Mother, Babies and Blood
South West Regional Study Day
28th Jan 2015
Obstetric Cell Salvage

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Royal Cornwall Hospital

What is Patient Blood Management?

Patient blood management (PBM) views a patient's own blood as a valuable and unique natural resource that should be conserved and managed appropriately.

PBM is a multidisciplinary, multimodal, evidence based, patient centred approach to optimising, conserving and managing the patient's own blood.

PBM puts the patient at the centre of decisions made about transfusion

Patient Blood Management – The Future of Blood Transfusion

A joint initiative with The Department of Health and The National Blood Transfusion Committee

Blood Matters: doing nothing is not an option

Sir Bruce Keogh, *NHS Medical Director*

What is being done?

A panel of experts and influencers in the field are being invited to consider international best practice and what can be done to ensure a Patient Blood Management approach is adopted across England and North Wales

Sustainability of the blood supply

While the demand for red cells is stable, the demand for platelets increased by 8% in the last year. The recent increase in the use of platelets is projected to continue due to a number of factors such as medical advances and an aging population. Only 4% of the eligible population give blood, and new donors are always needed to replace regular donors who can no longer donate.

Six Key Points

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

Intraoperative Cell Salvage in the Emergency Situation

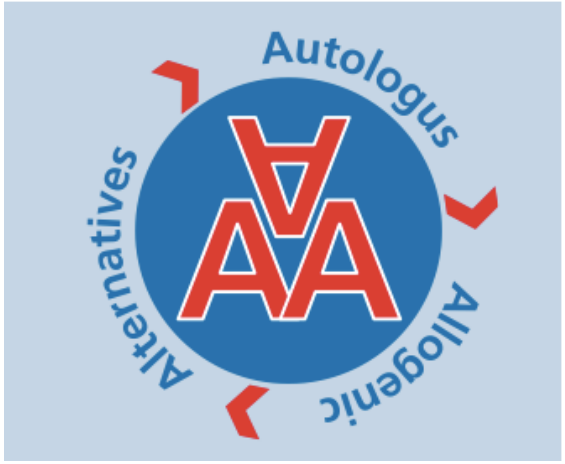
When used in unfamiliar / emergency situations, cell salvage may lead to a poor outcome! Resulting from lack of knowledge and confidence in the equipment, therefore producing a reduced quality end product?

RCHT - Three "A" Principal (PBM)

Alternatives – Algorithms supporting transfusion, Intravenous Iron, erythropoietin

Autologous – Intra/post operative Cell Salvage

Allogeneic - Appropriate transfusion



Blood Conservation Service Pledge
Royal Cornwall Hospital

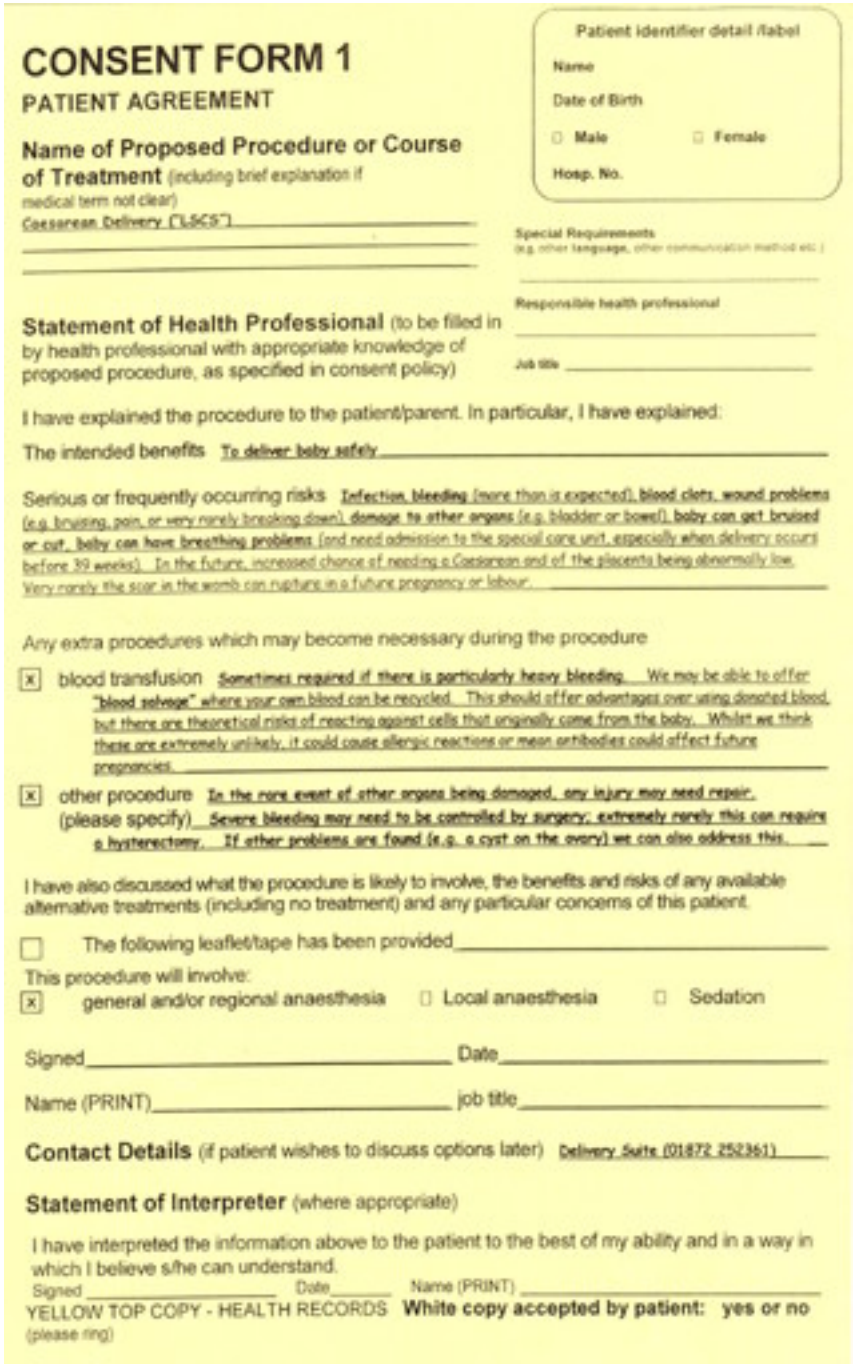
The Royal Cornwall Hospital employs and supports a patient blood management programme.

Background

Since 2003 Blood Conservation strategies have been implemented within the Royal Cornwall Hospital to support the reduction of allogeneic (donor) blood transfusion peri-operatively. Initially focussed on conserving blood during orthopaedic surgery, the service has since expanded to include all surgical specialities, and evolved into a Patient Blood Management Programme.

The current blood management programme aims to reduce the consumption of allogeneic blood in the surgical setting, in the following ways

1. Optimise patients' Hb (blood count) levels before surgery.
2. Use appropriate cell salvage techniques to collect patients' own blood for re-infusion peri-operatively.
3. Implement a comprehensive blood conservation, competency based training program for all staff involved in cell salvage and blood conservation.
4. When indicated, support the use of blood transfusions, ensuring that updated and current practice is employed and patient consent is sought whenever possible.
5. Educate staff to always consider the use of alternatives to blood transfusion when appropriate.
6. Monitor the use of cell salvage, audit interventions, collect and disseminate data relating to blood conservation.
7. Undertake research and publish outcomes in relevant areas of blood conservation



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

[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.

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:

[x] 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)

Standard Consent Form for C/S

Patients have to Opt out not in!

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.

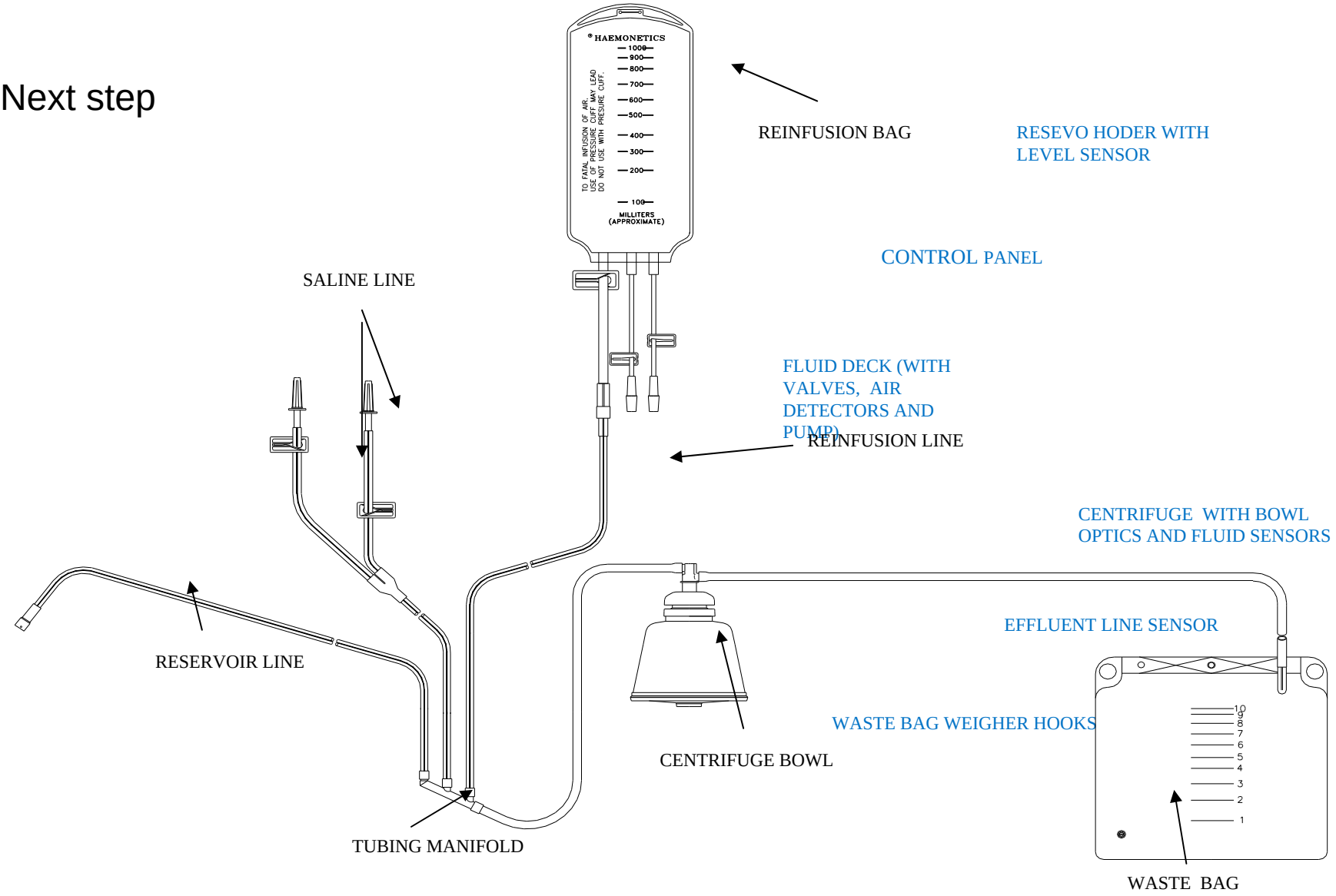
[X] other procedure (please specify) **In the rare event of other organs being damaged, any injury may need repair. Severe bleeding may need to be controlled by surgery; extremely rarely this can require a hysterectomy. If other problems are found (e.g. a cyst on the ovary) we can also address this.**

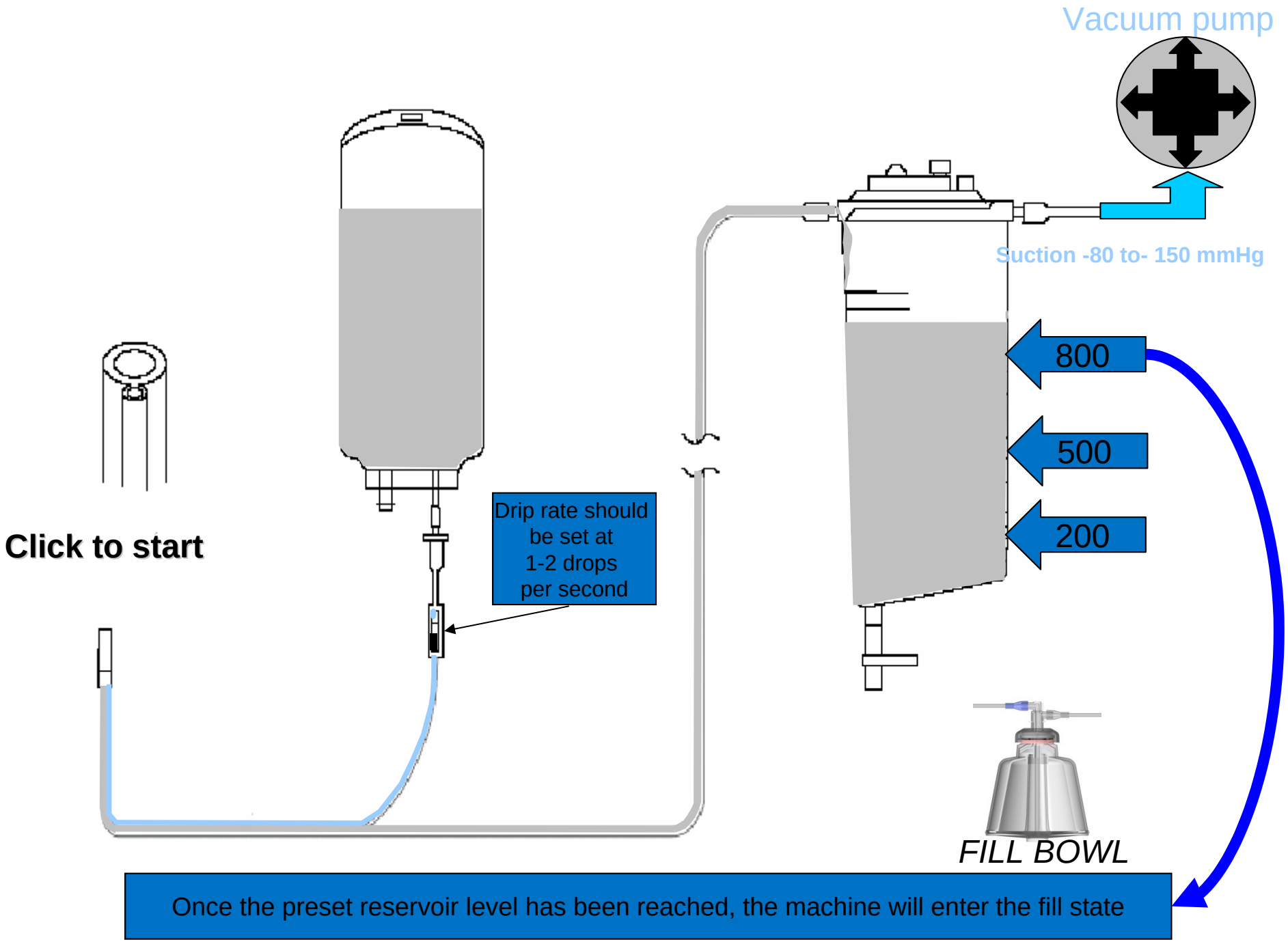
Cell salvage How Does it Work ?

Haemonetics
Cell Saver 5+

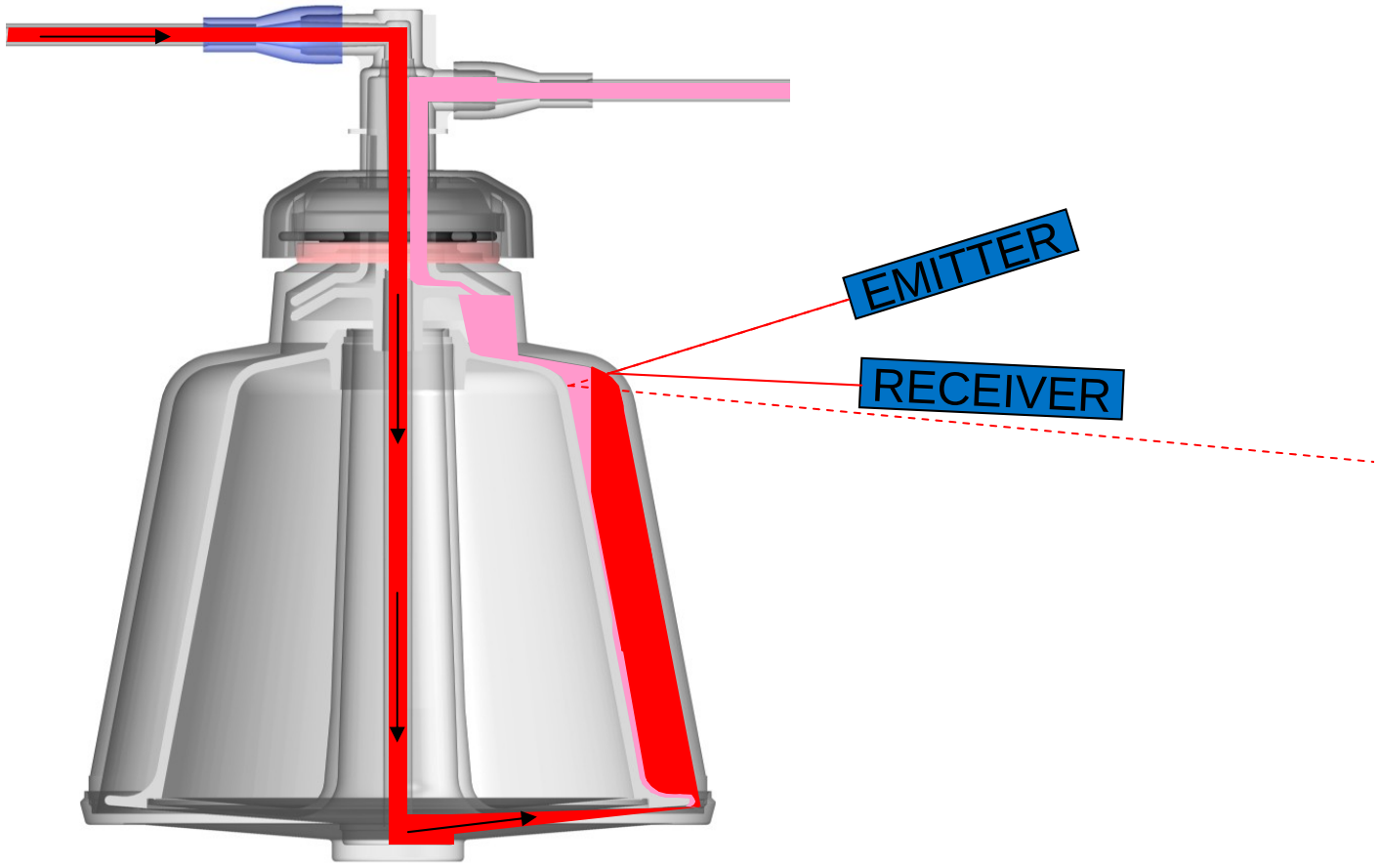
Intraoperative Cell Salvage Disposable set

Next step

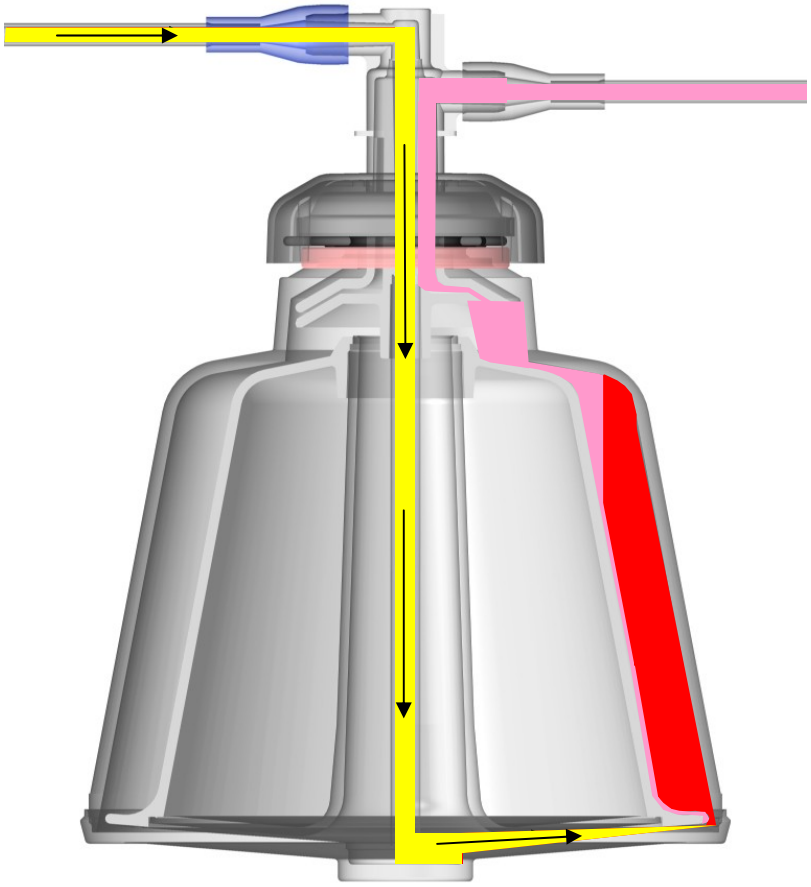



Vacuum pump
Suction -80 to- 150 mmHg
800
500
200
Click to start
Drip rate should be set at 1-2 drops per second
FILL BOWL
Once the preset reservoir level has been reached, the machine will enter the fill state

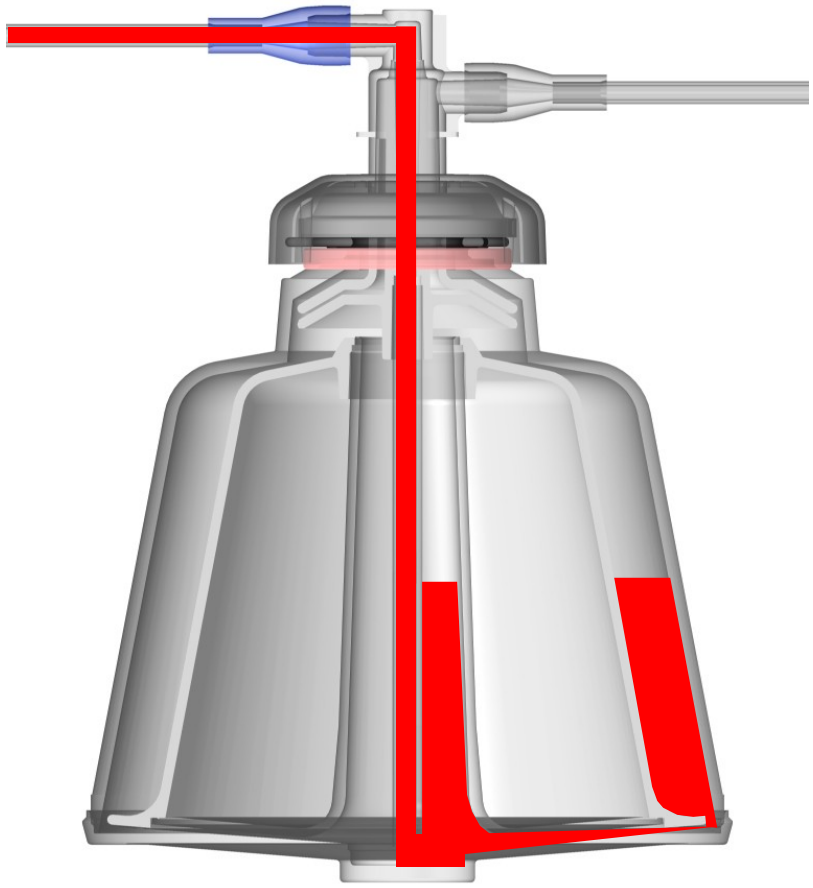
Fill Cycle



Washing Cycle



Empty Cycle



Intraoperative Cell Salvage at RCHT in maternity from 2011

- Routine collection of blood to cell saver- not targeted to high risk cases
- Usage increased to over 90% by end 2011, 95% 2012, 96% 2013 and >98% so far 2014
- Competency based training for all anaesthetic assistants
- Blood processed in 1/3rd all collections and only when adequate volumes collected
- Re-infusions offered to all women
- Invited for 4 - 6 month follow up

Risks and benefits

RISKS

Amniotic fluid embolism

Fetal red cell contamination and risk of alloimmunisation

Use 1 suction device

BENEFITS

Autologous blood

Avoid or reduce allogeneic blood consumption

Alloimmunisation

- Fetal red cell contamination in cell salvage blood
- Transplacental haemorrhages result in maternal contamination
- Clinically significant antibodies other than anti-D
- Incidence of antibody formation unknown
- Follow up 4-6 months post re-infusion

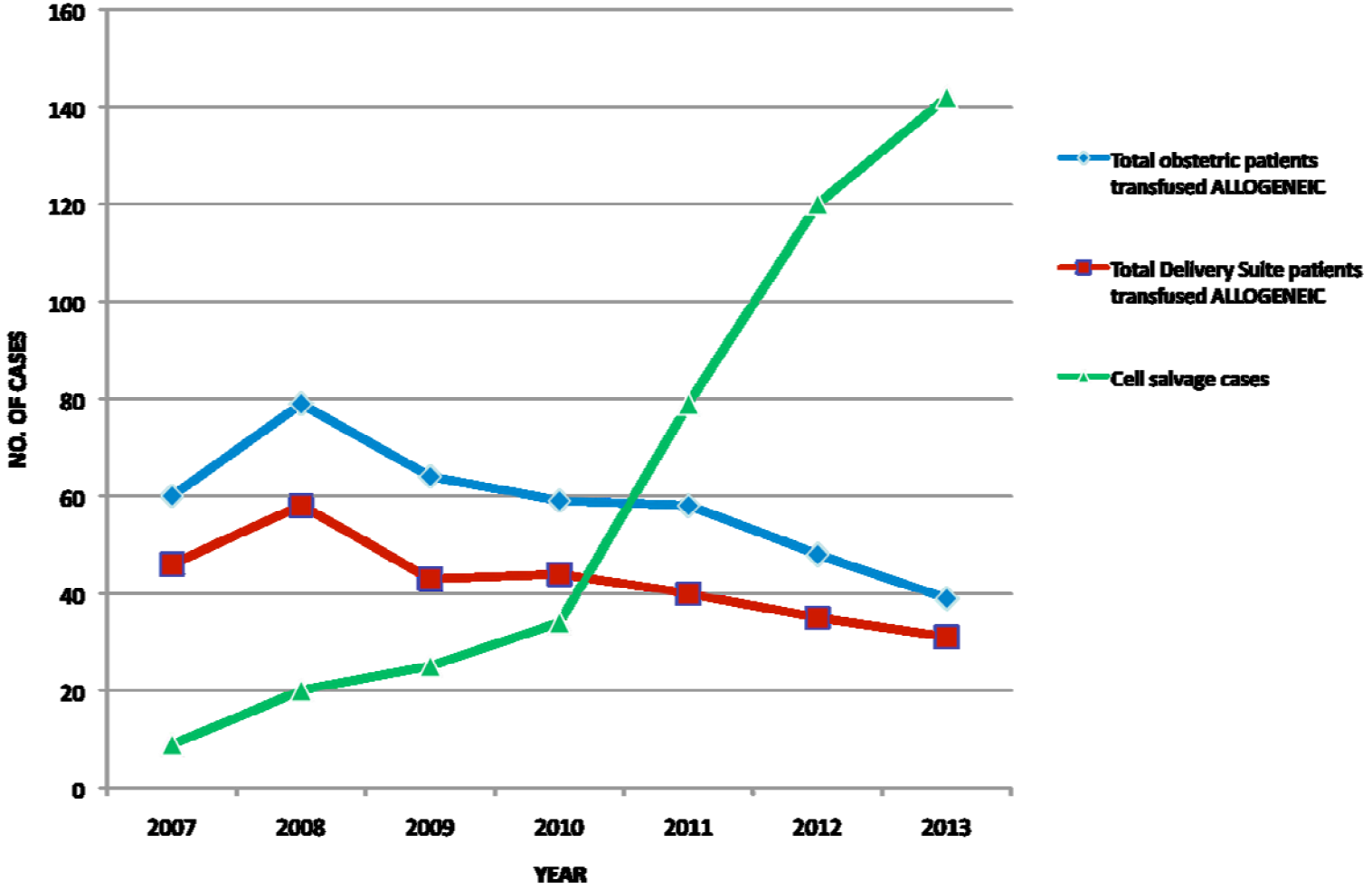
Results 2014

- Service established as routine
- 853/869 = 98% of cases had blood collected
- 30% processed (226 cases)
- 146 women were re-infused (64% of processed collections)
- Average volume 221 mls
- Follow up cases 2014 - ?
- New Abs detected

Transfusion/ ICS rates

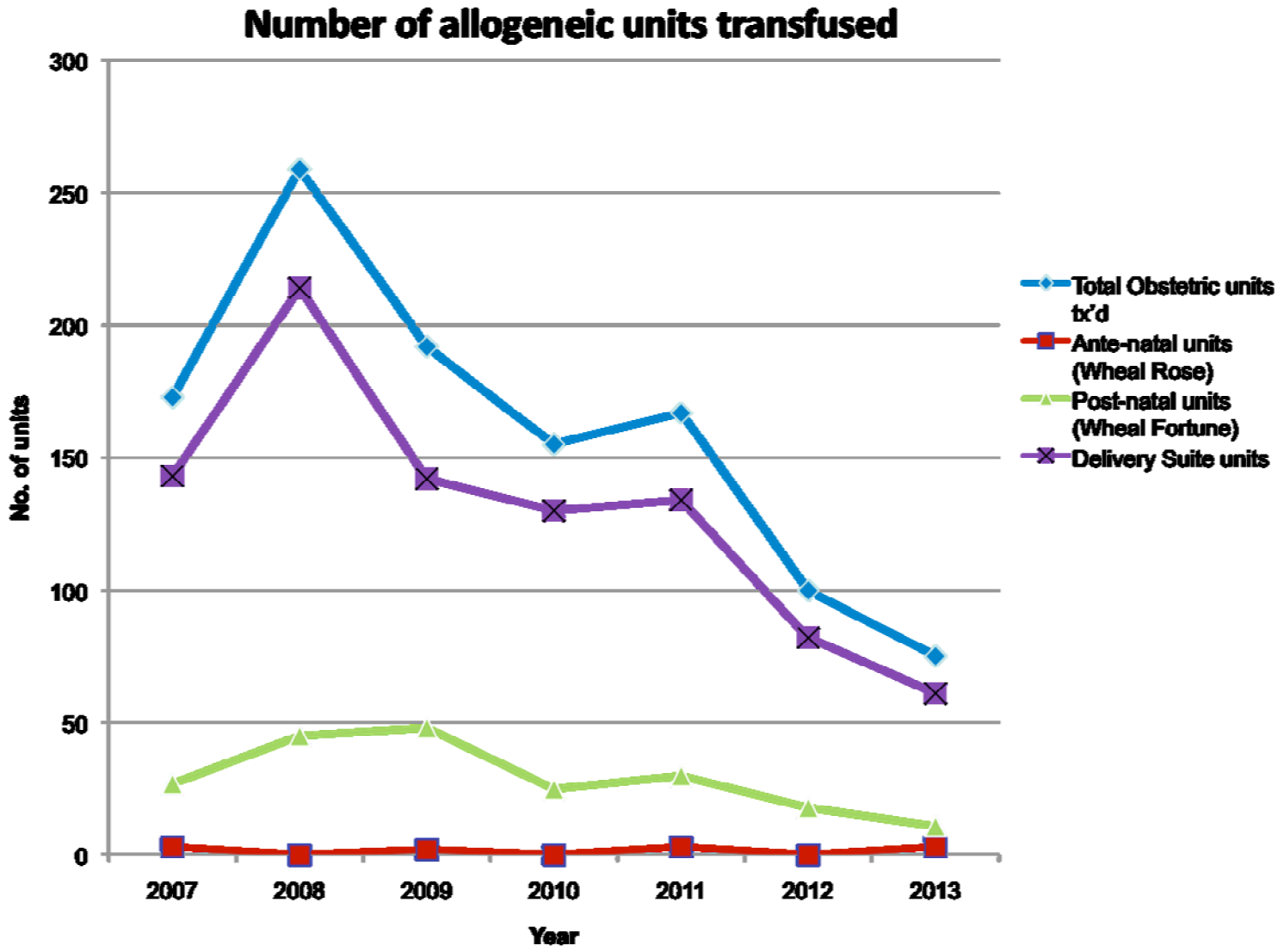
	2007	2008	2009	2010	2011	2012	2013
Total obstetric patients – allogeneic tx's	60	79	64	59	58	48	39
Del Suite patients – allogeneic tx's	46	58	43	44	40	35	31
ICS cases	9	20	25	34	79	120	142

Allogeneic and autologous transfusions



Number of units transfused in Obstetrics

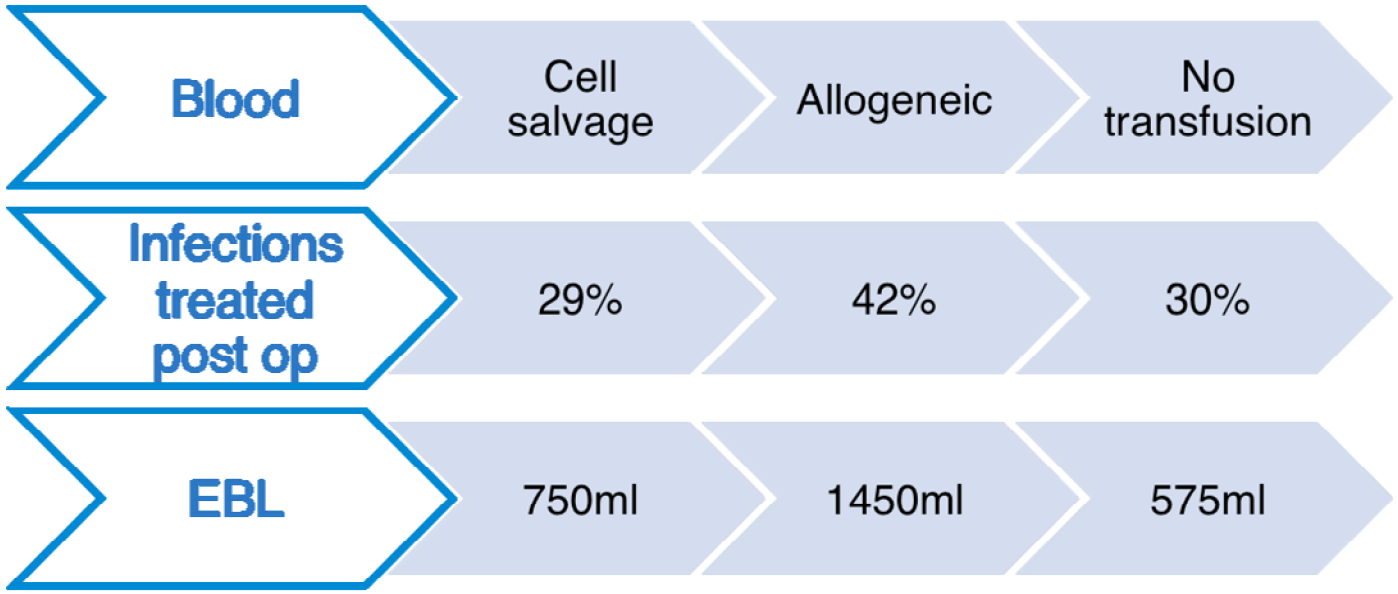
	2007	2008	2009	2010	2011	2012	2013
Total Obstetric units tx'd	173	259	192	155	167 (-45)= 122	100	75
Ante-natal units	3	0	2	0	3	0	3
Post-natal units	27	45	48	25	30	18	11
Delivery Suite units	143	214	142	130	134	82	61


Number of allogeneic units transfused
300
250
200
150
100
50
0
No. of units
2007
2008
2009
2010
2011
2012
2013
Year
Total Obstetric units tx'd
Ante-natal units (Wheal Rose)
Post-natal units (Wheal Fortune)
Delivery Suite units

Obstetric transfusion rate per delivery

	2008	2009	2010	2011	2012	2013
No of deliveries in Cornwall	4349	4354	4428	4688	4628	4612
Obstetric patients tx'd per delivery (%)	1.8	1.5	1.3	1.2	1.0	0.8
Delivery Suite patients tx'd per delivery (%)	1.3	1.0	1.0	0.9	0.8	0.6

Treated for infection



Reasons salvaged blood is not reinfused back?

Two main Reasons

- Partial Bowls
- Patients decline – WHY?

- Misunderstanding?

Benefit of ICS in Obs

- Reduction in Tx rate seen from 2008.
- Cost consumables (processing)
- Partial bowls – use of LDF – reduce costs further
- Reduction in costs of producing blood and treatment ATR
- Reduction in post operative infections, readmissions and potentially LOS
- Future....less risk of exposure to mothers of infection from emerging pathogens

Conclusion

The present

- The routine use of ICS in the maternity operating theatre is part of RCHT's blood conservation strategy.
- Autologous blood is a suitable and safe alternative to allogeneic blood.
- Using autologous blood has reduced the number of units used and % women who have received donor blood.
- Using ICS routinely in maternity saves money

The future

- Establish the incidence of antibody formation following re-infusions from IOCS.
- ?Salvage and re-infuse vaginal blood

Thank You To The
Patient Blood Management Team
At RCHT

- **Dr C Ralph**
- **Mr I Sullivan**
- **Carol McGovern**

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