Mothers, babies and blood
8th March 2012
South West Regional Transfusion Committee
Obstetric Cell Salvage

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Obstetrics

- ICS is being increasingly used in the UK in obstetrics for women at risk from massive obstetric Haemorrhage during caesarean section. In the year 2005-2006, 38% of UK maternity units used ICS, and 28% included the use of ICS in their Massive Obstetric Haemorrhage (MOH) protocol.

Allam J, Cox M, Yentis SM. Cell salvage in obstetrics. *International Journal of Obstetric Anesthesia 2008;* ***17:37- 45.***

Teig M, Harkness M, Catling S, Clarke V. *Survey of cell salvage use in obstetrics in the UK. International Journal of Obstetric Anesthesia 2007;* ***16: S30.***

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BBT3

2007Health Service Circular (HSC 2007/001) Better Blood Transfusion - *Safe and Appropriate Use of Blood*.

Objective

- Ensure the appropriate use of blood and the use of effective alternatives in every clinical practice where blood is transfused
- Secure appropriate and cost-effective provision of blood transfusion and alternatives in surgical care
- Ensure patients who are likely to receive a blood transfusion are informed of their choices

Action

- Develop a blood conservation strategy including the use of point-of-care testing for haemoglobin concentration and haemostasis and alternatives to donor blood such as peri-operative cell salvage and pharmacological agents such as anti-fibrinolytics and intravenous iron
- Ensure that the blood conservation strategy is implemented
- Ensure that timely information is made available to patients, informing them of the indication for transfusion, the risks and benefits of blood transfusion, and any alternatives available

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ICS Thought?

- When used in unfamiliar / emergency situations, cell salvage may lead to a poor outcome! Resulting from lack of knowledge and confidence in the equipment, therefore producing a reduced quality end product?

Six Key Points

- 1. Intra Operative Cell Salvage (ICS) is an efficacious technique for blood replacement.
- 2. Patients should be informed of theoretical issues around ICS prior to surgery.
- 3. ICS should be undertaken regularly in obstetrics, allowing teams to gain ICS experience.
- 4. ICS should be seen as part of a Blood Conservation program.
- 5. Teams should consider following up patients, to evaluate the risk of alloimmunisation.
- 6. Teams should consider implementing a Quality Control program, when offering an ICS service.

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The Principles of Intra Operative Cell salvage

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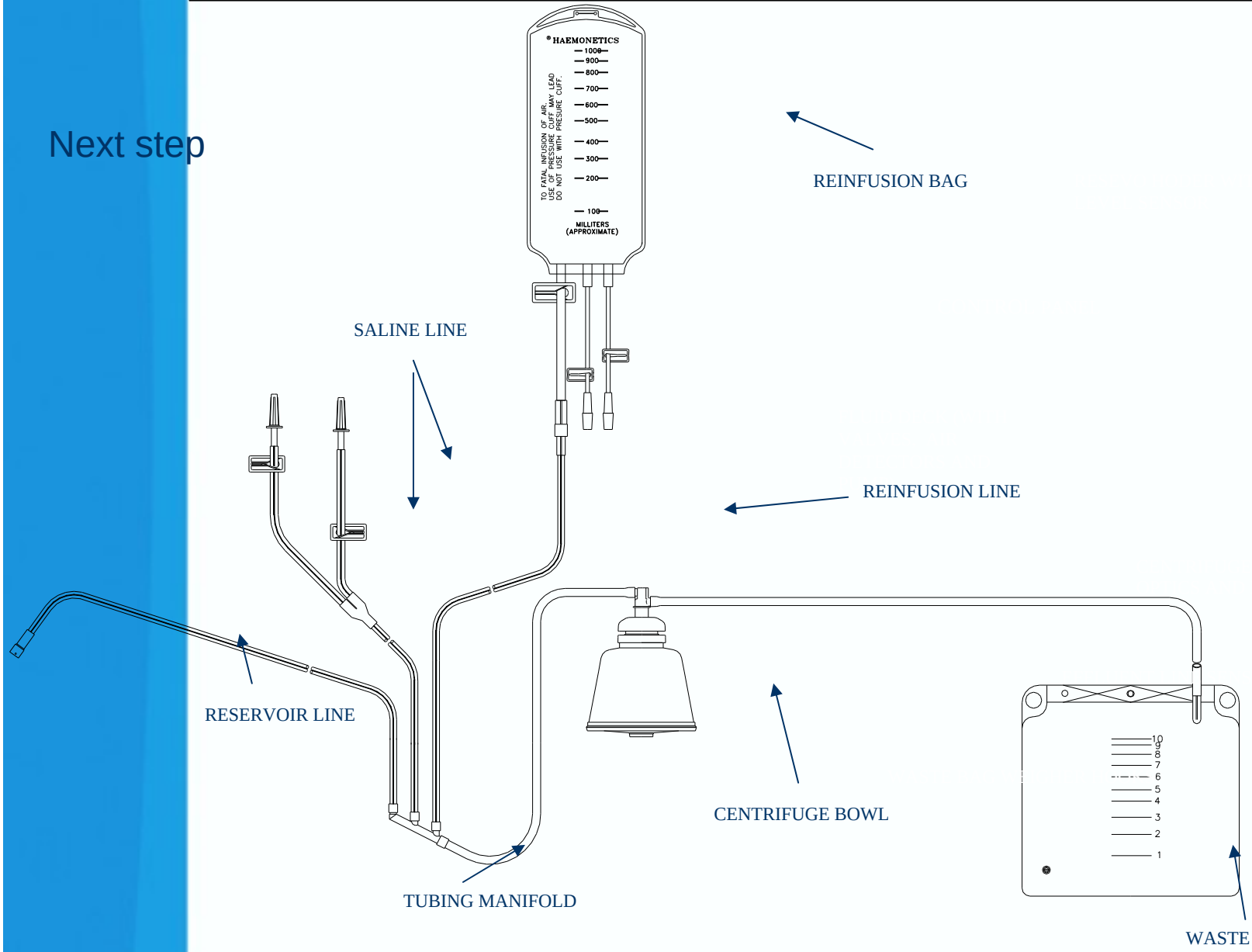
Disposable set components

Next step



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Cell Saver 5+
Donated by Friends
Of Hospital – Dedicated
Machine for Obs

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1. Intra Operative Cell Salvage (ICS) is an efficacious technique for blood replacement?

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NICE Statement

- Intraoperative blood cell salvage is an efficacious technique for blood replacement and its use is well established in other areas of medicine, but there are theoretical safety concerns when it is used in obstetric practice. Data collection is therefore important and clinicians should report all complications to the Medicines and Healthcare products Regulatory Agency.

National Institute for Clinical Excellence

What are the the THEORETICAL RISKS in OBS?

Amniotic Fluid Embolus

- Also known as anaphylactoid syndrome of pregnancy
- Possibly caused by Amniotic Fluid (AF) entering the maternal circulation, and so could be initiated by re-infusing any AF aspirated by the cell salvage machine

Alloimmunisation

- Fetal RBCs cannot be distinguished from maternal RBCs by cell salvage machines.
- Could theoretically cause haemolytic disease of the newborn and fetal hyperbilirubinemia and anaemia

Saving Mothers' Lives Reviewing maternal deaths to make motherhood safer: 2006–2008

The Eighth Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom, March 2011

- **Obstetric haemorrhage: Learning Points**

- Any decision to give women blood should be made carefully, and all clinicians involved in blood transfusion should be aware of the potential adverse effects of trans- fusion and signs and symptoms of transfusion-related complications. Women known to be at risk of major haemorrhage, e.g. those with placenta accreta and those who decline blood and blood products, should be delivered in maternity units with access to critical care, interventional radiology and cell salvage

- **Amniotic fluid embolism: Learning Points**

- Amniotic fluid embolism (AFE) should no longer be regarded as a condition with near universal maternal mortality. High-quality supportive care can result in good outcomes for both mother and baby depending on the place of collapse.

RCHT Tx rates

- Transfusion Rates at RCHT in Obs pre Cell Salvage/Blood Conservation = 2.30%

- Tx rates 2010 = 1%
- 2011?

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2. Patients should be informed of theoretical issues around ICS prior to surgery

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Risks of Red Cell Transfusion

- Acute Haemolytic Reactions 1 in 250,000 to 1 in 1,000,000
- Hepatitis B 1 in 450,000
- Hepatitis C 1 in 32,000,000
- HIV 1 in 5,000,000
- HTLV 1 in 12,500,000

Bacterial Contamination of

- Red Cell Concentrates 1 in 500,000

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CONSENT FORM 1

PATIENT AGREEMENT

Patient identifier detail /label

Name

Date of Birth

☐ Male ☐ Female

Hosp. No.

Name of Proposed Procedure or Course of Treatment (including brief explanation if medical term not clear)

Caesarean Delivery ("LSCS")

Special Requirements (e.g. other language, other communication method etc.)

Responsible health professional

Job title

Statement of Health Professional (to be filled in by health professional with appropriate knowledge of proposed procedure, as specified in consent policy)

I have explained the procedure to the patient/parent. In particular, I have explained:

The intended benefits To deliver baby safely

Serious or frequently occurring risks Infection, bleeding (more than is expected), blood clots, wound problems (e.g. bruising, pain, or very rarely breaking down), damage to other organs (e.g. bladder or bowel), baby can get bruised or cut, baby can have breathing problems (and need admission to the special care unit, especially when delivery occurs before 39 weeks). In the future, increased chance of needing a Caesarean and of the placenta being abnormally low. Very rarely the scar in the womb can rupture in a future pregnancy or labour.

Any extra procedures which may become necessary during the procedure

☒ blood transfusion Sometimes required if there is particularly heavy bleeding. We may be able to offer "blood salvage" where your own blood can be recycled. This should offer advantages over using donated blood, but there are theoretical risks of reacting against cells that originally come from the baby. Whilst we think these are extremely unlikely, it could cause allergic reactions or mean antibodies could affect future pregnancies.

☒ other procedure (please specify) In the rare event of other organs being damaged, any injury may need repair. Severe bleeding may need to be controlled by surgery; extremely rarely this can require a hysterectomy. If other problems are found (e.g. a cyst on the ovary) we can also address this.

I have also discussed what the procedure is likely to involve, the benefits and risks of any available alternative treatments (including no treatment) and any particular concerns of this patient.

☐ The following leaflet/tape has been provided

This procedure will involve:

☒ general and/or regional anaesthesia ☐ Local anaesthesia ☐ Sedation

Signed Date

Name (PRINT) job title

Contact Details (if patient wishes to discuss options later) Delivery Suite (01872 252361)

Statement of Interpreter (where appropriate)

I have interpreted the information above to the patient to the best of my ability and in a way in which I believe s/he can understand.

Signed Date Name (PRINT)

YELLOW TOP COPY - HEALTH RECORDS **White copy accepted by patient: yes or no** (please ring)

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Consent

Any extra procedures which may become necessary during the procedure

[X] blood transfusion **Sometimes required if there is particularly heavy bleeding.** We may be able to offer **"blood salvage"** where your own blood can be recycled. This should offer advantages over using donated blood, but there are theoretical risks of reacting against cells that originally come from the baby. Whilst we think these are extremely unlikely, it could cause allergic reactions or mean antibodies could affect future pregnancies.

[X] other procedure (please specify) **In the rare event of other organs being damaged, any injury may need repair. Severe bleeding may need to be controlled by surgery; extremely rarely this can require a hysterectomy. If other problems are found (e.g. a cyst on the ovary) we can also address this.**

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3. ICS should be undertaken regularly in obstetrics, allowing teams to gain ICS experience

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Obstetrics More!

- 80% of maternity units identified lack of training, rather than safety concerns, as the barrier to more frequent use of ICS.

www.aagbi.org/publications/guidelines/docs/cell%20_salvage_2009_amended.pdf

ICS Set Up

- Should we only use cell salvage when there is a predicted blood loss of 1000mls?
  - **WHY NOT**
- Set up a collection set for cases at risk to Tx
- Make it the norm not exception

Why Routine?

- Allows the user to become familiar with the machine
- Ability to understand the situation
- Ability to make decisions during the case
- Move from independent IOCS user to integrated user – supporting both anaesthetist and operating the IOCS machine.

Obs Transfusion Rates when using ICS

April 2011 to Date

- 8 patients have had a tx, when using ICS

  = 23 RBC units

- 12 patients, where the blood was requested and returned unused

Blood Requested but not Used!

- 12 patients
- Total - 44 red cell units
  - 44 x £125 = £5,550
- Average reinfused ICS blood 331 mls
  - ICS costs = £1200

RCHT ICS Usage

- April – Dec 2011
- OrthoPat – 369
- Electa – 340
- Cell Saver 5+ (Obs) - 502
  (Gen) – 16

- Total – 1227 ICS cases

(Collection and processing)

RCHT ICS staffing figures

- Current figures show that on average 96.5% of elective lists are covered by an appropriately trained anaesthetic practitioner.

Obtetric cases using ICS figures

- Approx 400 cases from July 11 – Aug Dec 11
- Approx 100 cases processed
- Reinfused 50% (approx)
- 25% cases processed for training
- 25% not appropriate
- 2 Elective cases where ICS was not used for the above time frame
- Approx 60 emergency cases where ICS was not used
- Last three months have shown emergency cases not using ICS down to single figures on a monthly basis.

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4. ICS should be seen as part of a Blood Conservation program

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Key benefits of Introducing a Blood Conservation service

- Reduced risk for patients and improved patient care
- Reduced demand on blood banks and associated costs
- Reduction in last minute cancelled operations
- Reduced risk of peri-operative operative complications leading to reduce length of stay.

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RCHT Blood Conservation Service

- Optimisation – Pre surgery
- Intra Operative Cell Salvage
- Quality assurance
- Point of care testing
- Research
- Advice
- Audit
- Total Cost Service?

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5. Teams should consider following up patients, to evaluate the risk of alloimmunisation

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Patient Follow up's

- Re infusion data entered into data base
- Letter to GP and patient
- Patient asked to make appointment for follow up bloods.
- Full antibody screen
- Data entered onto database
  - Current data shows approx **<u>36%</u>** follow up!!

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6. Teams should consider implementing a Quality Control program, when offering an ICS service

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What is Quality Control?

- Quality control (QC) is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria or meets the requirements of the client or customer
- In order to implement an effective QC program, an enterprise must first decide which specific standards the product or service must meet
- the QC process must be ongoing to ensure that remedial efforts, if required, have produced satisfactory results and to immediately detect recurrences or new instances of trouble.

QA Samples

- Full Blood Count (Hb/Hct)
  - Marker of quality of blood returned to patient
- Micro-albumin
    - Marker of washing efficiency
- Heparin testing
  - Marker of washing efficiency and to ensure blood returned to patient is not grossly contaminated with heparin
- Plasma free Hb
    - Not compulsory if equipment not available

ICS Obstetrics at RCHT

- Routinely used for all sections – elective and emergency
- Dedicated machine
- Tx rates decreasing
- Patients have to opt out not in – IOCS built into consent form
- Further research??

Remember

"Minimise the need for allogeneic transfusion, and maintain or improve the probability of a good clinical outcome, but don't forget: transfusion has risks, but bleeding to death is fatal"

(McClelland, Brian: A manual for blood conservation2005)