

Guidelines For The Use of Cell Salvage In Obstetrics

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Guidelines for the Use of Cell Salvage in Obstetrics

Intraoperative Cell Salvage (ICS) is a technique for the collection, processing/washing and retransfusion of autologous blood during surgical procedures.

Benefits of cell salvage

1. To avoid the risks associated with conventional donor blood:
 - Infection (viruses, bacteria, prions)
 - Incompatibility reactions
 - Hypothermia
 - Cost
2. Cell saved blood has improved survival and oxygen carrying ability compared to banked blood²
3. To enhance the safety of Caesarean Section for patients who refuse donated blood products
4. To reduce the reliance on increasingly scarce donated blood

Indications for cell salvage

Cell salvage should be considered in patients with:

- Increased risk of bleeding / anticipated blood loss > 1000ml, for e.g.
 - Placenta praevia
 - Placenta accreta
 - Lower segment uterine fibroids
 - Multiple (three or more) repeat caesarean sections
 - Coagulation disorders
- Emergency Caesarean sections
- Low preoperative Hb (<105 g/l at term)
- Patients with multiple antibodies and difficulty with cross-matching / rare blood groups
- Patients with objections to receiving allogenic blood / Jehovah's Witnesses
- Discretion of the team

Absolute Contraindications to Cell Salvage

Pharmacological

- Clotting agents (Surgicel, Gelfoam, etc.)
- Irrigation solution (betadine, antibiotics meant for topical use)
- Methymethacrylate

Contaminants

- Urine, bowel contents, infection (chorioamnionitis), meconium

Patient Refusal

Relative contraindications to cell salvage

Malignancy

Haematological disorders

- Sickle cell trait and disease
- Thalassaemia
- Rhesus negative status

Pre blood collection

The ODA preparing the ICS must be adequately trained and competent in its use¹.

Patients should be consented verbally for cell salvage by the anaesthetist wherever possible and it should be documented that this has been done on the anaesthetic chart. The advantages and risks of ICS and allogenic blood transfusion should be discussed with the patient prior to surgery. If verbal consent is not possible e.g. in emergencies, use of cell salvage is at the discretion of the surgeon and anaesthetist responsible for the patient's care.

Jehovah's Witnesses may request a continuous circuit and the use of swab washing should be discussed with them.

Technical aspects of blood collection

Never delay the start of emergency surgery to set up the cell saver.

Initially, only the collection part of the cell salvage disposables should be set up, with the processing part of it ready to hand but unopened (NB if the patient is a Jehovah's Witness who has requested a continuous circuit, the full cell salvage disposable must be set up, primed with saline and connected to the patient's IV access using the appropriate filter before blood collection commences, by an operator who has been trained to do this).

During surgery, blood loss can be suctioned from the operative site and from washed swabs. Blood loss to swabs has been estimated at 30-50% of the total surgical blood loss.¹ By washing swabs, the blood that is normally discarded can be collected and the overall efficiency of red cell recovery improved.

Only 0.9% saline for intravenous use must be used for the washing of swabs, see box below.

Swab washing

Set up a sterile bowl with 2000ml **IV grade 0.9% saline (not saline for wash)**

Soak blood soiled swabs for a few minutes in the saline to extract red cells. Gently compress the swabs to express any residual solution before discarding.

At the end of the procedure aspirate the swab wash solution into the cell salvage reservoir using the suction line. The swab wash should not be left for more than six hours without processing.

If blood loss is to be calculated by the weighing of swabs, this should be done aseptically before washing the swabs with saline.

ICS should be discontinued when substances not licensed for intravenous (IV) use are present within the surgical field¹. Examples of substances that should not be aspirated include:

- Betadine / iodine
- Antibiotics not licensed for IV use
- Topical clotting agents

If clinically indicated or a sufficient volume of blood is collected, the anaesthetist will instruct to process the blood

Salvaged blood should always be labelled immediately with a patient's details taken from the patient's ID band. Addressograph labels should not be used as these are known to be a source of error in blood transfusion (e.g. wrong blood, wrong patient).

The salvaged blood should also be labelled with the collection start time and the expiry time of the salvaged blood.

Re-infusion of blood

In the event of catastrophic haemorrhage, a clinical decision to reinfuse the cell salvaged blood without a leucocyte depletion filter may be made to allow the blood to be reinfused more quickly. This decision must be made on an individual patient basis taking into account the risk and benefits.

Re-infusion should start before the patient leaves theatre in order to avoid "wrong blood, wrong patient" errors and positive patient identification between the label on the salvaged blood and the patient's ID band must be confirmed before reinfusion commences.

Processed blood should not be infused under pressure because of risk of air embolism.

Re-infusion should be completed within four hours from the completion of processing.

Only red blood cells suspended in saline are given back to the patient. Clotting factors and platelets are removed by cell salvage. When patients are transfused large volumes of cell salvaged blood, this is often accompanied by a coagulopathy, therefore consider taking an FBC and coagulation screen and giving other blood products. Consider use of ROTEM for more rapid assessment of coagulation product deficiencies.

Hand over to the midwife that cell salvage has been used.

If the mother is Rh(D) negative, a Kleihauer count should be obtained and the result of this test should be a guide as to whether additional Anti-D prophylaxis is needed.^{1,3,4,5} The Kleihauer blood sample must not be taken until the reinfusion of salvaged blood has been completed to ensure the levels of fetal red cell contamination of the salvaged blood can be established. Anti-D immunoglobulin must be administered in accordance with the recognized guidelines i.e. within 72 hours.

An audit form must be completed for every case by the ODA – found in the folder on the cell salvage machine .

Adverse event reporting

Any adverse events relating to the ICS device must be reported in accordance with the SBUHB Incident Reporting Policy. Additionally, where appropriate, reporting to the relevant external bodies should be undertaken, e.g. Serious Hazards of Transfusion (SHOT), Medicine and Healthcare products Regulatory Agency (MHRA).

Costings (December 2019)

Liverpool Woman's Hospital NHS Trust have shown through audit that sufficient blood was collected to trigger processing in 17% of cases when used for all emergency and elective caesarean sections except those at minimal risk of blood transfusion⁶.

The inclusion criteria in our guideline are tighter than those for Liverpool Women's hospital, so processing rate should be higher.

The current costs for cell salvage per patient are:

Collection £33.00

Processing £32.00

Total for cell salvaged blood £65.00

One unit of allogenic blood costs £147.51

References

1. Blood Transfusion and the Anaesthetist – Intra-operative Cell Salvage, AAGBI Safety Guideline. The Association of Anaesthetists of Great Britain and Ireland. September 2009
2. Catling SJ, Freitas O, Krishnan S, Gibbs R. Clinical experience with cell salvage in obstetrics: 4 cases from one UK centre. *International Journal of Obstetric Anaesthesia* 2002;11: 128-34.
3. Waters JH, Biscotti C, Potter PS, and Philipson E. Amniotic fluid removal during cell salvage in the caesarean section patient. *Anesthesiology* 2000, 92: 1531-1536.
4. Catling SJ, Williams S, Fielding AM. Cell salvage in obstetrics: an evaluation of the ability of cell salvage combined with leucocyte depletion filtration to remove amniotic fluid from operative blood loss at caesarean section. *International Journal of obstetric anaesthesia* 1999; 8 : 79-84.
5. Blood Transfusion in Obstetrics, Green-top Guidelines No47. Royal College of Obstetricians and Gynaecologists. December 2007.
6. Pathak D, McDonald A, Barclay P, Mallaiah S. Use of cell salvage in caesarean section. Unpublished Data. Anaesthetic Department, Liverpool Womens Hospital NHS Trust, Liverpool, UK.

Patient Information Sheet

National Institute for Health and Clinical Excellence

IPG144 Intraoperative blood cell salvage in obstetrics - information for the public

<http://guidance.nice.org.uk/IPG144/PublicInfo/pdf/English>

Obstetric cell salvage

Scrub Staff Responsibilities

The ODP will set up the cell salvage

Ask the anaesthetist and surgeon if they would like swab washing to take place.

If swab washing has been requested then, **in a sterile manner:-**

Set up a sterile bowel with 2000ml **IV grade 0.9% saline (not saline for wash)**

Soak all blood soiled swabs for a few minutes in the saline to extract red cells. Gently compress the swabs to express any residual solution before discarding the swab.

At the end of the procedure aspirate the swab wash solution into the cell salvage reservoir using the suction line.

If blood loss is to be calculated by the weighing of swabs, the ODP needs to be informed when the blood will be aspirated from the bowl, so that the volume of wash can be noted. The washed swabs can then be weighed and the blood loss calculated from the weights and the volume of wash.

Maternity Services

Checklist for Clinical Guidelines being Submitted for Approval

Title of Guideline:	Guideline for the use of Cell Salvage in Obstetrics
Name(s) of Author:	Anaesthetic Consultants
Chair of Group or Committee approving submission:	Labour ward Forum
Brief outline giving reasons for document being submitted for ratification	Update to expired guideline
Details of persons included in consultation process:	Consultant Anaesthetists / Labour Ward Forum
Name of Pharmacist (mandatory if drugs involved):	
Issue / Version No:	Version 3
Please list any policies/guidelines this document will supercede:	Replaces expired guideline
Date approved by Group:	May 2020
Next Review / Guideline Expiry:	May 2023
Please indicate key words you wish to be linked to document	Intraoperative, cell, salvage (ICS)
File Name: Used to locate where file is stores on hard drive	ABM Groups/Z/Maternity/Policies and Guidelines