Patient Blood Management

Dr Kate Pendry
Consultant Haematologist Central Manchester Hospitals
and
Clinical Director for PBM NHSBT
Overview

• What is Patient Blood Management?
• Why is Patient Blood Management important?
• The recommendations
• Implementation of Patient Blood Management
• Key Performance Indicators in Patient Blood Management
What is Patient Blood Management?

- An evidence-based, multidisciplinary team approach to optimising the care of patients who might need transfusion
- Focuses on measures for blood avoidance as well as correct use of blood components when they are needed
- Improves patient care, optimises use of donor blood and reduces transfusion-associated risk
- Reduces financial costs
It’s International!

PBM Concepts from AABB:

• Limit loss through phlebotomy and testing
• Optimise patient’s haemoglobin levels before surgery
• Using red cell recovery techniques
• Minimise peri-operative blood loss
• Making evidence based decisions re transfusion

Other countries, Australia and Austria refer to 3 pillars:

• Optimising pre-op cell volume
• Reduction of peri-operative blood loss
• Increasing tolerance to anaemia and accurate blood transfusion triggers
• Adopted by WHO in 2010 to improve transfusion safety
Red cell issues per 1000 population
Why is Patient Blood Management Important?

- Limited supply
- Hazards of transfusion
- Variation in practice
The falling donorbase...
Change in Red cell usage 1999-2013

Moving Annual Total of Red Cell [Full Unit Equiv] Issues to Hospitals - 000s

BBT HSC 1
BBT HSC 2
NHSBT HL Teams est.d
BBT HSC 3
PBM Launch
## Relative risks of complications of transfusion (SHOT 2012)

<table>
<thead>
<tr>
<th>Complication</th>
<th>Death - Risk per components transfused</th>
<th>Major morbidity - Risk per components transfused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall risks from SHOT data</td>
<td>1 in 322,580</td>
<td>1 in 21,413</td>
</tr>
<tr>
<td>Hepatitis B (Public Health data)</td>
<td></td>
<td>1 in 1.3 million</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td></td>
<td>1 in 28 million</td>
</tr>
<tr>
<td>HIV</td>
<td></td>
<td>1 in 6.7 million</td>
</tr>
<tr>
<td>Acute transfusion reaction</td>
<td>1 in 42,473</td>
<td></td>
</tr>
<tr>
<td>Haemolytic transfusion reaction</td>
<td>1 in 322,580</td>
<td></td>
</tr>
<tr>
<td>Transfusion-associated circulatory overload</td>
<td>1 in 476,190</td>
<td>1 in 99,010</td>
</tr>
<tr>
<td>All errors</td>
<td></td>
<td>1 in 169,492</td>
</tr>
</tbody>
</table>
Results of National Comparative Audit of Use of Blood in Cardiac Surgery 2012

Red Cells
22% - 66%

FFP
3% to 46%

Platelets
4% to 42%
National Comparative Audit of Use of Blood in Medical patients 2011 (NW regional results)
National Comparative Audit of use of red cells in primary hip replacement 2009

Where Do Red Cells Go in 2014?
Age and gender distribution

Age, by 5 year bands

Mean Age 64 years

Numbers of units

[Bar chart showing age distribution by gender with peaks at various age groups, including a note indicating a mean age of 64 years.]
Usage by broad category

- **31287**, 68%
- **12250**, 26%
- **2663**, 6%
- **136**, 0%

**Medicine**

**Not recorded**
## Breakdown of medical use by main category

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haematology</td>
<td>12589</td>
<td>27.17</td>
</tr>
<tr>
<td>GI Bleed</td>
<td>5410</td>
<td>11.68</td>
</tr>
<tr>
<td>Non-haematological anaemia</td>
<td>12704</td>
<td>27.42</td>
</tr>
<tr>
<td>Neonatal/fetal</td>
<td>584</td>
<td>1.26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>32187</td>
<td>67.52</td>
</tr>
</tbody>
</table>
## Highest use by diagnosis in medicine

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Number</th>
<th>Percentage of total usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-haematological cancer</td>
<td>4541</td>
<td>9.8</td>
</tr>
<tr>
<td>Myelodysplasia</td>
<td>2923</td>
<td>6.31</td>
</tr>
<tr>
<td>Renal failure</td>
<td>2242</td>
<td>4.84</td>
</tr>
<tr>
<td>Acute upper GI bleed</td>
<td>2192</td>
<td>4.73</td>
</tr>
<tr>
<td>Acute Myeloid leukaemia</td>
<td>1987</td>
<td>4.29</td>
</tr>
<tr>
<td>Lymphoma/CLL</td>
<td>1881</td>
<td>4.06</td>
</tr>
<tr>
<td>Critical care</td>
<td>1649</td>
<td>3.56</td>
</tr>
<tr>
<td>Sickle cell anaemia</td>
<td>1350</td>
<td>2.91</td>
</tr>
<tr>
<td>Non-haem anaemia, not specified</td>
<td>1338</td>
<td>2.89</td>
</tr>
<tr>
<td>Acute lower GI bleed</td>
<td>1255</td>
<td>2.71</td>
</tr>
<tr>
<td>Iron deficiency</td>
<td>1255</td>
<td>2.71</td>
</tr>
<tr>
<td>GI blood loss, site unknown</td>
<td>1091</td>
<td>2.35</td>
</tr>
<tr>
<td>Myeloma</td>
<td>1085</td>
<td>2.34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24789</strong></td>
<td><strong>53.5</strong></td>
</tr>
</tbody>
</table>
Highest-using specialties in surgery by main category

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiothoracic</td>
<td>2838</td>
<td>6.12</td>
</tr>
<tr>
<td>Trauma</td>
<td>2199</td>
<td>4.75</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>1767</td>
<td>3.81</td>
</tr>
<tr>
<td>GI Surgery</td>
<td>1737</td>
<td>3.75</td>
</tr>
<tr>
<td>Vascular</td>
<td>1109</td>
<td>2.39</td>
</tr>
<tr>
<td>Urology</td>
<td>938</td>
<td>2.02</td>
</tr>
<tr>
<td>Solid Organ Tx</td>
<td>409</td>
<td>0.88</td>
</tr>
<tr>
<td>Neuro surgery inc injury</td>
<td>279</td>
<td>0.6</td>
</tr>
<tr>
<td>Plastic inc burns</td>
<td>204</td>
<td>0.44</td>
</tr>
<tr>
<td>ENT</td>
<td>191</td>
<td>0.41</td>
</tr>
<tr>
<td>Other surgery</td>
<td>579</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12250</strong></td>
<td><strong>26.44</strong></td>
</tr>
</tbody>
</table>
PBM Recommendations July 2014

transfusionguidelines.org

- Establishment of PBM programme
- Identify PBM champions
- Patient and staff education
- Active management of anaemia
- Minimise volume of blood samples taken
- Use restrictive transfusion thresholds
- In non-bleeding patients transfuse one dose of blood component then reassess
- Active management of abnormal haemostasis
- Use alternatives to transfusion where appropriate
- Surgical patients
  - Detect and treat pre operative anaemia
  - Minimise blood loss and bleeding
  - Use cell salvage where appropriate

NICE Guidelines due to be published August 2015
Patient Blood Management

1st Pillar
Diagnose and manage Anaemia

2nd Pillar
Minimise blood loss - Control bleeding

3rd Pillar
Avoid unnecessary transfusion

Multidisciplinary team approach

Alternatives to blood transfusion Spahn DR, Goodnough LT
Lancet 2013 381 1855-1865
Does your Trust have a consultant haematologist dedicated to Transfusion?

Number of Consultant PAs dedicated to Transfusion

Survey of 150 Trusts in England and North Wales Sept 2013
Resources for PBM

Survey of 150 Trusts in England and North Wales Sept 2013

Resources for PBM

- Transfusion Practitioner wte (No: 110, Yes: 50)
- Data analyst (No: 120, Yes: 30)
- Admin support (No: 100, Yes: 40)
- Lab IT support (No: 80, Yes: 60)
- HTC ToR (No: 70, Yes: 90)
Reducing transfusions saves money....

Implementation of a PBM Strategy in Eastern Maine USA

Irwin Gross

Blood Acquisition Cost Savings – All Components

- Total blood acquisition costs in FY ’06 were $3,200,000
- Cost savings compared to base year, FY ’06*
  - FY ’07 $ 850,000
  - FY ’08 $ 1,400,000
  - FY ’09 $ 1,600,000
  - FY ’10 $ 1,550,000
  - Total $ 5,400,000

* No change in per unit cost from blood supplier from 2007 - 2010
Platelets
Don’t use two...
...when one will do

For prophylactic use in a 70kg adult, one adult therapeutic dose (ATD) typically gives an immediate rise in platelet count of approximately 20 - 40 x 10^9/L.

Do not administer double-dose platelets for prophylactic transfusions as this practice does not decrease the risk of bleeding.

Request and administer one unit, then reassess your patient.

A platelet increment can be obtained 10 minutes after completion of the transfusion.

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Better Blood Transfusion: maintaining the supply and safety of blood

By Rebecca Garnett, Head of Blood Transfusion, NHS Blood and Transplant

Maintaining the supply and safety of blood is key priority for the NHS Blood and Transfusion (BTS), and it is an important reminder that it is used appropriately.

The BTS is committed to ensuring that blood is used in a manner that maximizes patient safety and efficiency. This requires collaboration with hospitals in improving transfusion practices and an effort to continually innovate and consultative efforts led by Rebecca Garnett...

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Patient Blood Management
Optimizing the care of patients who may need transfusion

What is Patient Blood Management (PBM)?

PBM is a strategy that, multi-disciplinary approach, aiming at the care of patients who may need a blood transfusion.

PBM focuses on the prevention of anemia, PBM promotes the use of alternative solutions, including the use of blood components.

Why is PBM needed?

- Improved outcomes
- Reduced infections
- Reduced hospital stays

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Information for clinicians

Safety Advice

Articles

Guidance for hospital staff

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NHS Blood Transfusion

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Patient Blood Management

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Better Blood Transfusion: maintaining the supply and safety of blood

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Posters

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Articles

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Guidance for hospital staff

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Safety Advice
Information for Patients

- Will I need a blood transfusion?
- Iron in your diet
- Receiving a plasma transfusion
- Children’s leaflets
- Others in progress on anaemia, PBM and frozen components
Current pilots

- SW: linking pre and post transfusion lab test results to transfusion episode (Clinisys)
- NW: Implementation of pre operative anaemia services
- London: Introduction of a single unit transfusion policy
Other PBM activities

• Development of a PBM App

• Medical Audit Working Group: anaemia management algorithm, laboratory algorithm, definition of minimum transfusion dataset to standardise requesting

• Supporting Clinical benchmarking database
Systematic data collection supported by HSCIC

- LIMS data related to transfusion episode
- PAS data related to length of stay, consultant, specialty
- PAS coded data related to transfusion episode Healthcare Resource Group (HRG)

Data mining software extracts relevant data: data linkage

Data warehouse hosted by blood service

Analysis and reports
Planned Audits

- Surgical PBM audit April 2015
- Audit of use of blood components in Haematology patients 2016
- Both will be linked to AFFINITIE study
Developing Key Performance Indicators for PBM

1. Proportion of red cell, platelet and plasma units with pre transfusion lab tests and clinical indication documented

2. Proportion of patients undergoing major blood loss surgery where pre operative anaemia screening was performed at least 2 weeks before surgery

3. Transfusion rates for key operations eg: primary CABG, primary hip replacement, AAA repair (red cells, FFP, plts)

4. Proportion of patients undergoing surgery (eg: AAA, CABG) where intra operative cell salvage and tranexamic acid were used

5. Timely supply of component (massive haemorrhage)

6. Proportion of requests made by staff trained in blood ordering

7. Proportion of requests where patient has been ’consented’
Implementing performance management – Aims of NBTC

- The gold standard would be to develop a central mechanism for data collection and analysis

- Provide information on blood utilisation and adherence to Blood Management KPIs for individual institutions (down to clinician level)

- Support benchmarking of practice between similar institutions