1. In critically ill patients, what is the effect of RBC transfusion (allogeneic) on patient outcomes?

RBC transfusion may be independently associated with:
- Ventilator-associated pneumonia
- Infection
- ARDS or ALI

RBC transfusion has uncertain effect on:
- Mortality
- Organ failure

Liberal and Restrictive RBC transfusion strategies have similar effects on:
- Mortality
- Organ failure and dysfunction
- Pneumonia and ARDS
- Infection

Therefore a restrictive transfusion strategy should be employed.

<table>
<thead>
<tr>
<th>Hb g/L</th>
<th>Transfusion</th>
<th>Transfusion related ADRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;70</td>
<td>Yes</td>
<td>Uncertain</td>
</tr>
<tr>
<td>70-90</td>
<td>Maybe</td>
<td>Uncertain</td>
</tr>
<tr>
<td>&gt;90</td>
<td>No</td>
<td>Uncertain</td>
</tr>
</tbody>
</table>

For patients with ACS see guidelines from Module 3 – Medical.

2. In critically ill patients, what is the effect of non-transfusion interventions to increase haemoglobin concentration on morbidity, mortality and need for RBC blood transfusion?

<table>
<thead>
<tr>
<th>Effect of ESA (erythropoietin stimulating agents)</th>
<th>Heterogeneous population of critically ill patients</th>
<th>Trauma patients who are critically ill.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect on mortality</td>
<td>No effect</td>
<td>Decrease</td>
</tr>
<tr>
<td>Incidence of RBC transfusion</td>
<td>No effect</td>
<td>No effect</td>
</tr>
<tr>
<td>Risk of thromboembolic events</td>
<td>Increase</td>
<td>No effect</td>
</tr>
</tbody>
</table>

ESAs should not be routinely used in critically ill anaemic patients

Iron has uncertain effect on mortality and incidence of RBC transfusion.

3. In critically ill patients, what is the effect of FFP, cryoprecipitate, fibrinogen concentrate, and/or platelet transfusion on patient outcomes?

<table>
<thead>
<tr>
<th>FFP:</th>
<th>Trauma</th>
<th>Non Trauma</th>
<th>Elderly patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFP Mortality</td>
<td>Uncertain</td>
<td>Uncertain</td>
<td></td>
</tr>
<tr>
<td>Transfusion related ADRS</td>
<td>Associated</td>
<td>Yes – ARDS and ALI</td>
<td></td>
</tr>
</tbody>
</table>

The routine use of FFP in critically ill patients with coagulopathy is not advised.

<table>
<thead>
<tr>
<th>Cryo</th>
<th>Mortality</th>
<th>Uncertain</th>
<th>Transfusion</th>
<th>Uncertain</th>
</tr>
</thead>
</table>

The routine use of cryoprecipitate and fibrinogen concentrate in critically ill patients with coagulopathy is not advised.

4. In critically ill patients, what is the effect of strategies that minimise blood loss on morbidity, mortality and blood transfusion?

<table>
<thead>
<tr>
<th>Cell saver:</th>
<th>Mortality</th>
<th>Allogenic transfusion</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
<td>No effect</td>
<td>Reduces</td>
<td></td>
</tr>
<tr>
<td>Surgery for ruptured AAA</td>
<td>Uncertain</td>
<td>Reduces</td>
<td></td>
</tr>
</tbody>
</table>

In critically ill trauma patients + patients for emergency AAA surgery, use of cell salvage may be considered.

<table>
<thead>
<tr>
<th>Tranexamic Acid</th>
<th>Acutely bleeding critically ill trauma patients</th>
<th>Within 3 hours reduces mortality</th>
<th>No effect</th>
<th>No effect on risk of stroke. PE. DVT. Reduces risk of MI.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper GI bleed</td>
<td>Reduces risk</td>
<td>No effect</td>
<td>No effect</td>
<td>Thromboembolic effect is uncertain.</td>
</tr>
</tbody>
</table>

In these two circumstances TXA should be used. Use of TXA 3 hours after injury may be harmful.

The suggested dose of TXA administered is a 1 g bolus followed by a 1 g infusion

Tissue plasminogen activator is a major enzyme responsible for conversion of plasminogen into active plasmin, which in turn is responsible for fibrinolysis or the breakdown of thrombus. Tranexamic acid (TXA) is an antifibrinolytic that inhibits both plasminogen activation and plasmin activity, thereby preventing thrombus lysis.

TXA is registered for the reduction of peri and post-operative blood loss and the need for blood transfusion in:
- Adults - cardiac surgery
  - total knee arthroplasty
  - total hip arthroplasty
- Children - cardiac surgery

By J Pigou