration.
• Blood products that appear abnormal shall not be transfused without further investigation.

16. Pre-Transfusion Check
• Immediately prior to the transfusion or administration of the blood product the transfusionist shall complete a pre-transfusion check.
• The pre-transfusion check shall be completed by two health care providers, with required competencies, one of whom must then initiate the transfusion.
• When possible, involve the patient / caregiver in the identification process by asking them to state their / their child’s full name and date of birth.
• The final pre transfusion check shall be performed in the presence of the patient.
• The transfusionist shall confirm and document that all identifying information linking the patient and the blood product matches. This includes the:
  • patient's ID band
  • transfusion record
  • product tag
  • label on blood product
• The transfusion shall not be initiated until the pre-transfusion check is complete and all discrepancies are resolved.
• The pre-transfusion check shall be documented by signing the transfusion record.
• The transfusion shall be initiated immediately after the pre-transfusion check has been completed.
• If the blood product is removed from the patient’s bedside or there is a delay in commencing the transfusion, the checking procedure shall be repeated.
• The product tag shall remain attached to the product for the duration of the transfusion.

TRANSFUSION

17. Transfusion Flow Rates
• The rate of the infusion should be specified by the prescriber or as per relevant procedure.
• The recommended infusion rates shall not be exceeded.
• The recommended infusion rate may be exceeded in emergency situations.
Exception:
• The maximum infusion rate for albumin 25% shall not be exceeded.
• The maximum rate for IVIg shall not be exceeded.
• The rate of the infusions should be sufficient “to keep the vein open”. If the rate of the planned transfusion is lower than the rate required “to keep the vein open” normal saline, or D5W for IVIg, may be co-infused (using Y connector) to ensure that the total volume required is maintained.
18. Medication

- Medication shall not be added directly to the blood product or to the administration set containing the blood product.

**Exception:**
- Co-administration of morphine or hydromorphone with red blood cells can be considered as a last resort for optimal pain management. If approved by a physician, co-infusion of morphine or hydromorphone in 0.9% Normal Saline Y-connected with a blood product is acceptable. The morphine or hydromorphone infusion line should be connected to the port most proximal to the patient and distal from the blood product. A Y-connector with back check valves must be used to prevent backflow.
- Furosemide may be added to Albumin for hemodialysis patients only.

19. Patient Monitoring

- The patient shall be observed during the transfusion and for an appropriate time after the transfusion for signs and symptoms of a transfusion reaction.
- The transfusionist shall remain with, or be in a position to closely observe, the patient for the first 15 minutes following the start of each unit (when product actually reaches the patient) and observe for signs and symptoms of a transfusion reaction.
- Patient observation should be increased for high risk patient’s e.g. clinically unstable or unconscious patients.
- O₂ saturation level & fluid balance should be monitored in patients who are at risk of fluid overload.
- Patients should remain in the clinical area at all times. Patients who must leave the clinical area during the transfusion shall be accompanied by an RN.

**Measure and document vital signs:**

- **For neonatal patients (less than 4 months of age):**
  - Within 30 minutes before the of start of the transfusion
  - 15 minutes after the start of the transfusion
  - 30 minutes after the start of the transfusion
  - 60 minutes after the start of the transfusion
  - Hourly for remainder of the transfusion
  - Within 60 minutes of completion of the transfusion
- **For pediatric and adult patients**
  - Within 30 minutes before the of start of the transfusion
  - 15 minutes after the start of the transfusion
  - 60 minutes after the start of the transfusion
  - Hourly for remainder of the transfusion
  - Within 60 minutes of completion of the transfusion

**Vital Signs** include:
- Heart Rate
- Blood pressure
- Temperature
- Respiration rate, and
- For neonatal patients include O₂ Saturation level

20. Documentation

The Transfusion Record:
- is used to document the transfusion event
- shall be retained in the patient chart
- is used to ensure full traceability of the blood product
The Product Tag:
- shall remain attached to the blood product for the duration of the transfusion
- is completed at the end of the transfusion
- shall be returned to Transfusion Medicine Laboratory on completion of the transfusion
- is used to ensure full traceability of the blood product

Additional information recorded in the patient’s chart:
- vital signs
- volume infused
- any transfusion reaction experienced by the patient
- any interventions related to the transfusion event

21. Traceability
- The completed transfusion record shall be retained in the patient medical record.
- The completed product tag shall be returned to Transfusion Medicine Laboratory on completion of the transfusion.

POST TRANSFUSION

23. Post Transfusion Care
- Vital signs shall be measured within 60 minutes of termination of transfusion.
- Patients should receive instruction on post transfusion care and signs and symptoms of delayed transfusion reactions.
- Patients who are discharged following a transfusion should receive the “Heading Home After a Transfusion Form”.
- Patients who are discharged following a transfusion shall be discharged when clinically stable.

24. Recipient Notification Tag
- The patient / caregiver shall receive notification of transfusion in the form of the “Recipient Notification Tag”.

Exception:
- The recipient notification tag will be blank if the patient receives a recombinant Factor Concentrate because these products are not plasma based (do not contain blood).

TRANSFUSION REACTIONS

25. Management of Transfusion Reactions
- The transfusion shall be stopped if the patient exhibits any signs or symptoms of a transfusion reaction.
- All suspected transfusion reactions shall be reported to Transfusion Medicine Laboratory using the Transfusion Reaction Report Form 00055606.

REFERENCES


