Guideline for platelet transfusion

Definition of thrombocytopenia:
Platelet count in fetal life remains in the normal adult range (Forestier et al. 1991). Thus, thrombocytopenia is defined as <150x10⁹/l for all newborns, regardless of gestational age.

Table 1:

<table>
<thead>
<tr>
<th>Week of Gestation</th>
<th>WBC* (x 10⁹/L)</th>
<th>Total WBC Counts (x 10⁹/L)</th>
<th>PLT (x 10⁹/L)</th>
<th>RBCs (x 10¹²/L)</th>
<th>Hb (g/100 ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-21 (n = 760)</td>
<td>4.68 ± 2.96</td>
<td>2.57 ± 0.42</td>
<td>234 ± 57</td>
<td>2.85 ± 0.36</td>
<td>11.69 ± 1.27</td>
</tr>
<tr>
<td>22-25 (n = 1,200)</td>
<td>4.72 ± 2.82</td>
<td>3.73 ± 2.17</td>
<td>247 ± 59</td>
<td>3.09 ± 0.34</td>
<td>12.2 ± 1.6</td>
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<tr>
<td>26-29 (n = 460)</td>
<td>5.16 ± 2.53</td>
<td>4.08 ± 0.84</td>
<td>242 ± 69</td>
<td>3.46 ± 0.41</td>
<td>12.91 ± 1.38</td>
</tr>
<tr>
<td>&gt; 30 (n = 440)</td>
<td>7.71 ± 4.99</td>
<td>6.40 ± 2.99</td>
<td>232 ± 87</td>
<td>3.82 ± 0.64</td>
<td>13.64 ± 2.21</td>
</tr>
</tbody>
</table>

However, a large prospective cohort study suggests lower reference ranges for platelets in newborn infants (Christensen et al. 2009).

Figure 1: Mean (5th to 95th centile) platelet count in newborn infants (a) born at different gestations in the first 3 days and (b) in the first 3 months after birth (Christensen et al. 2009).

Incidence of thrombocytopenia:
Incidence of thrombocytopenia ranges from 1-5% of all newborns, and 22-35% of those admitted to a NICU. Prevalence of severe thrombocytopenia (< 50X10⁹/l) is reported to be between 2.4 – 10% (Chakravorty and Roberts 2012).

Causes: by time of onset (Roberts and Murray 2008)

Table 2: Classification of fetal and neonatal thrombocytopenia by time of onset.
Clinical implications of thrombocytopenia:
Thus far, no link has been established between severe thrombocytopenia and major haemorrhage (IVH, pulmonary or gastro-intestinal haemorrhage) in observational studies (Stanworth et al. 2009). The only RCT addressing platelet transfusion thresholds showed no change in the incidence of haemorrhage when platelets were maintained >150x10^9/l compared with controls with platelet counts of 50-150x10^9/l (Andrew et al. 1993). A recent retrospective cohort study reached the same conclusions (Von Lindern et al. 2012)

Management
The overall trend as well as the actual value should be considered when assessing the need for transfusion.
Suggested platelet transfusion (20ml/kg over one hour) thresholds in the following circumstances (Gibson et al. 2004):

- <50x10^9/l Preterm or term neonate, with major haemorrhage
- <30x10^9/l Preterm or term neonate, with major haemorrhage
- <30x10^9/l <1 kg and <1 week age
- <30x10^9/l Clinically unstable (fluctuating BP)
- <30x10^9/l Previous major bleeding (Grade 3–4 IVH)
- <30x10^9/l Current minor bleeding: petechiae, puncture site oozing, blood-stained ET secretions
- <30x10^9/l Coagulopathy
- <30x10^9/l Requiring surgery or exchange transfusions
- <30x10^9/l Sick preterm or term neonate, not bleeding
- <30x10^9/l Known NAITP
- <20x10^9/l Stable preterm or term neonate, not bleeding

Ensure that platelets are administered as soon as they arrive on the unit as deactivation occurs rapidly.

The unit is recruiting to the PLANET 2 study, through 2013.

References:

Dr M Chakraborty and Dr Sybil Barr May 2013 to be re-evaluated May 2016.