Blood Conservation

and the

HOSPITAL LIAISON COMMITTEE

for

Jehovah's Witnesses

Presented by Roy Jackson

www.jw.org

“Many of the techniques developed for use in Jehovah’s Witness patients will become standard practice in years to come in an effort to conserve blood stocks and reduce the need for transfusion”.

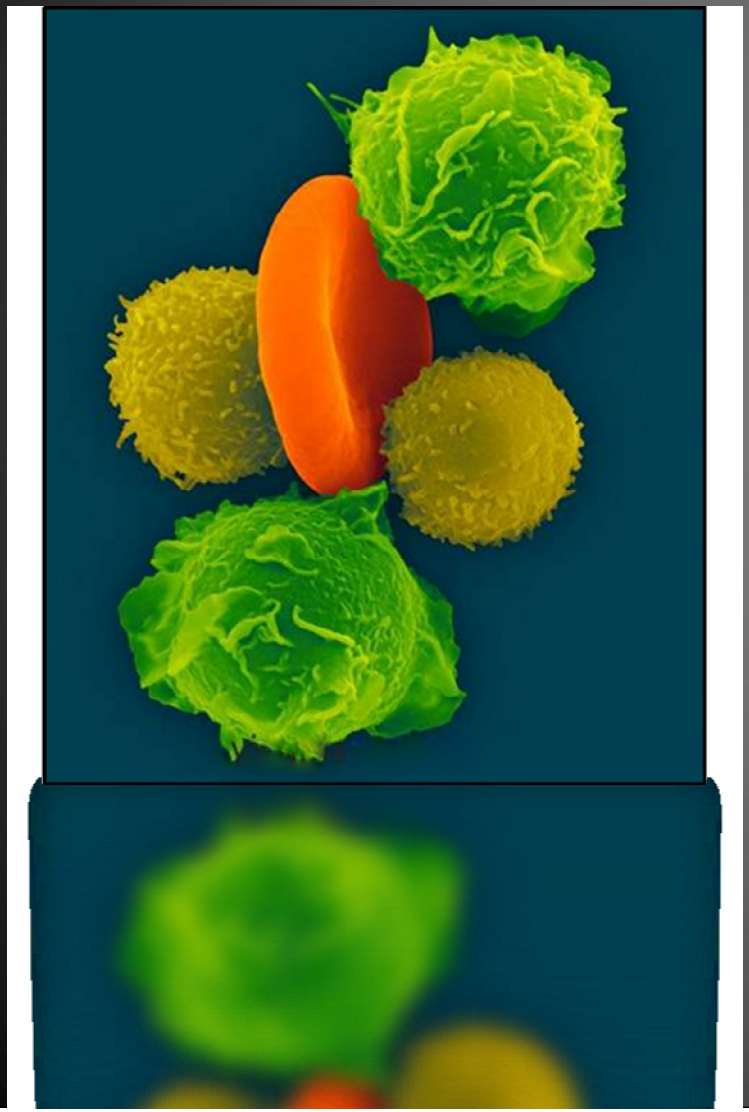
- Royal College of Anaesthetist’s Continuing Medical Education Journal

- Management of Anaesthesia for Jehovah’s Witnesses 2nd Edition, Concluding remarks, 2005

Points of Discussion

- The Jehovah's Witness Patient
- History on Bloodless Surgery
- HLC as a Resource –
- Patient Blood Management Document
- Clinical Strategies Booklets
- In Practice
- Questions

The Jehovah's Witness Patient



- Whole blood
- Packed Red cells
- White blood cells
- Platelets
- Plasma – FFP
- Blood Storage [PAD]

History on Bloodless Surgery

- Early data available on bloodless surgery was collected from Jehovah's Witness patients who refused transfusion.
- Dr Denton Cooley of Texas USA, known for performing the first implantation of an artificial heart into a person, performed the first bloodless open heart surgery on a JW patient in 1962.
- Fifteen years later he released a report of more than 500 cardiac surgeries that had been safely performed without blood transfusion.
- Since then Jehovah's Witnesses collaborated with some of the leading healthcare institutions in the US, like Englewood Hospital in NJ, who, in 1994, established bloodless medicine and surgery programs and protocols. This early work laid the foundation for the mainstreaming and acceptance of bloodless programs.
- In 2013 it was reported that there were over 150 bloodless medicine surgery centres in the US alone with many more in development.

History on Bloodless Surgery

- In the UK, the Better Blood Transfusion initiative was started in 1998. Over three editions direction was given to make use of techniques used in bloodless surgery, to reduce transfusions and subsequent morbidity and mortality, as documented by SHOT.

- **“Ensure that mechanisms are in place for the pre-operative assessment of patients for planned surgical procedures to allow the identification, investigation and treatment of anemia and the optimisation of haemostasis.” BBT3 Page 8**

- In 2012 BBT was superseded by Patient Blood Management.

HLC a resource
A Patient Blood Management document

Planning Surgery

"In view of the range of individual choice displayed by patients who are Jehovah's Witnesses, it is essential to establish ahead of time their personal views regarding the use of blood, blood products and autologous transfusion procedures, for any of these that might be applicable in their treatment/surgery." (Better Blood Transfusion Toolkit, Appropriate Use of Blood, www.transfusionguidelines.org.uk)

Correct anaemia

Oral or IV iron
Folic acid
Vitamin B_{12}
Minimize blood sampling
Treat menorrhagia
Erythropoiesis Stimulating Agents (ESAs)

Correct clotting abnormalities

Review NSAIDs, warfarin, antibiotics, etc.
(When appropriate, in advance of the operation, change these for drugs without anticoagulant effects, or with a shorter half-life, such as low molecular weight heparin, thus allowing intraoperative management.)
Vitamin K
Protamine
Consider haemostatic agents
Check Coagulation Profile

Patient's Medical History

Examine patient's notes
Ask patient about bleeding abnormalities
Ask patient about circulatory problems

During Surgery

Not all of these options may be available, or acceptable to the patient. However, the treating team should be satisfied, before agreeing to perform an elective procedure, that they can handle predictable blood loss, or they should refer to a more specialized centre. (As per guidelines of Royal College of Surgeons, points 8 and 17, and Association of Anaesthetists, points 4.1.2 and 4.1.6.)

Techniques to minimize blood loss

Meticulous haemostasis
Haemostatic dissecting devices (such as laser, argon beam, microwave, ultrasonic, etc.)
Radiology guided arterial occlusion (pre- or intraoperative)
Minimally invasive procedures
Stereotactic radiosurgery
Enlarged surgical team—shorter operation
Surgical positioning
Intraoperative blood salvage *
Staging of complex procedures

Anaesthetic

Hypotensive anaesthesia
Normovolemic/hypervolemic haemodilution *
Full near-patient monitoring (TEG, HemoCue)
Artificial oxygen carriers
Tolerance of anaemia
Maintain normothermia

Haemostatic agents

Topical – surgical adhesives, tissue sealants *
Injectable – Tranexamic acid, desmopressin, vitamin K
Other – conjugated oestrogens, cryoprecipitate,* prothrombin complex concentrates,* recombinant factor VIIa, vasopressin

* Check on acceptability with patient (see over)

After Surgery

In addition to the relevant intraoperative strategies, consider, as appropriate, the following.

Blood Salvage

Wound drainage and reinfusion after filtration *

Anaemia

Oxygen support
Erythropoiesis Stimulating Agents (ESAs)
IV iron
Folic acid
Vitamin B_{12}
Prophylaxis of infection
Minimize phlebotomy – microsampling, sample multi-testing
Hyperbaric oxygen

For Bleeding

Radiology guided arterial occlusion
Prompt re-operative surgery
Direct pressure
Elevate body part above level of heart
Haemostatic agents
Tourniquet
Controlled hypotension

For Shock

Trendelelburg/shock position (patient supine with head lower than legs)
Medical antishock trousers (M.A.S.T.)
Appropriate volume replacement after bleeding controlled

Monitoring and Observation

Enhanced schedule to detect haemorrhage quickly *

* Check on acceptability with patient (see over)
* Directive from National Patient Safety Agency

Care Plan

for Surgery in Jehovah's Witnesses

To assist in communicating the patient's choices to the clinical team

Patient Blood Management
Pre-operative planning

Correct anaemia

Oral or IV iron
Folic acid
Vitamin B_{12}
Minimize blood sampling
Treat menorrhagia
Erythropoiesis Stimulating Agents (ESAs)

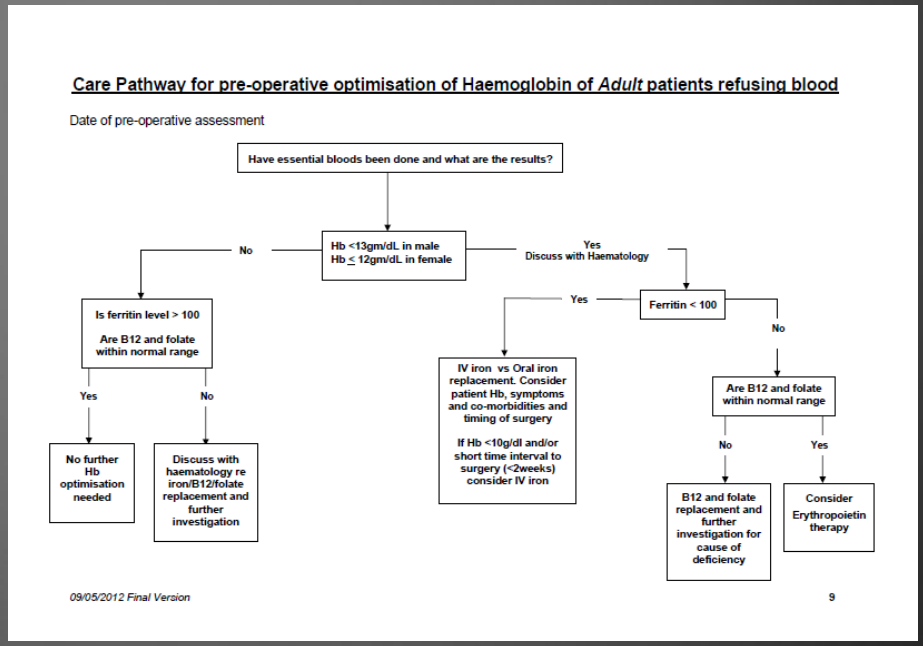
Correct clotting abnormalities

Review NSAIDs, warfarin, antibiotics, etc.
(When appropriate, in advance of the operation, change these for drugs without anticoagulant effects, or with a shorter half-life, such as low molecular weight heparin, thus allowing intraoperative management.)
Vitamin K
Protamine
Consider haemostatic agents
Check Coagulation Profile

Patient's Medical History

Examine patient's notes
Ask patient about bleeding abnormalities
Ask patient about circulatory problems

- Correct Anaemia – by means of Oral or IV Iron and ESAs.
- Check Ferritin levels
- EPO
- Correct Clotting Abnormalities
- Minimize Blood Sampling



Patient Blood Management After Surgery

Blood Salvage
Wound drainage and reinfusion after filtration *

Anaemia
Oxygen support
Erythropoiesis Stimulating Agents (ESAs)
IV iron
Folic acid
Vitamin B_{12}
Prophylaxis of infection
Minimize phlebotomy – microsampling, sample multi-testing
Hyperbaric oxygen

For Bleeding
Radiology guided arterial occlusion
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Monitoring and Observation
Enhanced schedule to detect haemorrhage quickly #

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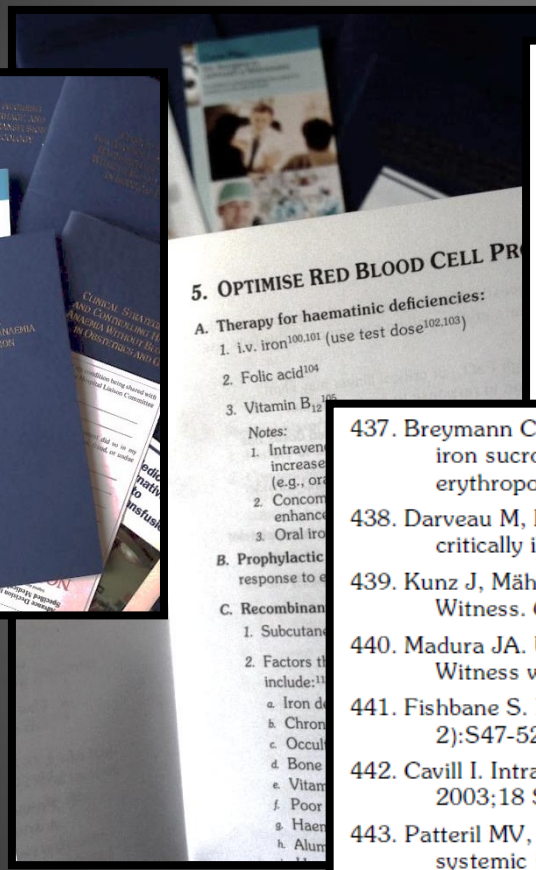
* Check on acceptability with patient (see over)
# Directive from National Patient Safety Agency

- Blood Salvage
- ESAs and IV Iron
- Oxygen Support
- Minimise Blood Tests
- Hyperbaric Chamber

Patient Blood Management
Clinical Strategy Booklets


5. Optimise Red Blood Cell Pr

A. Therapy for haematinic deficiencies:

1. i.v. iron[100,101] (use test dose[102,103])
2. Folic acid[104]
3. Vitamin B_{12}[105]

Notes:

1. Intraven increase (e.g., ora
2. Concom enhanc
3. Oral iro

B. Prophylactic response to e

C. Recombinan

1. Subcutan
2. Factors t include:[11]
   a. Iron d
   b. Chron
   c. Occul
   d. Bone
   e. Vitam
   f. Poor
   g. Haem
   h. Alum

B. Iron Replacement and Haematinic Support

1. Iron replacement
   a. Functional or absolute iron deficiency is a common cause of limited response to erythropoietin
   b. Virtually all patients will require supplementary iron therapy to maximize response to multiple-dose erythropoiesis stimulant therapy.[435,436] Parenteral iron should be considered if oral iron fails to support accelerated erythropoiesis[437-440]

Notes:

1. There is evidence to suggest that iron may be safely administered to critically ill patients receiving erythropoietic agents to support erythropoiesis.[441-443] Patients at high risk of bacterial infection should

437. Breymann C, Richter C, Huttner C, et al. Effectiveness of recombinant erythropoietin and iron sucrose vs. iron therapy only, in patients with postpartum anaemia and blunted erythropoiesis. *Eur J Clin Invest* 2000;30(2):154-61. [PMID: 10651841]

438. Darveau M, Denault AY, Blais N, Notebaert É. Bench-to-bedside review: iron metabolism in critically ill patients. *Crit Care* 2004;8(5):356-62. [PMID: 15469598]

439. Kunz J, Mähr R. Management of severe blood loss after tumor resection in a Jehovah's Witness. *Gynakol Geburtshilfliche Rundsch* 1995;35(1):34-7. [PMID: 7727972]

440. Madura JA. Use of erythropoietin and parenteral iron dextran in a severely anemic Jehovah's Witness with colon cancer. *Arch Surg* 1993;128(10):1168-70. [PMID: 8215878]

441. Fishbane S. Review of issues relating to iron and infection. *Am J Kidney Dis* 1999;34(4 Suppl 2):S47-52. [PMID: 10516376]

442. Cavill I. Intravenous iron as adjuvant therapy: a two-edged sword? *Nephrol Dial Transplant* 2003;18 Suppl 8:viii24-8. [PMID: 14607997]

443. Patteril MV, Davey-Quinn AP, Gedney JA, et al. Functional iron deficiency, infection and systemic inflammatory response syndrome in critical illness. *Anaesth Intensive Care* 2001;29(5):473-8. [PMID: 11669426]

444. Van Wyck DB, Cavallo G, Spinowitz BS, et al. Safety and efficacy of iron sucrose in patients sensitive to iron dextran: North American clinical trial. *Am J Kidney Dis* 2000;36(1):88-97. [PMID: 10873877]

Blood Conservation – In Practice

- Phone call for HLC assistance at 1.30am 17/10, 29yr old Male involved in a Motorbike RTA.
- Over the course of 4 surgeries, he endured a fall in hb to 3.5, had a number of kidney dialysis sessions, a lower leg amputation, ileostomy and laparotomy
- First surgery involved cell salvage which enabled him to have a second surgery a day and half later.
- EPO and IV Iron were prescribed as per the hospital protocol and the patient was kept sedated and stable for a just under 2 weeks.

Blood Conservation – In Practice

"Bloodless surgery has come to represent good practice, and in the future, it may well be the accepted standard of care."

-American Journal of Otolaryngology -
Adelola et al, Limerick Ireland 2008

Patient blood management (PBM) has recently been described as a concept pre-empting and significantly reducing the resort to transfusions by addressing anaemia, blood loss, and hypoxia as modifiable risk factors that may result in transfusion long before transfusion may even be considered.

Spahn: *PBM is a Win-Win* BJA 108(6), 889-92 (2012)

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Thank you

Questions are welcome

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