Guideline 11

Special Considerations for Pediatric Blood Administration

11.1 Purpose

Best practice guidelines are established for nurses in order to align with the standards set forth by the American Association of Blood Banks (AABB), Accreditation Canada (AC), Transfusion Services, Canadian Standards Association (CSA), and the Canadian Society of Transfusion Medicine (CTSM) for safe administration of blood, blood products, and/or blood components to the pediatric and neonatal population.

11.2 Policy

Each facility shall have policies in place to address transfusions in the pediatric/neonatal population and ensure patients and/or family members are adequately educated on the potential risks, benefits, and appropriate alternatives.

Policies shall be in place addressing the administration of blood, blood products, and/or blood components, including the use of appropriate infusion device(s) for the pediatric/neonatal population.

Policies shall be in place to identify, evaluate and report any adverse events related to the transfusion related to the pediatric/neonatal patient.

11.3 Documentation

Please refer to Guideline 6 for additional information on documentation.

All documentation must take place on the Cumulative Blood Product Record (CBPR).

Important: (CBPR) is a *mandatory* regional health form for facility staff to complete when blood, blood components, and blood products are being transfused in an inpatient or an outpatient setting. This form must become part of the permanent patient health record and retained in the facility.

- Before administration of any blood, blood product, and/or blood components, the following MUST be documented on the CBPR:
  - Pre-transfusion vital signs
  - Names and designations of the two authorized providers doing the checks
  - Patient education
  - Consent (√ if yes)
  - Type of blood, blood component, or blood product being infused
  - Lot number or donation number of the product
- Subsequent documentation on the CBPR includes:
  - Vital signs 15 minutes after the initiation of the transfusion and at minimum every hour for the duration of the transfusion
  - Volume transfused

- Return ROT (√ if yes)
- Suspected transfusion reaction (√ if yes)

11.4 Materials

Materials:

- Appropriate blood administration sets
  - Standard blood transfusion tubing (170-260 micron filter)
  - A standard vented IV tubing should be used for administration of product in glass bottles such as albumin and IVIG.
  - Administration sets or filter needles that accompany blood products should be used for administration of that product. If a blood product does not have accompanied tubing refer to product monograph.
- Patent IV (Pediatrics: 22-25 recommended)
- Compatible IV solution
  - 0.9% sodium chloride (normal saline) for blood
  - 5% Dextrose in water (D5W) for IVIG
  - Refer to individual product monograph for compatible IV solutions for blood products
- Vital signs machine
- Thermometer
- Infusion pump
- CBPR
- Transfusion reaction package (i.e. emergency supplies/anaphylaxis kit)
- New 0.9% sodium chloride bag and standard tubing must be readily available

11.5 Quality Control

A facility-based quality improvement system or process should be in place to monitor compliance to the administration of blood, blood products, and/or blood components, through random patient and health care record audits and/or other quality improvement mechanisms. Health Care Facilities/Service Delivery Organizations should implement a quality improvement system facilitated through the Transfusion Practice Committee to monitor compliance.

A competency program shall be established for all personnel involved in the transfusion. Efficacy of this competency program shall be assessed annually or as needed.

11.6 Procedure

Action	Key Points
Pre-Transfusion: Informed Consent: • Ensure documentation is signed and in patient's chart.	**Refer to Guideline 1 for further direction on consent.** **Infants/children under 16 yrs of age** • **Parents/caregivers are decision makers and give informed consent.** **Adolescents (greater or equal to 16yrs of age) with decision making capability should give informed consent themselves.**
Transfusion Orders Ensure there is an appropriate order to transfuse that includes the correct: • First and last name, and unique identifier for the recipient • Product name and volume/dosage required • Date and time for transfusion to take place • Rate or duration of the infusion • Modification/special requirements to blood or blood components, if any • Sequence of administration, if multiple blood products are ordered • Pre/post transfusion medication orders related to the transfusion	***Red Blood Cells:*** **Pediatric: 10-20ml per kg body weight infused over 2-4 hours** **Neonate: 10-20ml per kg body weight** ***Pooled Platelets LR CDP, Apheresis Platelets:*** **Neonate (up to 6 weeks corrected) or less than 10kg body weight (or if fluid volume is a concern):** • **10ml per kg/dose infused over 1hr (recommended)** **Pediatric or greater than 10 kg body weight:** • **10ml/kg infused over 1 (recommended) to 1.5 hours dependent on vein/line size** ***Pooled Platelets Psoralen Treated:*** **Children and neonates:** • **up to 10ml/kg of pooled platelets psoralen treated** **Recipients greater than 15kg:** • **up to one adult dose**
Pre-transfusion testing Ensure there is a valid Transfusion Medicine Results Report (TMRR) in the patient's chart.	**Neonates <4 months**: Plasma antibody is not performed as baby is not making ABO antibodies. • Antibody screen represents the maternal antibody status rather than the neonate antibody status. • If mother has a clinically significant red cell antibody, the neonate must be transfused with red cells that lack the antigen to which the antibody is directed. A full crossmatch is performed until the antibody disappears from the neonate's circulation. • Type and screen sample is valid until the baby reaches 4 months of age (during same

	admission, regardless of the number of transfusions they have received).
Venous Access Ensure patient has adequate venous access for transfusion: • Pediatrics: 22-25 gauge	**Must be large enough to allow adequate flow rate and avoid cell damage.**
Assemble Equipment (see Guideline 8)	**Administer blood through a standard blood transfusion set with a 170-260 micron filter to remove gross fibrin clots and aggregates.**
Patient and Family Education Ensure patient and/or parent/guardian understands the of type of blood product, risks and benefits, potential adverse reactions, purpose of transfusion, alternative treatments, and the right to refuse.	
Patient Identification See Guideline 3 for more details.	
Inspection of Blood/Blood Component See Guideline 4 for more details.	
Baseline Patient Assessment Complete a systems assessment to assess for any pre-existing symptoms the patient may have that could be mistaken for transfusion reaction (example: fever, rash, pain, etc). Baseline vital signs must be completed within 30 minutes prior to initiating transfusion.	
Initiation of Transfusion • Ensure patency of venous access • Prime blood administration set with RBCs or product • Connect to venous access *For the first 15 minutes of the transfusion:* • Transfuse slowly (1ml/kg/hr, up to 50ml/hr). • Transfusionist to stay at the patient's bedside to monitor for any signs or symptoms of reaction • Complete set of vital signs after the initial 15 minutes of transfusion	**If giving multiple units you must stay with the patient for the first 15 minutes of each subsequent unit.**

• If tolerated, the usual administration rate is 5ml/kg/hr up to 150ml/hr. Infants/Neonates: RBCs may be issued in bags or syringes and are administered by infusion pump.	
Monitoring during transfusion • Monitor closely as most patients may not be able to verbalize symptoms. • Close attention should be paid to IV site (especially with neonates) to avoid an interstitial IV.	
Post Transfusion Monitoring Pediatric or >10kg body weight: • Flush access device with 10-20ml of 0.9% saline post transfusion. Neonate (up to 6 weeks corrected) or less than 10kg body weight or if fluid volume is a concern: • Flush access device with 1-5ml of 0.9% saline upon completion of transfusion. Refer to Guideline 8 for further directions.	**You must flush the IV line with 20ml of NS between each unit.**

Remember:

Blood Administration Set Changes:

- Every 4 hours
- After 4 units PRBC
- Between different products
- More than 30 minutes have elapsed between units
- Set is occluded

11.7 Notes/Special Considerations

- Irradiated red cell units are recommended for fetuses undergoing intrauterine transfusion.
- Washed red cells may be recommended for neonatal exchange transfusion.
- Do not use pooled platelets psoralen treated for neonatal patients treated with phototherapy devices that emit a peak energy wavelength less than 425nm or have a lower bound of the emission bandwidth.
- Excess phlebotomy can lead to iatrogenic blood loss.
- Please review and refer to the appropriate product monograph prior to administration.
- Platelets can be administered through a standard IV pump but they are **NOT** to be used with a rapid infuser or pressure device.

Indications:

The following are suggested transfusion thresholds for pre-term infants with anemia:

Postnatal Age	Hgb with respiratory support*	Hgb with no respiratory support*
0-7 days	115 g/L	100g/L
8-14 days	100 g/L	85 g/L
>14 days	85 g/L	75 g/L

*Respiratory support is defined as an inspired oxygen requirement in excess of 25% or the need for mechanical increase in airway pressure

Indications for Red Cell Transfusion-Neonates:

- Acute blood loss of >10% blood volume
- Hemoglobin less than 80 g/L in a stable newborn with symptoms of anemia
- Hemoglobin less than 120 g/L in an infant with respiratory distress syndrome of congenital heart disease

Indication for Red Cell Transfusion-Pediatrics:

- Acute blood loss of >15% blood volume
- Hemoglobin <70 g/L with symptoms of anemia
- Significant preoperative anemia when other corrective therapy is not available
- Hemoglobin <130 g/L on extracorporeal membrane oxygenation
- Chronic transfusion programs for disorders of red blood cell production

Hemoglobin Levels-Birth to Adolescence

Newborn	3 months	6 months-2yrs	6-12yrs	12-18yrs
~165g/L	~115g/L	~125g/L	~135g/L	F: ~140g/L M ~145g/L

Hemoglobin Levels for Pre-Term Infants

Age	1.0-1.5 kg	1.5-2.0 kg
2 weeks	163 g/L	148 g/L
1 month	109 g/L	115 g/L
2 months	88 g/L	94 g/L
3 months	98 g/L	102 g/L