11 FRESH BLOOD COMPONENTS

11.1 RED BLOOD CELLS (RBC) AND PAEDIATRIC RBC

RED BLOOD CELLS (RBC)

DESCRIPTION

Typical unit content:
- Volume 260mL ± 19
- Hct adjusted to 0.59 ± 0.3
- Hb g/unit 50 ± 6
- Haemolysis % at expiry 0.37 ± 0.25
- Universally Leucocyte Depleted (leucocyte count $10^6$/unit 0.27± 0.07)

PAEDIATRIC RBC

DESCRIPTION

Packed RBC’s, but provided in sets of 4 units from one single donor for neonatal transfusion. Typical unit content:
- Volume 61 mL ± 5
- Hct adjusted to 0.63 ± 0.03
- Hb g/unit >40
- Haemolysis % at expiry 0.20 ± 0.13
- Universally Leucocyte Depleted (leucocyte count $10^6$/unit initial unit <1)

These units are normally Group O, CMV negative and leucoreduced. The primary aim of these products is to reduce the number of donor exposures.
- 35-day expiry
- >21 days left to expiry at time allocated to a patient.
- Volume 50-100mL, Hct 0.50-0.75, haemolysis at expiry <0.8%.

INDICATIONS FOR RBC

Treatment of symptomatic anaemia where there is insufficient time to treat with specific medications such as iron, vitamin B12, folic acid or recombinant erythropoietin.
Replacement of significant traumatic or surgical blood loss.
**STORAGE**

Red cells may be stored up to 35 days at 2-6°C with appropriate additive. They must be stored in a designated, monitored, blood fridge. Do not store in ward fridge.

**ORDERING**

In-date Group & Hold (G&H) sample required for compatibility testing. ABO and Rh D compatibility required.

**DOSE**

Suggested dosage for red cells:

**Children**  
10 - 20mL/Kg  
(4mL/Kg will raise the Hb by approximately 10g/L)

For young children prescribe volume in mL. Dose will depend on indication. If advice required, contact haematologist.

**Neonates**  
As per WNHS Neonatal protocols: 20mL/Kg

**Adults**  
One RBC unit will raise the Hb by approximately 10g/L in average sized adult.

**Specific factors to consider**

- Patient’s cardiopulmonary reserve - if impaired, it may be necessary to consider transfusing at a higher threshold.

- Volume of blood loss - attempt to quantify the volume of blood loss before, during and after surgery, to ensure blood volume replacement is appropriate.

- When considering the decision to transfuse and the dosage, it is best to undertake careful clinical assessment of patients. A single-unit transfusion practice approach should be undertaken, with further clinical assessment after transfusion. Further transfusions are not required if the signs and symptoms are relieved. Clinical experience suggests that, in many patients, it may take 24 hours or more for patients to report an improvement in symptoms.

- In some situations, prescribing more than one unit at a time may not be appropriate; for example, where there is significant ongoing or anticipated blood loss, severe anaemia or the patient has chronic transfusion requirements (e.g. for bone marrow failure). The number of units prescribed, however, should still be carefully based on individual patient factors.

**ADMINISTRATION**

- Commence infusion within 30 minutes of removing from controlled 2-6°C storage.

- Transfusion duration is generally 2 hours in adults and 4 hours in neonates though RBC may be given faster in acute bleeding situations or more slowly if the patient’s condition dictates.

- Peripheral intravenous access should be sufficient to maintain an adequate rate for the transfusion without risk of haemolysis. 18-20 Gauge is recommended for adults and 22-24 Gauge or larger is recommended for paediatric patients.

- Red cells may be administered by Gravity or Plum A+ Pump using an approved blood administration set with a 170-200 micron filter designed to remove large aggregates formed during storage.

- Sets should be used and primed according to the manufacturer’s instructions.
The PLUM A+ line B or secondary infusion line contains a 200 micron filter which is appropriate for use with fresh blood products.

- For neonates and infants, special paediatric giving sets or screen filters for administration by syringe may be used provided they incorporate a 170-200 micron filter.
- As for all fresh blood products - Transfusion must be COMPLETE within 4 hours.

**PATIENT MONITORING**

Severe reactions are most likely to occur within the first 15 minutes and patients MUST be closely observed during this period. It is preferable that the patient be located in an area where they can be closely observed by clinical staff throughout the transfusion.

Take observations as for all fresh blood products
- Baseline TPR and BP
- TPR and BP at 15 minutes and then hourly until completion.
- TPR and BP on completion.

Patients must be monitored and any suspected problem must be dealt with quickly and efficiently. If you suspect a transfusion reaction:
- STOP the transfusion
- Inform Medical Officer
- CODE BLUE if necessary
- Inform the Blood Bank
- Check Patient ID, labels and blood packs for discrepancies
- Monitor vital signs every 15 minutes until stable.
- Refer to Section 10 The Management and Reporting of Adverse Events

**DOCUMENTATION**

A record should be kept in the patient’s history of the following
- The date of infusion
- Patients observations and general condition during the infusion
- Amount given
- The bag sticker should be placed on the Transfusion Medicine Record sheet KEMH MR735 and the start and stop times and checking signatures should be completed in the relevant boxes.

**FOR FULL INFORMATION ON ADMINISTRATION, PATIENT MONITORING AND DOCUMENTATION PLEASE SEE TM PROTOCOLS SECTIONS 7, 8 AND 9**

**REFERENCES**

The Australian Blood Service (ARCBS) Blood Component Circular of Information 2015

ASBT NHMRC Clinical Practice Guidelines on the use of Blood Components September 2001


Patient Blood Management Guidelines