Non-Medical Authorisation Course

TRANSFUSION ALTERNATIVES

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STOP

Aims

- Why we need to consider alternatives?
- What alternatives are there?

Risk

Infection – Reaction – Errors – Death

Supply reducing !

Patient choice

Patients do refuse blood, for various reasons:

Jehovah's Witness patients

- Due to personal belief
- Refuse Red cells (sometimes Platelets and Plasma)

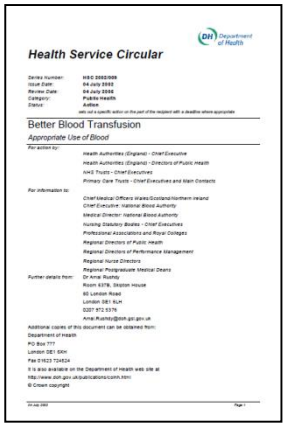
Knowledge

- Often patients refuse because know the facts
- Usually blood borne viruses e.g HIV is the issue

Guidelines:

Better Blood Transfusion (BBT) 2/3 (2002/2007):

- "Ensure the appropriate use of blood and use of effective alternatives in every clinical practice where blood is transfused"
- Trusts should review and explore the use of effective alternatives to donor blood and the appropriate use of autologous blood transfusion.
- "Avoid unnecessary use of donor blood in clinical practice"



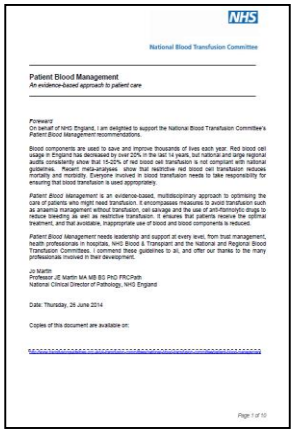
Health Service Circular

Better Blood Transfusion

Appropriate Use of Blood

Patient Blood Management (PBM) (2014):

- Avoid transfusion for managing anaemia if alternatives are available e.g. oral iron for iron deficiency anaemia and intravenous iron for functional iron deficiency
- Consider alternatives to transfusion for postoperative anaemia management (volume expanders, intravenous iron)



NHS

National Blood Transfusion Committee

Patient Blood Management

An evidence-based approach to patient care

Cost

- **Expires quickly once donated:**
  - Red cells 35 days
  - Platelets 7 days
  - FFP <24hrs once thawed
- **Blood is expensive:**
  - Red cells £124.46
  - Platelets £178.19
  - FFP £126.52 (for 4 bags)
  - Cryoprecipitate £180.54 (pooled - equivalent to 5 single bags)

So what are the alternatives?

Collection & Reinfusion of patient's own red blood cells (Autologous blood transfusion)

- Stimulated by concerns about viral transmission by donor blood, 1980s
- Must be performed in a licensed blood establishment
- Most healthy adult patients can donate up to 3 RBC units before elective surgery
- BCSH 2007 severely questioned the rational, safety & cost effectiveness of routine Predeposit autologous donation (PAD)

Autologous blood transfusion

- Rarely performed in the UK
- BCSH only recommends its use in ‘exceptional’ circumstances;

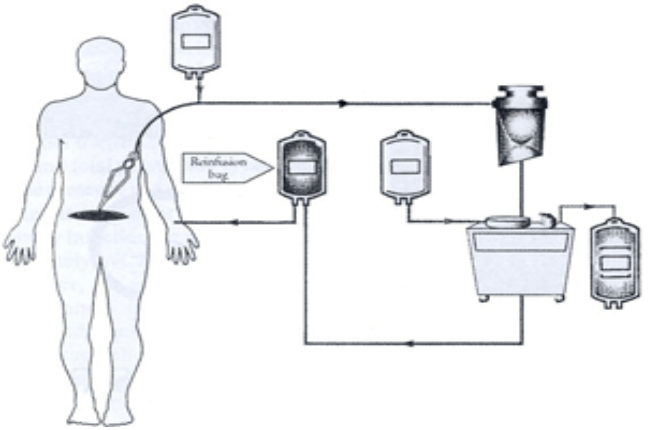
✓ Patients with rare blood groups/multiple blood group antibodies where difficulties in getting compatible donor blood

✓ Patients at serious psychiatric risk because of anxiety about exposure to donor blood

✓ Patients who refuse to consent to donor blood transfusion

✓ Children undergoing scoliosis surgery

Alternatives - Cell salvage
Intra operative



- Collection and reinfusion of blood spilled during surgery

- Suitable for various procedures, and proven benefit in:
- Orthopaedics
- Vascular surgery
- Cardiac surgery
- Urology
- Obstetrics

- Acceptable to some JW’s

Alternatives -Cell salvage
Post operative

- Collect blood lost post operative from surgical drains or wounds and given back to the patient
- Mainly orthopaedic and cardiac cases
- Reinfusion must be monitored and documented the same way as donor Transfusions
- Acceptable to some Jehovah's Witnesses

Post op cell salvage

NICE guidance(2015) -Cell salvage

- Offer tranexamic acid to adults undergoing surgery who are expected to have at least moderate blood loss(greater than 500ml
- Do not routinely use cell salvage without tranexamic acid
- Consider intra-operative cell salvage with tranexamic acid for patients who are expected to lose a very high volume of blood

Minimising blood loss

- Tranexamic acid inhibits the breakdown of blood clots (anti-fibrinolytic)
- Reduces blood loss and the risk of receiving blood transfusion(s)

CRASH 2
Clinical Randomisation of an Antifibrinolytic in Significant Haemorrhage

- Tranexamic acid should be given as early as possible to bleeding trauma patients; if treatment is not given until three hours or later after injury, it is less effective and could even be harmful.

woman
World Maternal Antifibrinolytic Trial

"Tranexamic acid reduces death due to bleeding in women with post-partum haemorrhage with no adverse effects.
When used as a treatment for post-partum haemorrhage, tranexamic acid should be given as soon as possible after bleeding onset."

Suggestion that Aprotinin appears to be more effective than tranexamic acid in reducing blood loss during cardiac surgery.

Minimising blood loss

✓Surgical techniques

Harmonic Scalpel

✓Anaesthetic techniques

Fibrin Sealants

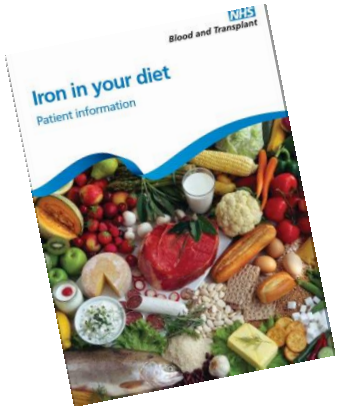
Regional anaesthesia/ Controlled hypotension

Normothermia/ Avoid acidosis

Alternatives to transfusion cont.….

- Oral Iron tablets (ferrous sulphate etc)
- IV iron (venofer, cosmofer, Ferinject, Monofer etc)
- B12
- Folate
- Better diet = better Hb = less transfusions

- Erythropoiesis stimulating agents (ESAs)



NICE guidance(2015) –surgery and oral/intravenous iron

Offer oral iron before and after surgery to patients with iron deficiency anaemia

Consider IV iron before or after surgery in patients who :

- have iron-deficiency anaemia and cannot tolerate iron or non compliant with oral
- are diagnosed with functional iron deficiency
- are diagnosed with iron deficiency anaemia and the time interval between diagnosis and surgery is too short for oral iron to be effective

NICE guidance(2015) –Erythropoietin and surgery

Do not offer erythropoietin to reduce the need for blood transfusion in patients having surgery, unless

- The patient has anaemia and meets the criteria for blood transfusion but declines
- The appropriate blood type is not available because of the patients red cell antibodies

Alternatives – The future

- “Artificial blood”
- Blood substitutes aim to replicate one particular job; supplying oxygen to tissues.
- Hemopure – is based on bovine haemoglobin, and was approved for human use in South Africa back in 2001.
- From stem –encourage growth using chemical growth using chemical growth factors.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Artificial blood to be tested on humans - and could be used in transfusions by 2035

- A team at the University of Edinburgh is undertaking a £5million project
- The research has been looking at making red blood cells from stem cells
- They have now reached an efficiency of almost 50 per cent
- In 2016 they will trial their artificial blood in 3 patients with blood disorders
- If successful, artificial blood could replace donated blood in 20 years

“Lab-grown blood given to volunteer for the first time”

November 2011 (Advanced Cell Technology in Worcester, Massachusetts)

“The quest for one of science’s holy grails: artificial blood”

Scientists create 'limitless supply of blood' in stem cell breakthrough