Blood Conservation at Royal Cornwall Hospital – The Story so Far!

Mr John Faulds
Blood Conservation Co-ordinator

Outcome for Today

To show how we have implemented a program of Surgical Blood Conservation, with the aim of reducing blood Tx in the surgical setting.

Moving from a total cost service to income generator

Challenges Faced

The Future

Challenges for Blood Conservation

Reduce Tx?

Decrease length of stay?

Financially viable?

Cultural Change?

Why Blood Conservation at RCHT?

Primary aim to reduce the need for red blood cell transfusion in those patients where transfusion can be avoided through the use of other treatment/interventions modalities and interventions'

To support Dr Lars Jakt in his vision!!

Business Case 2009 approved

How was this achieved?

- Trust invested in Blood Conservation as real alternative.
- IOCS integrated into Job Descriptions of Operating Department Practitioners
- Ethical research – contamination of salvaged maternal blood by amniotic .uid and fetal red cells during elective Caesarean section, BJA 2008
- Implementing Government guidelines – SHOT, NICE, BBT3
- Further ethical Research – New Obstetric paper Investigating Alloimunisation 2011- Intraoperative Cell salvaged blood and its use as part of a blood conservation strategy in Obstetrics – Is fetal red cell contamination important?

Pre Blood Conservation

- Pre 2002
- Very Limited ICS
- No Optimisation
- Transfusion rates in THR

Blood usage between RCHT and St Michaels

THR 2002 47%

Blood Tx cost's £98,700 (THR)

Length of stay – 7, 10, 12 ??? days

The Team

- Dr Cathy Ralph – Clinical Lead
- Dr Lars Jakt – Clinical Lead
- John Faulds – Blood Conservation Coordinator
- Carol McGovern – BC Practitioner
- Sara Staddon – BC Practitioner
- Karen Barclay - Administrator
    - Ian Sullivan - BMS

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.

Surgical Blood Conservation

- **BLOOD CONSERVATION IN ELECTIVE ORTHOPAEDIC SURGERY** - British Orthopaedic Association, April 2005

  - Pre-operative assessment and optimisation
  - Intra-operative blood conservation, and cell salvage
  - Post-operative conservation, including indications for transfusion, and postoperative cell salvage

"Good transfusion management should be viewed as good management of the patient who is at risk of transfusion (Ref. 1). Success is to transfuse only when the benefits outweigh the risks. Good practice implies that measures to prevent or pre-empt the need to transfuse should be fully utilised. This statement embraces many aspects of routine clinical management as well as the use of specific blood conservation measures"

Hill, S.R., Carless, P.A., Henry, D.A., Carson, J.L., Hebert, P.C., McClelland D.B.L. & Henderson, K.M. (2002) Transfusion thresholds and other strategies for guiding allogeneic red blood cell transfusion. *Cochrane Database Syst Review*, **2**, CD002042.

The Three Pillars of Multidisciplinary Multimodal Patient Blood Management

Medical Society for Blood Management

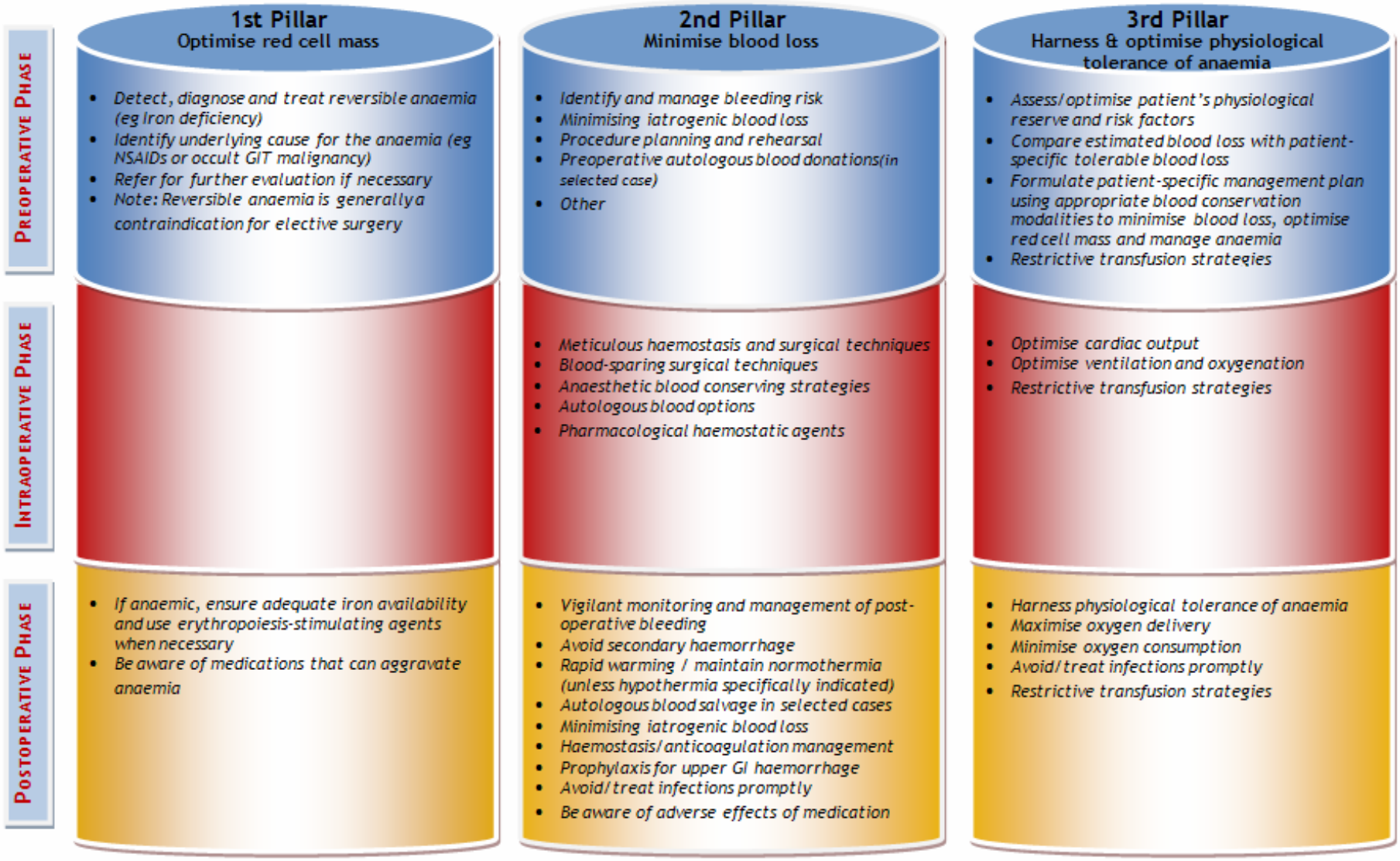


Figure courtesy of the Western Australian Patient Management Program from a presentation given by Dr Simon Towler, Chief Medical Officer, WA Department of Health

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 and patient centred approach to optimising, conserving and managing the patient's own blood. It aims to identify patients at high risk of transfusion and provide a management plan aimed at reducing the need for blood transfusion and improving patient outcomes.

Patient blood management

- Anaemia management to optimise the red cell mass
- Minimise blood loss
- Tolerance of anaemia (appropriate transfusion decision and optimising the

patient’s physiological tolerance of anaemia).

The Service

- Optimisation – Pre surgery
- Intra Operative Cell Salvage
- Quality assurance
- Point of care testing
- Research
- Advice

- Audit
- Total Cost Service?

BBT3 2007

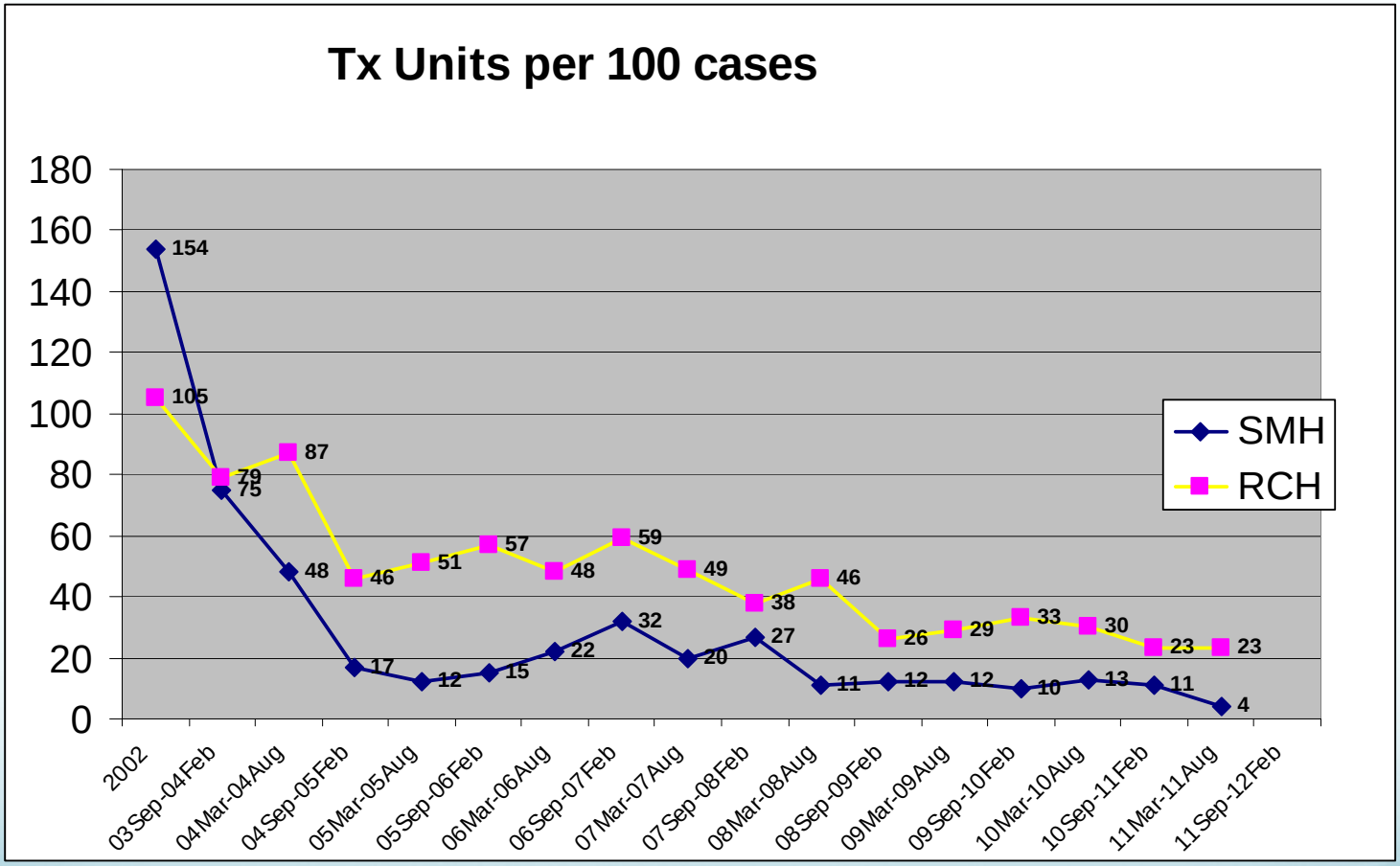
Health Service Circular (HSC 2007/001) Better Blood Transfusion - *Safe and Appropriate Use of Blood*.

- **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

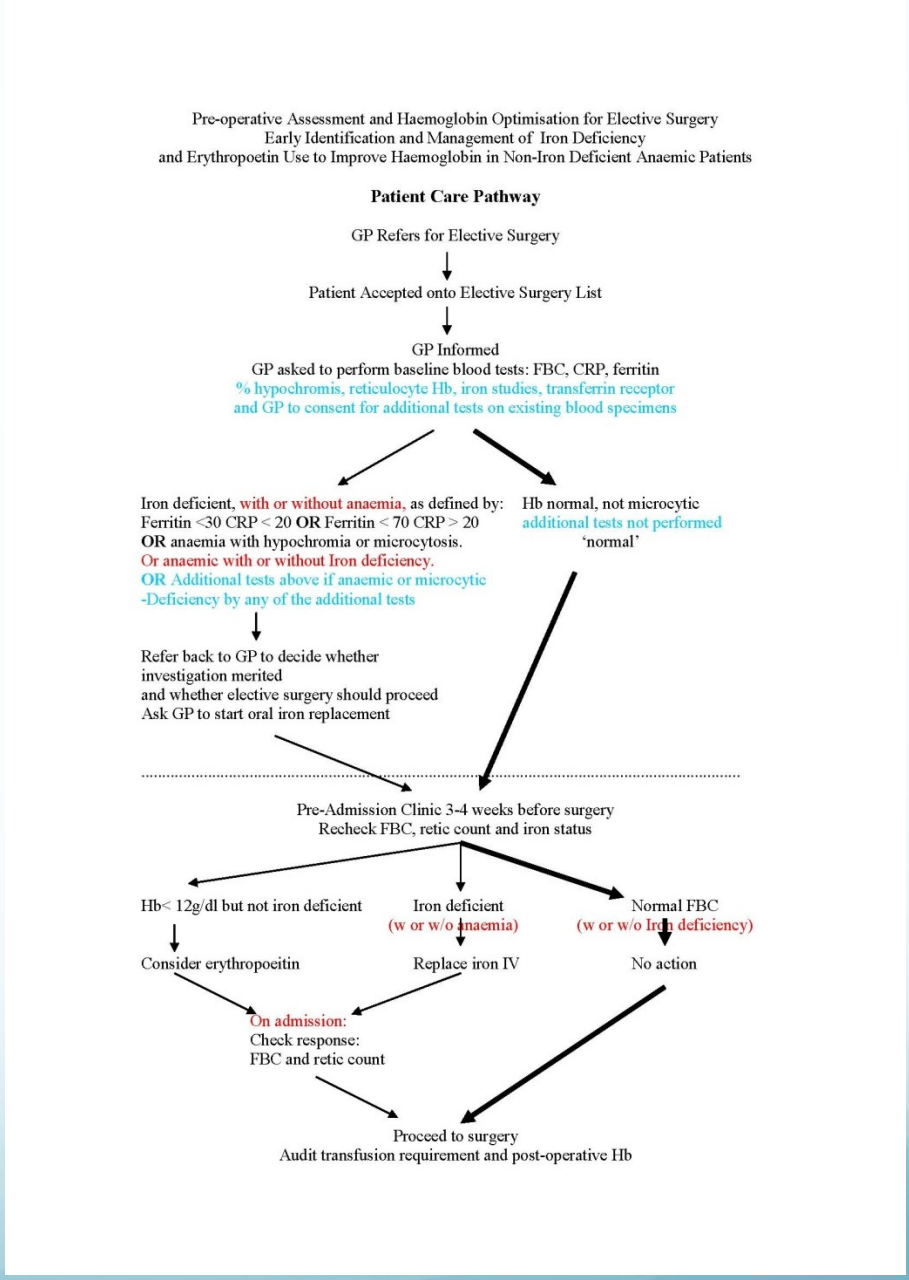
Time Line

- Pre 2002 = No Program
- Sep 04 – Aug 05 = ICS Program
- Mar 06 – Feb 07 = Change in ICS criteria which should an increase in Tx
- Mar 07 – Feb 08 ICS program re instated
- Feb 08 – To date = Optimisation program and ICS program

Time Line Graph

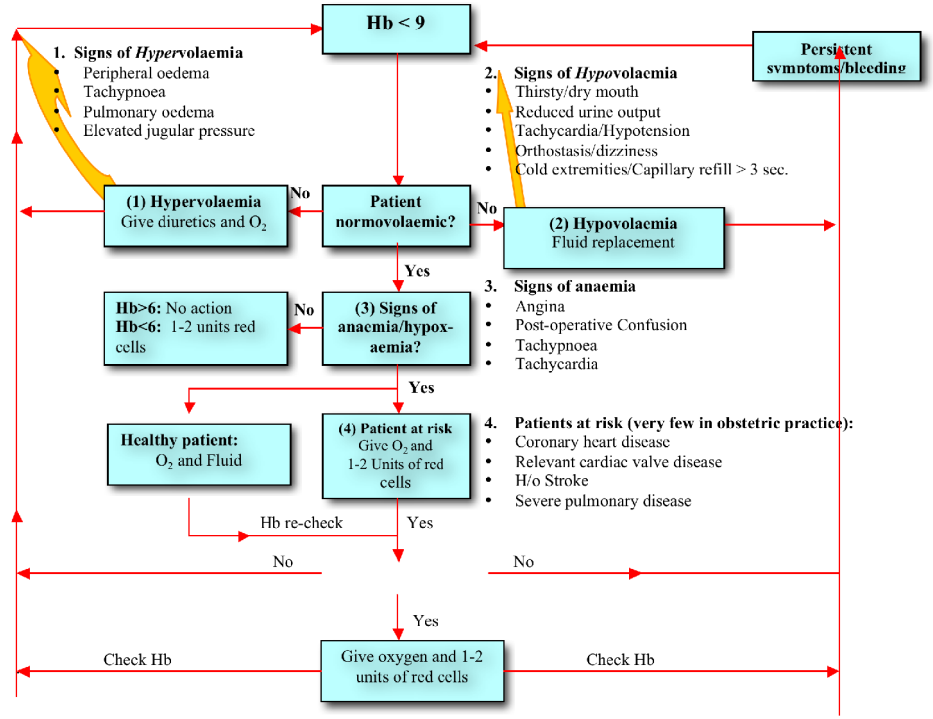


Referral Algorithm



Guidelines for blood transfusions in pregnancy.

- Ante-,peri and post partum management of fluid and blood status includes careful consideration of the need for red cells **and** other fluid replacement
- The patient's **volume status** needs careful assessment with special attention in pre-eclampsia.
- **Asymptomatic patients** with normo-volaemic anaemia **do not need blood transfusion** if the haemoglobin level is above 6 g/100ml
- All Hb levels referred to below are in gram per 100 mls



Note: High risk patients need special thresholds for red cell transfusion

Not an indication for transfusion:

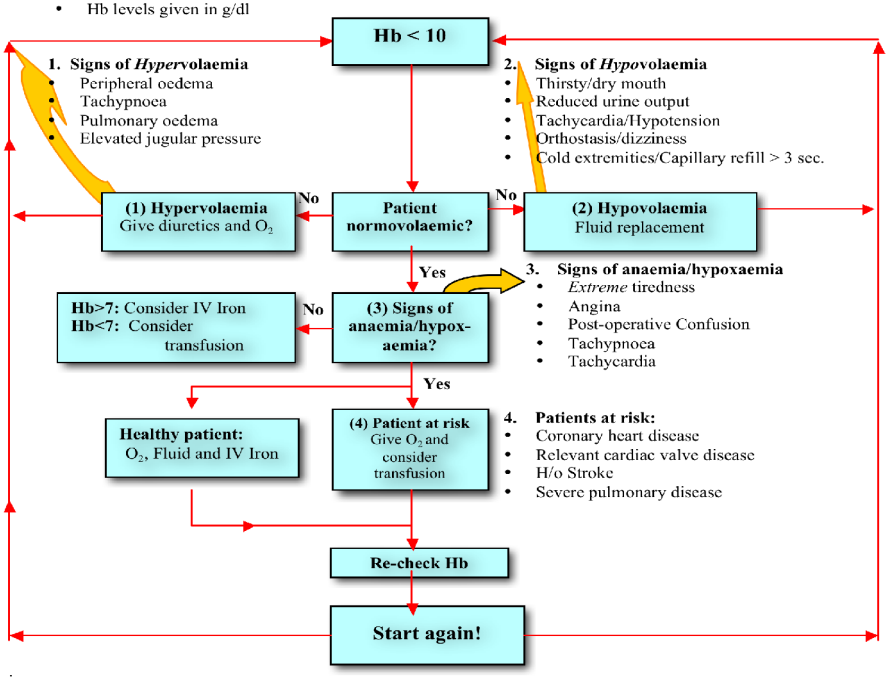
- Anaemia with patient **feeling well.**
- Prophylactic substitution
- Top up of HB in **asymptomatic** anaemia
- Hypovolaemia, i.e. use as plasma expander.

HTT August 2004.
Blood transfusion and the Anaesthetist 2 AAGBI June 08

Guidelines for peri-operative blood transfusions in adults.

(not suitable for acute massive haemorrhage)

- RCHT Blood transfusion policy states: **"Transfusion should only be given when there is no alternative"**
- Peri-operative management of fluid and blood status includes careful consideration of the need for red cells **and** fluid replacement
- The patient's **volume status** needs careful assessment.
- **Asymptomatic normal risk patients** with normo-volaemic anaemia **do not need blood transfusion** if the haemoglobin level is above 7 g/dl.
- **Don't give more blood than necessary to achieve the Hb-level you are aiming for.**
  - Calculate one g/dl Hb per unit of blood. **Single unit transfusion is perfectly acceptable.**
- **IV Iron** Sucrose, Venofer, 200 mg can increase Hb 1g/dl within a few days.of an acute bleed. Max 200 mg/day, max 600 mg/week.
- Hb levels given in g/dl



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REMEMBER
A blood transfusion will ban the recipient from donating blood!

Management of Hypovolaemia:

- Oxygen 2-4 l/min
- Fluid replacement/challenge with crystalloid (Hartmann's®), starch (Voluven®) or gelatine (Gelofucine®),

Lars Jakt/HTT August 2004.
Version 4
Revised Lars Jakt May 2010
To be revised May 2013

Patient pathway

- Patients flagged up by Pre assessment
- Blood results normally checked within two days
- Blood Conservation contacted –
  - Email
  - Telephone
  - In person
  - Netpage

Pre op iron choice

- Ferinject now the iron of choice pre surgery

  400mg 600 mg 1000mg

  +/-

  Darbepoetin 300 mcg

- Patient only has to attend once
- Follow up bloods – normally two weeks following iron
- Intervention outcome - HRG 4
  - **Patient discharged**

Delivery of Iron

- All Iron interventions are undertaken in the pre op assessment clinic
- Out patient setting
- Dedicated member of staff
- Iron given as slow IV infusion via Baxter pump
- One to one nursing

Follow up bloods

- Normally at two weeks
- Normally taken at GP's
- Maybe taken on admission (day of surgery)
- Require – FBC

  Reticulocyte's

  Ferritin (sometimes)

  CRP

Peri op Iron

- Iron Sucrose (Venofer) iron of Choice
- Iron given during surgery or immediately post operatively
- Undertaken by anaesthetists or recovery nurses
- Given as a slow IV bolus
- Offered to patients who have normal Hb low ferritin.

Post Operative Iron

- Iron Sucrose (Venofer iron of choice)
- Given within 24 hrs post
- Given by Baxter IV pump
- Patients flagged up at Pre assessment
- Follow up results in two weeks
- Letters to GP

Optimisation Costs + Income

- HRG 4
- Coded – QZ14B (Tariff of £199)
- Predicted yearly costs - £31,000 approx
- Predicted yearly income - £44,000 approx
- Income generation - £12,500 approx

Predicted on 218 interventions

ICS Training

- No longer “ see one , do one, teach one” now “competency training”.
- Endorsed by the UK Cell Salvage Action Group
- Skills for Health

ICS RCHT

- Dedicated trainer
- ODP’s operate machines as part of their anaes role

Future will see legislation with MHRA?

Training Issues

- Surgical interventions
- Staffing
- Sickness
- Cancellations

ICS Usage

April – Dec 2011

- OrthoPat – 369
- Electa – 340
- Cell Saver 5+ (Obs) - 502

  (Gen) – 16

Total – 1227 ICS cases

(Collection and processing)

ICS Training/Usage Cont

- Training sessions met
  - Average 75%
- Trained ICS staff allocated to lists
  - Average 96.4%

ICS Funding (PLICS)

- For the last year or so we have been using the PLICS (patient-level information and costing systems), which shows our ICS activity month on month within the trust and allows for appropriate funding of our service.

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.

Data

	Number Of cases	Mean wash volume (mls) Range	Mean RBC volume (mls) Range	Mean Haemoglobin (g/dL) Range	Mean Haematocrit (L/L) Range
Obstetrics	46	2834 1650 - 12000	292 115 - 782	14.0 7.2 – 21.4	0.419 0.209 – 0.620
Urology	27	2861 752 – 6498	438 121 - 850	15.1 9.6 – 24.1	0.474 0.302 – 0.659
Orthopaedics	22	3067 880 - 6546	329 55 - 585	16.2 7.4 – 26.2	0.490 0.281 – 0.744
Vascular	14	2755 1000 - 8023	804 237 - 4842	14.7 7.5 – 20.7	0.461 0.240 – 0.597
Gynaecology	3	2000 1000 - 3000	337 225 - 470	14.1 13.1 – 15.5	0.451 0.442 – 0.460
General	2	5429 3523 - 7334	498 244 - 752	15.5 14.4 – 16.6	0.490 0.485 – 0.494

Point of Care

- Point of care Hb testing – HemoCue (X5 analysers)
- Investigating - Haemostasis analyser (Rotem/TEG)

Research

- Dr Richard Noble – Looking at best diagnosis for IDA
- ICS
  - QA - Benzene Level
    - Vaginal Loss

Blood Conservation Budgets

- Total Budget for 2010 – 2011

  £191,000

- Total Budget for 2011 – 2012

  £216,000

- My Predicted Budget for 2012 – 2013

  Approx £280,000

- Quarter on Staffing costs this year

Evidence (To date)

- Transfusion Rates (THR)
  - 2% AT St Michaels
  - 5% overall
- Hb of 12 and ICS appears to reduce length of stay

Blood Conservation Future

- To integrate Blood Conservation into the wider trust objectives
- Consider moving from Blood Conservation to Patient Blood Management
- Increase in staff to support the service
- Further ethical research
    - Medical patients??