

Classification: Guideline

Responsible for review: Specialist Practitioner of Transfusion

Ratified by : Hospital Transfusion Committee
Theatre Procedures Committee

Applicability: All patients

Use of intra-operative cell salvage is a clinical decision and each case should be considered individually. The following are *suggested* guidelines for use (**see note A*)

INDICATIONS FOR USE:

Surgery in a clean operative field when anticipated blood loss is greater than 20% of blood volume, or approximately one litre in an adult. For example, the technique is widely used during cardiac surgery, non-infected major joint revision arthroplasty, scoliosis surgery, vascular surgery, major urological procedures and trauma surgery.

CONTRAINDICATIONS:

1. Patient declines the procedure
2. Contamination of the surgical field with faeces, urine or amniotic fluid (**but see note B*)
3. The presence of infection in the operative field.
4. The presence in the operative field of malignant tumours with the potential for metastatic spread. (**but see note B*)
5. Patients with sickle cell disease, trait and other red cell disorders.

WARNINGS:

Do **NOT** use if the surgical **field** contains: Betadine / Chlorhexidine
Hydrogen peroxide
Alcohol
Distilled water
Antibiotics not for parenteral use
Fibrin adhesives

AVOID aspirating into the collection set: Topical clotting agents (collagen, thrombin)
Bone cement

In major joint replacement surgery there may be concerns regarding the aspiration into the collection reservoir of potentially hazardous substances, e.g. chlorhexidine and bone cement. These difficulties may be avoided by having two sets of working suction apparatus – one to the cell salvage collection reservoir, and the other to standard collection (for disposal), and by ensuring that the surgical field is irrigated well with normal saline before recommencing collection for cell salvage.

GUIDELINES FOR USE:

1. Use of cell salvage should be discussed with the patient in advance (when possible) and this should be documented on the anaesthetic chart or in the patient notes. A patient information leaflet is available to facilitate this.
2. The cell salvage operator must be named for each individual case. The operator must have received specific training, and be named on a register of trained operators. The equipment must be used in accordance with the manufacturer's instructions. (**Caution:** Heparinised normal saline **MUST** be attached to the cell salvage machine immediately after mixing, and must not be left elsewhere in the theatre or anaesthetic room. This is to avoid the potential risk of administration to the patient).
3. The responsible medical officer must be named for each individual case and should be familiar with the clinical aspects of cell salvage.
4. Regular / continuous audit of cases should be undertaken, and each individual unit of salvaged blood must have an audit trail. To maintain these standards, all cell salvage procedures and volumes of blood re-infused must be documented in the patient's records using the Intra-operative Cell Salvage Data Collection Form (one copy to patient's casenotes, one copy for retention in file).
5. Salvaged blood packs must be clearly labelled with the patients name, hospital number, date of birth, date and time of collection, the signature of the person performing the procedure and the words 'FOR AUTOLOGOUS USE ONLY'.
6. Prior to transfusing the blood back to the patient, the identity of the patient must be confirmed in accordance with Trust Guideline : 'Blood and blood products administered by qualified nurses and healthcare professionals'.
7. Strict aseptic technique must be maintained at all times.
8. Salvaged cells should be re-infused within a maximum of six hours of the commencement of collection, in order to minimize the risk of infection. They must remain with the patient in theatre, at room temperature. The units must not be removed to a blood fridge under any circumstances, as this greatly increases the risk of the blood being given to the wrong patient.
9. Blood filters should be used according to the manufacturer's instructions. Most manufacturers recommend the use of a standard 40 micron in-line leucodepletion blood filter. In some cases, e.g. salvage in potentially metastatic malignant fields, a log 5 cell filter should be used (*see note B*).
10. Ensure wash fluid is isotonic (0.9%) saline only.

11. Keep anticoagulant solutions apart from fluids for intravenous infusion
12. Collection of blood from swabs is only recommended in certain cases and when scrub staff have experience of the technique.
13. Beware dilutional coagulopathy and anaemia with large volume losses. If indicated, measure haematocrit / haemoglobin / coagulation profile during the procedure.
14. Salvaged blood presents the same health and safety hazards as bank blood, and thus universal infection control precautions must be maintained. Used blood packs from the cell salvage procedure must be disposed of as hazardous waste, in accordance with the control of infection procedures.
15. A unit of salvaged blood must only be transferred to the ward setting if the transfusion has already been initiated in the operating theatre.
16. Any adverse events involving the use of ICS must be notified to the Hospital Transfusion Team and an incident report raised. The Hospital Transfusion Team will, if necessary, in turn report the adverse event to the Hospital Transfusion Committee and the national haemovigilance bodies.

NOTES:

NOTE A

This is a guideline for the use of cell salvage. Ultimately the use of this equipment is a clinical decision and there may be individual situations where it is in the best interest of the patient to operate outside the guidelines e.g. uncontrollable haemorrhage when the demand for bank blood may outstrip the supply.

NOTE B

A recent NICE Guideline (November 2005) suggests that ICS may be used in obstetric surgery even in the presence of amniotic fluid, providing a 40 micron, leucocyte depletion blood filter is used. However, this is the decision of the individual clinician based upon assessment of the evidence and risk vs. benefit. For example, there may be situations where the potential benefit outweighs the unquantifiable risk, i.e. lack of bank blood.

The use of cell salvage in the presence of tumours with the potential for metastatic spread remains controversial. There may be situations where the potential benefit outweighs the unquantifiable risk e.g. the Jehovah's Witness patient. If blood is salvaged in potentially metastatic tumour fields it should be re-infused using a log 5 cell filter.

Evidence based: Yes

References:

Guidelines for Autologous Transfusion II : Perioperative Haemodilution and Cell Salvage.

British Journal of Anaesthesia 1997;**78(6)**: 768-771

Guidelines for the Administration of Blood and Blood Components and the Management of the Transfused Patient
Transfusion Medicine 1999; **9**: 227-239

Intraoperative blood cell salvage in obstetrics
National Institute for Health and Clinical Excellence, London, 2005.

NHS Executive. Better Blood Transfusion: Appropriate Use of Blood.
Department of Health, London, 2002 (Health Service Circular 2002 /009)

Thomas D., Thompson R., & Ridler B.(2005)
A Manual for Blood Conservation
Shrewsbury: tfm Publishing Ltd.

www.transfusionguidelines.org.uk
www.nice.org.uk