AREA of APPLICATION

Intraoperatively salvaged blood, despite washing, may contain a number of components including microaggregates, fat globules and activated neutrophils. The AABB 4th edition of Standards for Perioperative Autologous Blood Collection and Administration\(^1\) states that “Perioperative products intended for transfusion shall be transfused through a filter designed to retain particles that are potentially harmful to the patient”.

STAFF

All staff involved in the cell salvage process.

PROCEDURE:

There are a number of filters available which can be used with salvaged blood, the simplest of which is the 200µm screen filter found in a standard blood administration set.

<table>
<thead>
<tr>
<th>Type of filter</th>
<th>Medium</th>
<th>Removes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard blood administration set</td>
<td>200µm screen</td>
<td>Blood component and non-blood component particulate matter</td>
</tr>
<tr>
<td>Microaggregate blood filter</td>
<td>40µm screen</td>
<td>Blood component microaggregates and non-blood component particulate matter</td>
</tr>
<tr>
<td>Lipid depleting microaggregate filter</td>
<td>40µm screen</td>
<td>Microaggregates, lipids, C3a, some leucocytes</td>
</tr>
<tr>
<td>Leucodepletion filter</td>
<td>Affinity filter</td>
<td>Leucocytes, lipids, and microaggregates</td>
</tr>
</tbody>
</table>

Special circumstances:

**Obstetrics & malignancy** – the use of the LeukoGuard® RS Leukocyte Removal Filter for Salvaged Blood is recommended in obstetrics\(^2\) & malignancy\(^3\). The flow rate is 82(41-112)ml/min and the maximum capacity per filter is around 450ml (for washed intraoperatively salvaged blood). This filter is the only one that has been shown to effectively remove contaminants specific to these settings.

*Caution*: MHRA Safety Alert\(^4\)

Nationally there have been an increasing number of reports regarding severe hypotension observed during reinfusion of salvaged blood when using leucodepletion filters. The MHRA produced a safety alert in January 2011 regarding the use of leucodepletion filters in cell salvage. All such incidents should be reported to SHOT\(^5\).
**Cardiac surgery** - there is an argument for the use of leucodepletion filters in the cardiac setting where the reinfusion of activated neutrophils may exacerbate reperfusion injury. There is however, no robust evidence for this.

**Orthopaedic surgery** - some clinicians support the use of a lipid depleting microaggregate filter in orthopaedic surgery as there is a theoretical concern that fat globules released from bone marrow may be reinfused resulting in fat embolism syndrome. Again, there is no robust supporting evidence. To allow any fat present in the cell salvaged blood to form a layer at the top, the blood should not be agitated prior to reinfusion. Avoiding reinfusing the last few millilitres of blood where the layer of fat lies, should reduce the risk of this being returned to the patient.

**REFERENCES**
5. Serious Hazards of Transfusion (SHOT) [http://www.shotuk.org/sabre/](http://www.shotuk.org/sabre/)

The information contained in this ICS Technical Factsheet has been sourced from members of the UK Cell Salvage Action Group (UKCSAG) and is generally agreed to be good practice. The UKCSAG does not accept any legal responsibility for errors or omissions.