COAGULOPATHY

- Haemostasis is immature during the neonatal period and does not attain full function until 6 months of age
- Prolonged prothrombin time (PT) and activated partial thromboplastin time (APTT) are associated with intraventricular haemorrhage (IVH) in unstable (e.g. hypotensive or hypoxic) or bruised extremely preterm babies
- 75% of cases of IVH occur within first 24 hr of life and 90% within first 7 days
- It is not necessary to correct abnormal coagulation in preterm babies with stable blood pressure, oxygen requirement, etc
- Prophylactic fresh frozen plasma (FFP) does not prevent IVH in stable preterm babies

INVESTIGATIONS

Check clotting in:
- Any bleeding neonate
- Moderate-to-severe encephalopathy
- Septicaemia
- Necrotising enterocolitis
- Extremely preterm (<28 weeks gestation) with bruising, or unstable
- Metabolic disease: urea cycle disorder, galactosaemia, tyrosinaemia, organic acidaemia
- Liver dysfunction
- Neonates undergoing surgery or tissue biopsy who have had previous bleeding problems
- Family history of inherited bleeding disorder (after discussion with consultant haematologist)

Sampling
- Ensure a free-flowing venous sample
- Use fresh coagulation tubes from refrigerator
- Fill exactly to black mark on tube (usually 1.3 mL)
- If sample clots (this does not confirm normal coagulation), take another
- When venous samples are unavailable, obtain sample from an indwelling arterial catheter after taking 1 mL blood which can be given back to baby before the flush

Request
- Prothrombin time (PT)
- Activated prothrombin time (APTT)
- Fibrinogen
- If features of DIC (e.g. bruising, bleeding, sepsis), request:
  - Fibrin degradation products and D-dimer
- Consider further tests depending on results of initial profile and after discussion with consultant haematologist

Reference values for PT and APTT:

<table>
<thead>
<tr>
<th></th>
<th>Preterm</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT (sec)</td>
<td>11-22</td>
<td>10-16</td>
</tr>
<tr>
<td>APTT (sec)</td>
<td>28-101</td>
<td>31-55</td>
</tr>
<tr>
<td>Fibrinogen (g/L)</td>
<td>1.5-3.7</td>
<td>1.7-4.0</td>
</tr>
</tbody>
</table>

See www.transfusionguidelines.org.uk

IMMEDIATE TREATMENT

- Give vitamin K (phytomenadione) 100 microgram/kg IV (maximum dose 1 mg) to all infants if not already administered IM
- If PT/APTT beyond upper limit of reference range, give FFP 10 mL/kg over 30 min
- Repeat coagulation screen and repeat dose if still abnormal
Coagulopathy 2009-11

- If coagulopathy not responding to FFP, or fibrinogen low, use cryoprecipitate 5 mL/kg over 30 min
- Repeat coagulation screen and repeat dose if still abnormal

**MONITORING**
- Repeat coagulation profile every 12 hr if indication persists
- Look for and treat causes of abnormal coagulation:
  - sepsis
  - shock
  - haemorrhage
  - severe hypothermia
  - hypoxia
- If abnormal coagulation persists for >24 hr in the absence of any precipitating factors, seek advice from tertiary centre paediatric haematologists about factor assays and 50:50 mixture correction test