

USE OF FILTERS IN ICS

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.

Type of filter	Medium	Removes
Standard blood administration set	200µm screen	Blood component and non-blood component particulate matter
Microaggregate blood filter	40µm screen	Blood component microaggregates and non-blood component particulate matter
Lipid depleting microaggregate filter	40µm screen	Microaggregates, lipids, C3a, some leucocytes
Leucodepletion filter Caution*	Affinity filter	Leucocytes, lipids, and microaggregates

Special circumstances:

Obstetrics & malignancy – the use of the LeukoGuard® RS Leukocyte Removal Filter for Salvaged Blood is recommended in obstetrics² & malignancy³. 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 Alert⁴

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 SHOT⁵.

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

1. American Association of Blood Banks (AABB) Standards for Perioperative Autologous Blood Collection and Administration (4th Edition)
2. National Institute for Health and Clinical Excellence (NICE) (November 2005) Intraoperative blood cell salvage in obstetrics
<http://www.nice.org.uk/nicemedia/live/11038/30690/30690.pdf>
3. National Institute for Health and Clinical Excellence (NICE) (April 2008) Intraoperative red blood cell salvage during radical prostatectomy or radical cystectomy
<http://www.nice.org.uk/nicemedia/live/11891/40380/40380.pdf>
4. MHRA Safety Alert (January 2011) *One Liners* (Issue 82)
<http://www.mhra.gov.uk/Publications/Safetyguidance/OneLiners/CON105973>
5. Serious Hazards of Transfusion (SHOT) <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.