

TRANSFUSIONS OF RED BLOOD CELLS

INDICATIONS

- For acute blood loss with shock:
- transfuse to re-establish adequate blood volume and haemoglobin of 13 g/dL
- For top-up blood transfusion, **consider** red cell transfusion for the following:

Infant	Hb (g/dL)
Ventilated infant	12
Infant in supplemental oxygen/CPAP	10
Severe congenital heart disease	12
Apnoeas (while on caffeine citrate; >9 episodes in 12 hr, or ≥2 episodes in 24 hr needing face mask ventilation)	8
Poor weight gain (<10 g/kg/d over 4 days despite nutritional intake of 120 kcal/kg/d), and no other cause (e.g. hyponatremia, recent use of corticosteroids or diuretics)	8
Circulatory strain (Heart rate >180/min, or respiratory rate >80/min for 24 hr in the absence of a medically treatable cause other than anaemia)	8
Asymptomatic infant (Retic count <4%)	7

PRE-TRANSFUSION

Crossmatch

- Crossmatch against maternal serum
- For first transfusion, send samples of baby's and mother's blood
- naturally occurring anti-A and anti-B do not develop before 6 months of age and neonates very rarely form red cell antibodies before this age – all antibodies are therefore passively derived

Direct Coombs testing

- The laboratory will perform Direct Coombs test (DCT) on maternal serum for any atypical antibodies
- If maternal DCT negative, blood issued will be cross-matched **once** against maternal serum. No further blood samples are necessary for repeat top-up transfusions
- If maternal DCT positive, cross-matching of donor red blood cells against maternal serum is required **every time**

Multiple transfusions

- In babies <29 weeks who will need multiple transfusions, use paediatric satellite packs from one donor (if available) to reduce multiple donor exposure

Communication

- If clinical condition permits before transfusion, inform parents that baby will receive a blood transfusion

When to use irradiated blood

Blood for **routine** top-up transfusions does not need to be irradiated except for infants:

- Who have received intra-uterine transfusion
- With suspected or proven immunodeficiency
- Receiving blood from a first or second degree relative, or an HLA-selected donor

When to use CMV-free blood

- As CMV seronegativity cannot be guaranteed in untested blood, **use only CMV-seronegative blood for neonatal transfusions**

- Blood products in use in the UK are leuco-depleted to $<5 \times 10^6$ leucocytes/unit at point of manufacture

Special situations

Infants with necrotising enterocolitis (NEC)

Neuraminidase-producing organisms such as clostridia in the occasional infant with NEC can strip sialic acid residues from red cell sialoglycoproteins, exposing the T-crypto-antigen. This can result in T-cell activation and haemolysis

- Transfuse infants with NEC using red cells in SAG-M as it is relatively plasma-free
- Any unexpected haemolysis associated with transfusion in a baby with NEC should be investigated for T-cell activation in consultation with local haematology department and with close involvement of consultant neonatologist

Exchange transfusion

- See **Exchange transfusion** guideline

TRANSFUSION

Volume of transfusion

- Ignore pre-transfusion Hb when estimating volume required
- give 20-25 mL/kg of red cell transfusion irrespective of pre-transfusion Hb

A paediatric pack contains approximately 50 mL blood. Use one pack if possible

Rate of administration

- Administer blood at 5 mL/kg/hr (over 4 hr for a 20 mL/kg transfusion)
- Increase rate in presence of active haemorrhage
- Decrease rate if there is a risk of cardiac failure
- Clearly document reason for top-up transfusion and, if it was because of symptoms, response to transfusion

Use of furosemide

- Routine use of furosemide is **NOT** recommended
- It may be used after a blood transfusion for infants:
 - with chronic lung disease
 - in heart failure
- If required, administer furosemide after (not during) transfusion