Challenges of changing transfusion practice

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Challenges for hospital transfusion

- Patient safety: *few, ideally zero, errors and few complications of transfusion*
- Effective use of blood: *less inappropriate use = ?% further reduction in use*
- Robust audit trail and documentation: *100%*
- Good blood stock management and low wastage
- Good staff training
- Rapid availability: *under-recognised issue*
MANY DRIVERS FOR IMPROVING HOSPITAL TRANSFUSION
BUT IMPLEMENTATION HAS BEEN CHALLENGING
Better Blood Transfusion

**Concerns:**
- Patient safety: errors, vCJD
- Demand for blood and shortages
- Evidence of variation in practice

**Outputs in form of HSCs:**
- HTC/HTTs, NBTC/RTCs
- Guidelines, audits
- Support from NHSBT
- Patient involvement
- Use of technology
- Clinical research
### Change in red cell usage 1999-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Red Cell Issues</th>
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</thead>
<tbody>
<tr>
<td>1999/00</td>
<td>1,500,000</td>
</tr>
<tr>
<td>2000/01</td>
<td>1,590,000</td>
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<tr>
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<td>1,600,000</td>
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<tr>
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<tr>
<td>2012/13</td>
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Red Cell Issues:

- 1999/00: 1,500,000
- 2000/01: 1,590,000
- 2001/02: 1,600,000
- 2002/03: 1,620,000
- 2003/04: 1,630,000
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- 2007/08: 1,670,000
- 2008/09: 1,680,000
- 2009/10: 1,690,000
- 2010/11: 1,700,000
- 2011/12: 1,710,000
- 2012/13: 1,720,000

Percentage Changes:

- 1999/00: -0.7%
- 2000/01: -1%
- 2001/02: -1%
- 2002/03: -1.3%
- 2003/04: -5.9%
- 2004/05: -4.4%
- 2005/06: -3.5%
- 2006/07: -2.6%
- 2007/08: 1.8%
- 2008/09: 0.3%
- 2009/10: -1.4%
- 2010/11: -0.2%
- 2011/12: -2.9%
Change in red cell issues/1000 population

Red Cell Issues from NHSBT per 1000 Population

Issues per 1000 Population of England

Financial Year

Data for 2012/13 are actual up to February 2013.
Changes in proportion of red cell usage for main clinical specialties 1999-2009

Possible reasons for reduction in red cell transfusion

- Better Blood Transfusion initiatives
- Concern about vCJD
- Increasing price of blood
Change in price of red cells 1999-2013


Cost (£): 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150
Change in platelet usage 1999-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Platelet Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999/00</td>
<td>200,000</td>
</tr>
<tr>
<td>2000/01</td>
<td>201,000</td>
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<tr>
<td>2001/02</td>
<td>202,000</td>
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<td>209,000</td>
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<td>2009/10</td>
<td>210,000</td>
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<tr>
<td>2010/11</td>
<td>211,000</td>
</tr>
<tr>
<td>2011/12</td>
<td>212,000</td>
</tr>
<tr>
<td>2012/13</td>
<td>213,000</td>
</tr>
</tbody>
</table>

Percentages:
- 1999/00: +1.4%
- 2000/01: +2.4%
- 2001/02: +0%
- 2002/03: +2.3%
- 2003/04: -0.5%
- 2004/05: -0.9%
- 2005/06: +0.5%
- 2006/07: -1.8%
- 2007/08: +0.9%
- 2008/09: +4.1%
- 2009/10: +4.0%
- 2010/11: +3.8%
- 2011/12: +8.2%
- 2012/13: +1%
Where are we now?

- National, regional and local audits consistently show inappropriate use of 15-20% red cells and 20-30% platelets/plasma.
- Low uptake of methods to avoid use of blood.
- Safety of hospital transfusion still an issue.
- Poor education and training.
- Lack of patient involvement.
- Evidence base getting stronger but more research needed.
- Poor IT for blood safety and for providing data on blood usage.

See NBTC Annual Reports
## Summary of the inappropriate use of blood from large regional and national audits of blood use

<table>
<thead>
<tr>
<th>Audit</th>
<th>Year</th>
<th>Number of Hospitals</th>
<th>N cases audited</th>
<th>Inappropriate use</th>
<th>Guideline Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red cell transfusion</td>
<td>2002</td>
<td>All 13 hospitals in N. Ireland</td>
<td>360</td>
<td>19% of patients inappropriately transfused and 29% over-transfused</td>
<td>British Committee for Standards in Haematology (BCSH) (2001)</td>
</tr>
<tr>
<td>Red cells in hip replacement</td>
<td>2007</td>
<td>139/167 (83%)</td>
<td>7465</td>
<td>48% of patients</td>
<td>British Orthopaedic Association (2005)</td>
</tr>
<tr>
<td>Upper GI bleeding</td>
<td>2007</td>
<td>217/257</td>
<td>6750</td>
<td>15% of RBCs, 42% of platelets, 27% of FFP</td>
<td>British Society of Gastroenterology (2002)</td>
</tr>
<tr>
<td>Red cell transfusion</td>
<td>2008</td>
<td>26/56 (46%) hospitals in 2 regions</td>
<td>1113</td>
<td>19.5% of transfusions</td>
<td>BCSH (2001)</td>
</tr>
<tr>
<td>FFP</td>
<td>2009</td>
<td>186/248 (75%)</td>
<td>5032</td>
<td>43% of transfusions to adults, 48% to children, 62% to infants</td>
<td>BCSH (2004)</td>
</tr>
<tr>
<td>Platelets in haematology</td>
<td>2011</td>
<td>139/153 (91%)</td>
<td>3296</td>
<td>27% of transfusions</td>
<td>BCSH (2003)</td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td>2012</td>
<td>43/82 (52%) from 3 regions</td>
<td>449</td>
<td>25% of transfusions</td>
<td>BCSH (2004)</td>
</tr>
</tbody>
</table>
Proportion of CABG patients receiving RBCs

National audit of blood use in cardiac surgery, 2011
An evidence-based, multidisciplinary approach to optimising the care of patients who might need a blood transfusion

PBM includes:
- Minimising blood sample volume
- Appropriate transfusion triggers
- Managing pre-op anaemia
- Intra- and post-op management e.g. cell salvage, assessing and managing abnormal haemostasis

Need better data on transfusion:
- Which patients?
- Why?
- Provide feedback to clinicians
- Provide ‘decision support’
What has happened since then?

- National Blood Transfusion Committee has established a PBM working group
- Initial recommendations have been drafted

See NBTC website: Patient Blood Management
http://www.transfusionguidelines.org.uk/Index.aspx?Publication=NTC&Section=27&pageid=7728
Further work includes:

- a ‘baseline’ national audit (later this year)
- central mechanism for benchmarking blood usage and transfusion practice in hospitals
- standard dataset for transfusion
- development of performance indicators

See NBTC website: Patient Blood Management
http://www.transfusionguidelines.org.uk/Index.aspx?Publication=NTC&Section=27&pageid=7728
“Our vision in Oxford”

To develop and implement process change supported by IT to:-

- Enhance patient safety
- Reduce the administrative burden for clinical staff
- Optimise our use of resources (reduce blood use and blood wastage)
- Achieve compliance with tightening statutory and governance requirements
- Ensure the rapid availability of blood for urgent transfusions
End-to-end electronic transfusion

Bar-coded patient ID on the wristband is used to label the sample and blood bag

Davies et al. Transfusion 2006; 46: 352-364
Benefits 2006-11
(125,000+ units red cells transfused)
(Murphy et al. Transfusion, in press)

- No ABO incompatible red cell transfusions
- No serious wrong blood events
- ‘Wrong blood in tube’ reduced by over 50% to 1 in 26,690 samples (national benchmark 1 in 3,000 samples)
- Compliance with blood traceability, competency assessment etc
- Less blood wastage
- Lower blood usage (12% in 6 years)
Estimated costs and cost savings
(Murphy et al. Transfusion, in press)

Costs:
- About £11/unit to cover lease of bedside and fridge hardware, software licences, training, and a system manager (= £350k/year for Oxford)

Productivity gains:
- Nursing time (£500k/year)
- Transfusion laboratory staff time (£20k/year)
- Staff and time for meeting regulatory requirements and for training (£20k/year)

Cash releasing savings:
- Blood wastage (£20k/year)
- Blood usage (£400k/year)

Compares well with some transfusion safety measures

http://www.evidence.nhs.uk/qipp
Challenges for development and implementation (..‘changing practice’)
Murphy et al (2009). Transfusion 49;829-837

- **Getting started:** recognising the need and developing the initial business case
- **Engaging and getting support** from senior management, IT, and clinical colleagues
- **Identifying appropriate commercial partner**
- **Conducting pilots and documenting benefits:** leading to further business cases
- **Funding:** £1.5 million/first 5 years
- **Project management:** 160 clinical areas
- **Training:** 4,000 nurses and 1,400 doctors
- **Establishing/maintaining implementation team**
- **Monitoring progress**
- **Publishing output and celebrating success**
<table>
<thead>
<tr>
<th></th>
<th>2007*</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood tracking</td>
<td>23/98 (24%)</td>
<td>55/116 (47%)</td>
</tr>
<tr>
<td>Bedside check</td>
<td>12/98 (12%)</td>
<td>18/115 (16%)</td>
</tr>
</tbody>
</table>

Data from surveys of hospitals in England by the National Blood Transfusion Committee

Blood ordering process using EPR
Select clinical reason for transfusion
Select specific criteria for transfusion

Details for Red cells

*Collection Priority: Planned
*Collection Date/Time: 05/20/2013
Collect Now: Yes
*Specimen Type: Blood
*Previous Transfusion History: Yes
Previous Antibodies:
*Transfusion Reason: Ortho Primary Hip
Haemoglobin:

*Red Blood Cell Transfusion Criteria:
*Special Transfusion Requirements:
*Red Cells - no. of units:
*Date/Time Required:
Location of patient at time of transfusion (if different):

*Mobile/Telephone Number:
Label Printer:
Nurse Collect: Yes
*No
Clinical Details:
Complete number of units, time etc
Alert if criteria for appropriate transfusion not met

TOTAL BLOOD MANAGEMENT ALERT

The most recent haemoglobin level available for this patient is greater than 8g/dl; outside the OUH guidelines for administration of red blood cells based on evidence-based treatment for anaemia. Specific clinical conditions such as an acute ischemic event or acute on-going blood loss may justify a variation from the guideline. In the absence of these conditions, the risks of transfusion may exceed the benefits at this haemoglobin level. Please choose the appropriate action below to resolve this alert.

Alert Action
- [ ] Cancel Blood Transfusion Order
- [ ] Proceed with Blood Transfusion Order

OK
Effectiveness of RBC alert – about 10%

Thanks to Mark Yazer, Pittsburgh
Effectiveness of plasma alert

Thanks to Mark Yazer, Pittsburgh
Monitoring of blood usage

Horizontal bars are the Hb trigger to target range for all transfused patients.

Trigger: lowest Hb
Target: last Hb before discharge

Ideally:
Trigger: pre-Tx Hb
Target: post-Tx Hb

Specialty A
Specialty B
Specialty C
Specialty D
Specialty E
Specialty F
Specialty G
Specialty H
Specialty I

5 6 7 8 9 10 11
Hb (g/dL)
Blood utilization in hospitals in England

- There has been significant improvement supported by education, training and audit /blood utilization review
- But further progress is required
- Reliance on these standard methods will not be enough
- Improvement in evidence on optimal transfusion practice and in methods to implement it