

Blood Products for Neonatal Transfusion

Transfusion of Red Cell Products

A. Red cells for top-up transfusion

Pedipaks should be used for all red cell top-up transfusions in infants. One blood donation is split into four equal volumes (approximately 50ml) and 2 or 4 packs are reserved for an individual baby, depending on weight. The use of pedipaks enables us to minimise patient exposure to multiple donors.

Pedipak specifications:

- Available in O Positive and O Negative
- CMV Negative
- Leucocyte Depleted
- Suitable for top-up transfusion until expiry (42 days from collection)
- Commence transfusion within 30 minutes of product receipt and complete transfusion within 4 hours of spiking pack.



Pedipaks

Volume to be infused:

Routine – 15 - 20ml/Kg over 4 hours. Infants may require IV Frusemide (per RWH Drug Manual) half way through the transfusion – discuss with neonatologist/fellow

Emergency – larger volume over shorter time period depending on condition of infant.

B. Red cells for Exchange Transfusion

Exchange transfusion is generally carried out for hyperbilirubinaemia and/or anaemia usually due to haemolytic disease of the newborn (HDN) or prematurity.

ARCBS produces a red cell product specifically for neonatal exchange transfusion. This red cell product has the following specifications:

- Group O Negative
- Kell negative
- CMV negative
- Leucocyte Depleted
- Fresh (≤ 5 days)
- Known haematocrit (< 0.6)
- Irradiated at ARCBS (should be transfused within 24 hours of irradiation)
- Commence transfusion within 30 minutes of product receipt and complete transfusion within 4 hours of spiking pack.

Transfusion of Albumin

Volume to be infused:

- 4% Albumin - as a volume expander. 10 – 20ml/Kg over 30 – 60 minutes
- 20% Albumin - used for hypoalbuminaemia. 1g/Kg (2-5ml/Kg) over 30 – 60 minutes and given with Frusemide

Transfusion of Platelet Products

The platelet products suitable for neonatal transfusion are single units prepared from whole blood donations or apheresis collections split into small packs for paediatric use. All platelet products prepared in Victoria are leucocyte depleted by ARCBS. The words 'Leucocyte Depleted' will appear on the product label. In times of shortage platelet products collected in other States may be provided. These may not be leucocyte depleted. ** Check the product label**

COMPONENT NAME & VOLUME

PLATELETS 40-60ml	PLATELETS APHERESIS 40-60ml
Leucocyte Depleted	Paediatric, Part 1,2,3,4 of 4
Irradiated	Leucocyte Depleted
	Irradiated

Platelet specifications

- Where possible, infants should receive ABO and Rh(D) identical platelets.
- Avoid giving Rh(D) positive platelets to Rh(D) negative female infants.
- All Platelets are irradiated by ARCBS
- Product expires 5 days from collection
- Commence transfusion within 30 minutes of product receipt and complete transfusion within 4 hours of spiking pack.

Volume to be infused: Usual dose is 10ml/Kg (should transiently increase platelet count by $50-100 \times 10^9/L$) over 30-60 minutes.

Transfusion of FFP

Fresh Frozen Plasma must be compatible with the infant's red cell antigens (i.e. should be group identical or group AB)

- Paediatric FFP is available in group AB as a stock item.
- Average volume 60ml.
- Requires 30 minutes notice for thawing
- Does not require leucocyte depletion or irradiation
- Commence transfusion within 30 minutes of product receipt and complete transfusion within 4 hours of spiking pack.

Volume to be infused: 10 – 15 ml/Kg (to correct coagulation abnormality) over 30-60 minutes

Transfusion of Cryoprecipitate

- Cryoprecipitate is available in group O and A
- Average volume 20-30ml.
- Requires 30 minutes notice for thawing
- Does not require leucocyte depletion or irradiation
- Commence transfusion within 30 minutes of product receipt and complete transfusion within 4 hours of spiking pack.

Volume to be infused: 5ml/Kg over 30 minutes

Transfusion of IntragamP (see separate guideline)

Blood Product Modifications

Irradiation

Red blood cells for neonatal transfusions at RWH NICU/SCN are irradiated if the transfusion occurs within established clinical guidelines:

- Exchange transfusion
- Transfusion after Intra-uterine Transfusion
- When the donor is a first or second degree relative (directed donation) or HLA matched
- When the infant has proven or suspected immunodeficiency

All platelet products used within RWH are irradiated before issue by ARCBS. Irradiation does not alter expiry time for platelet products.

Irradiated red cells will be requested from ARCBS when required. It is the medical officer's responsibility to indicate that irradiated red cells are required. The expiry time for irradiated red cells is 24 hours from irradiation.

FFP and cryoprecipitate have extremely low numbers of viable cells and do not require irradiation.

Leucocyte Depletion

All neonates should receive leucocyte depleted Red Cell and Platelet products. Leucocyte depleted Red Cells and Platelets are provided by ARCBS whenever possible. Check the blood product label. If label does not state "Leucocyte Depleted" administer via leucocyte depletion filter as per Neonatal Transfusion Policy.

FFP and Cryoprecipitate do not require leucocyte depletion.

Cytomegalovirus (CMV) negative products

The guidelines of the UK Transfusion Services (2002) state that blood transfused in the first year of life should be CMV seronegative. Other authorities state that products that have been leucocyte depleted to less than 5×10^6 /unit have a significant reduction in the risk of CMV transmission. Transfusion recipients at greatest risk of CMV transmission are fetuses, infants weighing less than 1.5kg, immunodeficient patients and stem cell transplant recipients.

Some clinicians may prefer CMV seronegative components for patients considered to be particularly susceptible to severe CMV infection (patients with cellular immunodeficiency and stem cell transplant recipients). When CMV seronegative products are not available, leucocyte depleted products are an acceptable alternative. Since 60-70% of the adult population is CMV seropositive, CMV seronegative products may not always be available