The blood supply – drivers, challenges and future plans

Rebecca Gerrard
Head of Better Blood Transfusion

Right Blood, Right Reason 25th January 2013
3 Key Messages

- Blood supply in UK may not always be plentiful
- Need to reduce waste across the supply chain
- Involve the patient and use blood appropriately
NHS Blood and Transplant

- Manages the national voluntary donation system for blood, tissues, organs and stem cells turning these precious donations into products that can be used safely to the benefit of the patient.
- Last year received 3,500 organ and 4,000 tissue donations and banked 2,200 cord blood units from across the UK.
- Supply around 2 million units of blood a year to hospitals in England and north Wales.
What are the current drivers for the blood supply?
Demand Drivers for red blood cells in the hospital

TOTAL Blood

Blood used per Transfusion

Number of Transfusions

STOCKS

Drivers that are a function of RBC usage type (see separate chart)

TEG Technology

Drivers

Cell Salvage

Keyhole surgery

Technology

MSBOS

Use of Transfusion Practitioners

Use of Pre-operative Assessments

Efficiency

Number of junior doctors

MSBOS

Transfusion trigger levels

Technology

Policy changes (targets, regulations etc)

Iron deficiency drugs

Cell Salvage

Autologous drains (hip / knee surgery)

Use of new / existing treatments

Accident rates

Health (obesity, diet, alcoholism, etc)

Total Number of Patients

Birth rates

Mortality rates

Disease rates

Remote / Electronic Issue

Extended shelf life of products

Use of Pre-operative Assessments

Disease rates

MSBOS

Disease rates

Disease rates

Disease rates

Iron deficiency drugs

Drivers

Iron deficiency drugs

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Iron deficiency drugs
Demand Drivers in NHSBT

- Demand for blood - benchmarking
- Inappropriate use - audit data
- DH - NHSBT Commercial Review 2011
- NHSBT Strategy
- Compliance with legislation / inspections
- Minimise risk / improve safety
- Patients
- Reduce costs / wastage
But.....

• Things changed in September 2007
September 2007

• Status Quo released their 28th album ‘In Search of the Fourth Chord’
• House prices peaked
• Gordon Brown was appointed Prime Minister
• The onset of the financial crisis - Bank of England was forced to hand emergency funding to Northern Rock
• Summer 2007 was the wettest on record
• Demand for blood components started to rise
Moving Annual Total of Red Cell [Full Unit Equiv] Issues to Hospitals - 000s

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Moving Annual Total of Frozen Component Issues to Hospitals - 000s

The chart shows the moving annual total of frozen component issues to hospitals in thousands. The data points are scattered across the years, with a noticeable increase in the latter part of the period displayed.
Blood Usage in comparison with other European countries

Red Cell Usage

- NHSBT reported a blood usage rate of 34.5 units / 1000 population.
- Compares well with the other well developed EBA members
Platelet Usage in comparison with other European countries

Platelets

- NHSBT reports a rate of 5.0 ATDs / 1000 population in 2011-12
- This fell mid-range in the reported usage rates (3.2 to 8.0)
What about donations?

- Is blood donation keeping pace with the issue?
Long term trend in active donor numbers
Demographics

- Demand Driver Parameters used in model Projections:

<table>
<thead>
<tr>
<th>Contributory factor: RBC</th>
<th>1 year</th>
<th>3 years</th>
<th>10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic effects</td>
<td>1.3% increase</td>
<td>4.3% increase</td>
<td>15.9% increase</td>
</tr>
<tr>
<td>Changes in the rate of procedures / treatment per 100,000 population</td>
<td>1.0% increase</td>
<td>3.0% increase</td>
<td>10.3% increase</td>
</tr>
<tr>
<td>Changes in the average red blood cell use per procedure / treatment assuming a power-law fit.</td>
<td>2.5% decrease</td>
<td>6.7% decrease</td>
<td>16.3% decrease</td>
</tr>
</tbody>
</table>
Demand Predications

• Clinical demand for all main blood components is expected to increase especially for:
  – O neg red cells
  – Platelets
  – Cryoprecipitate
So......

- Demand is increasing....
- Donor base is declining....

Where is all that blood going?
Red blood cell usage

Medical 61.7%
- Anaemia, 31.3%
- GI bleed, 11.8%
- Neonatal, 1.6%
- Haematology, 18.1%

Obstetric / gynaecological 6.5%
- Obstetrics, 4.3%
- Gynaecology, 1.0%
- Gynaec non malignant, 1.2%

Surgical 31.0%
- Orthopaedics, 7.3%
- Trauma, 3.8%
- Cardiothoracic, 4.7%
- Vascular Surgery, 2.5%
- GI and liver, 5.3%
- GI bleed, 11.8%
- Transplant, 1.6%
- Plastic surgery, 0.8%
- Neurosurgery / ENT, 0.9%

Other / unknown, 15.7%
- Road Traffic accident, 0.9%
- Neurosurgery / ENT, 0.9%

Data from Wallis et al. audit, 2008 – NOT PUBLISHED
Do we need all that blood?

- Are we using it appropriately?

- Are we wasting any?
What do audits tell us about inappropriate use?

15 - 62% inappropriate
<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
<th>Number of hospitals</th>
<th>N cases audited</th>
<th>Inappropriate use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red cells in hip replacement</td>
<td>2007</td>
<td>139/167 (83%)</td>
<td>7465</td>
<td>48% patients</td>
</tr>
<tr>
<td>Upper gastrointestinal bleeding</td>
<td>2007</td>
<td>217/257 (84%)</td>
<td>6750</td>
<td>15% of rbcs, 42% of platelets, 27% of FFP</td>
</tr>
<tr>
<td>Red cell transfusion</td>
<td>2008</td>
<td>26/56 (46%) hospitals in two regions</td>
<td>1113</td>
<td>19.5% of transfusions</td>
</tr>
<tr>
<td>FFP</td>
<td>2009</td>
<td>186/248 (75%)</td>
<td>5032</td>
<td>43% to adults, 48% to children, 62% to infants</td>
</tr>
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</table>
20% of cases had a possible potentially reversible anaemia. Transfusion was started above the agreed audit haemoglobin standard in 35% of patients with anaemia and 6% of patients with blood loss. 33% of patients were transfused to >2g/dl above the agreed audit standard. Overall, 53% of cases fell outside the algorithm set.

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<tr>
<td>Platelets in haematology</td>
<td>2011</td>
<td>139/ 153 (91%)</td>
<td>3296</td>
<td>27% of transfusions</td>
</tr>
<tr>
<td>Cryo-precipitate</td>
<td>2012</td>
<td>43/82 (52.4%) from 3 regions</td>
<td>449</td>
<td>25% of transfusions</td>
</tr>
<tr>
<td>Red cells in Adult Medical Patients - Part 1</td>
<td>2012</td>
<td>197 from across UK</td>
<td>9126</td>
<td>20% of cases had a possible potentially reversible anaemia. Transfusion was started above the agreed audit haemoglobin standard in 35% of patients with anaemia and 6% of patients with blood loss. 33% of patients were transfused to &gt;2g/dl above the agreed audit standard. Overall, 53% of cases fell outside the algorithm set.</td>
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What about wastage?

In NHSBT in 11/12:
- 19,600 units of rbcs wasted (1.1% of issues)
- 14,400 units of platelets wasted (5.4% of issues)

In hospitals:
- 39,600 units of rbcs wasted (2.2%)
- 10,700 units of platelets (4%)

The highest wastage occurred in the Medically Ordered Not Used category, at almost 50% of the total wastage.
Recommendation 1
'More work should be done both at national and trust level to support trusts, in achieving and maintaining best practice, to reduce the inappropriate use of red cells, platelets and fresh frozen plasma; this would improve patient care and reduce costs to trusts and would in turn reduce demand and direct costs on NHSBT'.
NHSBT Strategy

‘To deliver a modern, world class blood service that provides a sustainable and dependable supply of blood components that meet all safety, quality, compliance and service standards, as effectively as possible.’
Safety / Minimising risks

- Blood transfusion has a chequered history.
- No clear consensus for many aspects.
- Costs rising.
- New safety measures expensive.
- Inspection and regulation.
- Blood services need to constantly assess new risks.
What do we tell patients?

- 'The risk of getting hepatitis from a platelet transfusion in the UK is about 1 in 1 million for Hep B and 1 in 72 million for Hep C. The chance of getting HIV is about 1 in 6 million.'

  OR......

- 'You are more likely to die in a gas incident (fire, explosion or carbon monoxide poisoning) than to get Hep B from a blood transfusion.'
Avoidable headlines

The Telegraph

“Killed by a needless blood transfusion”

Judy Kenny, whose husband was the first to die from vCJD contracted via a blood transfusion, is campaigning for tighter controls over the procedure

'To this day I don’t know why Deryck needed that transfusion’ – Judy Kenny at home in Bournemouth, with a picture of her late husband Deryck

15 Oct 2012
What other challenges are there for the blood supply?
Supply Chain Challenges

- Logistics / Transport - including ad hocs
- 24/7 working
- Vehicle and lab machines under-utilised
- Blood collection sessions
- Diminishing resources
- Consolidation
What are the future plans for the blood supply?
Blood Donation Strategy

• Blood donation
  – Need to attract sufficient donors to meet the future demand
  – ‘Digital natives’
  – Club 96
  – Migration

21st Century - Combining the kindness of strangers with tough economics
Improve Supply Chain Planning

- Reduce waste
- Optimise inventory levels across the supply chain
- Reduced age at issue
- Optimise intra-centre transports
- Improve forecasting
- Reduce substitutions
- Increased customer satisfaction
Really find out where blood actually does go!

- Need timely data of transfusion recipients for future planning and targeting of major users for appropriate blood-saving strategies.
- Targeted audits of appropriate use with effective action plans.

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Pathology Modernisation

- Reduce costs / consolidate / create pathology networks or hub and spoke systems
- IT/TS in NHSBT:
  - shared stock management systems
  - automatic replenishment systems
  - integrated transfusion laboratories
Reduce Inappropriate Use

Better Blood Transfusion → Patient Blood Management

- **Patient** - at the heart of decision making
- **Blood** - conserve patient’s own blood, avoid transfusion where appropriate
- **Management** - organise and co-ordinate
3 Key Messages

- Blood supply in UK may not always be plentiful
- Need to reduce waste across the supply chain
- Involve the patient and use blood appropriately
Thank You

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