TRANSFUSIONS OF RED BLOOD CELLS

INDICATIONS

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

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

PRE-TRANSFUSION

**Communication**

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

**Crossmatch**

- For top-up transfusions in well baby, arrange with blood bank during normal working hours
- Crossmatch against maternal serum
- For first transfusion, send samples of baby's and mother's blood

**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

**When to use irradiated blood**

- It is preferred practice for all blood given to babies to be irradiated. However, irradiated blood MUST always be given for those:
  - 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)*

- Transfuse infants with NEC using red cells in saline, adenine, glucose, mannitol (SAG-M), preferably, 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 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.
- Clearly document reason for top-up transfusion and, if it was because of symptoms, response to transfusion.

**Use of furosemide**

- Routine use **NOT** recommended.
- If required, administer after (not during) transfusion.
- Consider after a blood transfusion for infants:
  - with chronic lung disease.
  - with haemodynamically significant PDA.
  - in heart failure.

**DOCUMENT**

- Clearly document reason for top-up transfusion and, if it was because of symptoms, response to transfusion.