**Other Names**
- Packed cells, red cells

**Consent Required**
- Yes

**Pre-Transfusion Sample**
- ☐ Not Required
- ☐ Blood Group
- ☐ Group & Screen
- ☑ Crossmatch

Sample expires every 3 days (i.e. @2359 on third day following date of collection).

**Neonates (infants under 4 months):**
- A group and screen is valid for the current hospital stay up to 4 months of age unless there are clinically significant maternal antibodies.
- Neonates do NOT need a repeat crossmatch unless there are clinically significant maternal antibodies.
- In extreme emergencies, O-negative blood may be issued to neonates without a Group and Screen.

**Approval Requirements**
- Hematopathologist approval required in the following circumstances:
  - Hematology / Oncology patient with hemoglobin ≥ 100g/L
  - All other patients with hemoglobin ≥ 70g/L
  - Transport Team requests

**Product Description**

**Packed Red Blood Cells**
- Whole blood centrifuged to remove plasma and filtered through a leukocyte reduction filter. Hematocrit 0.50–0.70 L/L.
- Volume 293 ± 26 mL. SAGM (saline, adenine, glucose, and mannitol) additive solution is added to red cells to increase storage time to 42 days.

**Notes:**
- Must be ABO compatible.
- Irradiated red cells may be required in certain circumstances. Refer to Irradiation of Blood Components in ePOPS.
- CMV negative red cells are indicated for Intrauterine Transfusion only.

**Washed Red Blood Cells**
Red cells washed with 0.9% Normal Saline normal saline to remove plasma. Most of the plasma is removed; unit contains ≥75% of red blood cells from original unit after washing.
- Units expire within 24 hours of preparation.
- For:
  - patients with a history of severe or repeated reactions and who are unresponsive to pre-medication, or
  - SOME patients with IgA deficiency and anti IgA antibodies
  - Hematopathologist approval required for first time requests.

**Divided / split units / aliquots**
- Units can be divided into smaller volumes, aliquots, using a sterile docking device.
- Divided units, are used for:
  - Neonates/infants to reduce donor exposure by the use of a dedicated donor unit for multiple transfusions as the volume required for each transfusion is small*
  - patients who require slower infusion rates, i.e. patients at risk of volume overload
  - situations where it is not feasible to transfuse the full volume in a four-hour time frame, i.e. transfusion volumes greater than 15mL/kg

⚠️ Management of transfusions for transfusion-dependent/frequently transfused
neonates/infants requires close collaboration between the clinical team and TML.
- Divided units should be requested for:
  - neonates/infants
  - transfusion volumes greater than 15mL/kg
  - patients at risk of volume overload
- **Contact** TLM to request a divided unit.
- **Inform** TLM if a dedicated unit is anticipated for a patient.
  - for volumes less than 50 mL, a syringe aliquot is used
  - for volumes greater than 50 mL, a mini bag aliquot is used

### Clinical Indications

- Increase oxygen carrying capacity in patients with symptomatic anemia, or to maintain adequate tissue oxygenation in bleeding or critically ill patients.
- Hemoglobin less than 70 g/L and symptomatic
- Hemoglobin between 70 and 90 g/L and
  - signs and symptoms of impaired oxygen delivery, or
  - active bleeding, or
  - clinical need for higher hemoglobin level
- Rapid blood loss with hemodynamic instability
- Hemoglobin concentration greater than 90 g/L – RBC transfusion is usually inappropriate.

### Contraindications

- Pharmacologically treatable anemia (e.g. iron supplement, EPO)
- Hypovolemia without significant sign or symptoms of anemia

### Risks

Febrile Non-Hemolytic transfusion reaction, allergic reactions, transfusion associated circulatory overload (TACO), transfusion related acute lung injury (TRALI), bacterial contamination, hemolytic reactions, alloimmunization, anaphylaxis, graft vs. host disease, hyperkalemia, iron overload, post transfusion purpura and transmission of infection.

### Dosage

**⚠️ If the patient is actively bleeding these guidelines may need to be exceeded.**

**Adult/ Pediatric**
- In general, a dose of 10 to 15 mL/kg can be expected to raise the hemoglobin concentration by about 20 to 30 g/L.
- For non-bleeding patients, best practice is to transfuse one red blood cell unit at a time with reassessment after each unit, rather than multiple units.
- For children greater than 25 kg use adult dosing.

**Neonate:**
- Recommended dose is 10 to 15 mL/kg. Maximum dose is 20 mL/kg
- The upper end of the range, 20 mL/kg, applies to:
  - severe anemia,
  - expected ongoing risk factors, or
  - concurrent bleeding

### Administration

Refer to blood administration procedures.

**Volumetric Method** for volumes greater than 50 mL
- a blood administration set, with 170-200 micron filter, is required

**Syringe Method** for volumes less than 50 mL
- the product is pre-filtered, no filter required at time of administration
**Warming Permitted** | Yes. Refer to manufacturer manual at all times.
---|---
**Compatible Solution** | 0.9% Normal Saline and Plasma Lyte only. **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. A Y-connector with back check valves must be used to prevent backflow.
**Infusion Rates** | **Infuse** each unit of red cells at 1mL/kg/h, up to a maximum of 50 mL/h (when product reaches the patient), for the first 15 minutes.
- **Adjust** the flow to the prescribed infusion rate listed below, if there are no signs or symptoms of a transfusion reaction during the first 15 minutes.
- **Infuse** at 2 – 5 mL/kg/h, for remainder of transfusion, to a maximum rate of:
  - 150 mL/h for Neonatal and Paediatric patients
  - 200 mL/h for Adult patients
  - These rates may be exceeded in emergency situations
**Monitoring** | Refer to Administration of Blood Products procedure.
**Storage Conditions** | Stored in a monitored blood product storage refrigerator at 1 – 6 ºC.
- Return red cell unit and Transfusion Record to Transfusion Medicine within 20 minutes from time of issue if there are any delays in administration.
- **Do NOT** refrigerate Red Blood Cells in a medication fridge or store on nursing unit.

**References**


Standards for Hospital Transfusion Services (Ver. 4.0). (2017). Ottawa, ON. Canadian Society for Transfusion Medicine.


Developed By
Transfusion Medicine – Transfusion Safety Nurse Clinician

Version History

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