Strategies to Improve Blood Inventory Management

Judith Chapman
Blood Stocks Management Scheme, London, UK
The Blood Supply Chain

BLOOD DONOR

TRANSFUSED PATIENT

BLOOD SERVICE

HOSPITAL

BLOOD BANK

Copyright ©AMS
Why do we need to improve Blood Supply Management?

There is not a bottomless pit of blood

Because it is a freely given resource

To improve the interface between supply and demand

NHS
Blood Stocks Management Scheme
“Knowledge is Power”
Sir Francis Bacon 1561 - 1662

The Blood Supply Chain

Data are:
• Essential for understanding the blood supply chain
• A driver for improvement in practice
• Necessary for performance evaluation
Data Collection in the Blood Supply Chain

Blood collection Information; no. of donors called, no. of donors attending, no. of donors not bled etc.

Processing & issue information; losses, outdates, issues to hospitals, orders not met, shelf life of stock etc.

Hospital inventory management information; inventory, no. of transfusions, outdates etc.
Blood Supply Data in the UK

Collected by the **Blood Stocks Management Scheme (BSMS)** from hospitals and blood services in England, Wales and Northern Ireland

The BSMS is a **partnership** between hospitals and blood services
Purpose of the Scheme

• Collect from and provide information to blood services and hospitals
• Act as a data repository
• Lead best practice in blood inventory management
• Provide guidelines on blood inventory management
• Benchmark UK blood service and hospital performance
How does the BSMS fulfil its purpose?

• Use of a web based data management system (VANESA) for collecting data
• Effective communication with participants through the BSMS website, VANESA, regular reports and participant meetings
• Surveys of blood inventory management practice
• VANESA training days
BSMS Data Management System

A web based system that:

**Facilitates:**
- The collection of hospital and blood service stock and wastage data for red cells and platelets
- Benchmarking of performance

**Calculates:**
- The ‘Issuable Stock Index’ (approximation of one day’s worth of stock)
- Wastage as a % of Issues
- Shelf Life of Stock

**Provides:**
- ‘On line’, real time data and charts
Data Collected

• Hospitals supply data online on:
  – DAILY unreserved stock
  – MONTHLY wastage by reason
  – MONTHLY transfused units

• Blood Service automated daily data feed on:
  – Red cell stock
  – Red cell and platelet issues
  – Red cell and platelet wastage
  – Age of stock at issues
Data

Currently
- Confidential to the BSMS staff
- Anonymised

However
Hospitals may agree to de-anonymise and share their data with other participants or with Regional Transfusion Committees
Welcome to BSMS

The Blood Stocks Management Scheme was established in 2001 to understand and improve blood inventory management across the blood supply chain. Hospitals and Blood Centres from England, Wales, and Northern Ireland are currently participating in the scheme.

Central to our work is VANESA, a data management system, where hospital and blood service data is collected. In return participants can view real time data and charts.

What's New?

BSMS Reports

During 2008/09 the BSMS hospital reports will change.

The two six monthly reports will be replaced by a quarterly statement related to individual hospital red cell and platelet issue data. The statement will also include national and peer group comparator data. The six monthly reports will continue to be issued but they will be shorter and more focused.

Link to the annual report section

Latest Publications

60 January 2008
Issue 22 – November 2007...

View Newswire

Training Courses

BSMS Regional Roadshows 2008

The final Road Show will be held on July 8th in Leeds. There are a few places still available. An application form is available via the link.

Successful Regional Road Shows have been held in Manchester, Birmingham, Cardiff, Newcastle and Colindale.

Presentations and workshop feedback will be available online after the Leeds Road Show

Visit: Open Meeting 2008
Activity Log

21 May 2008 12:25:14 : Stock data (Red Cells) for 21 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

20 May 2008 12:52:06 : Stock data (Red Cells) for 20 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

19 May 2008 11:43:17 : Stock data (Red Cells) for 19 May 2008 updated for Cheltenham General Hospital (T154) by BSMS0006

19 May 2008 11:30:02 : Stock data (Red Cells) for 19 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

16 May 2008 13:11:48 : Stock data (Red Cells) for 16 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

15 May 2008 12:18:10 : Stock data (Red Cells) for 15 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

14 May 2008 13:00:57 : Stock data (Red Cells) for 14 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

13 May 2008 12:08:16 : Stock data (Red Cells) for 13 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

12 May 2008 11:39:20 : Stock data (Red Cells) for 12 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

9 May 2008 12:05:46 : Stock data (Red Cells) for 9 May 2008 inserted for Cheltenham General Hospital (T154) by BSMS0006

Messages

No messages

NBS Stock Figures  Tuesday, 27 May 2008

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Red Cells

Platelets
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<th>Hospital</th>
<th>Blood service</th>
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<tr>
<td>Red cell stock</td>
<td>Platelet impacts</td>
<td>Red cell impacts</td>
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<td>Platelet wastage</td>
<td>Red cell charts</td>
</tr>
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<td>Red cell reserved stock</td>
<td>Platelet movements</td>
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<td>Platelet graphs</td>
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<td>Red cell data</td>
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<td>Platelet data</td>
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### NHS

Blood Stocks Management Scheme
Red Cell Stock Entry Page

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<tr>
<th>Blood Group</th>
<th>Ideal stock</th>
<th>Issuable stock</th>
<th>Impacts</th>
<th>Nominal stock</th>
<th>Issuable Stock Index</th>
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<td>16</td>
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Comments

Last updated on 21 May 2008 12:25:14 by bsms0006
Most recent update was for 21 May 2008 on 21 May 2008 12:25:14 by bsms0006

Submit  Reset
Red Cell Wastage Entry Page

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<th>Blood Group</th>
<th>TIMEX</th>
<th>OTCOL</th>
<th>MISC</th>
<th>FF</th>
<th>Day Total</th>
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<th>WAPI</th>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0.00</td>
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<td>0</td>
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Comments

Last updated on 01 May 2008 14:48:42 by bsms0006
Most recent update was for 23 Apr 2008 on 01 May 2008 14:48:42 by bsms0006
# Chart Options

**Red Cells: Graphical Display**

**Hospital name:** Cheltenham General Hospital  
**Pulse code:** T154

**Graph name:**
- [ ] Wastage as a percentage of issue to the hospital (bar)
- [x] Wastage as a percentage of issue to the hospital (line)
- [ ] Issues as a percentage of total issues
- [ ] Issuable stock index
- [ ] Total issues
- [ ] Shelf life stocks
- [ ] Cumulative shelf life stocks
- [ ] Transfused as a percentage of issue

**From the start of:** Apr 2007  
**to the end of:** Mar 2008

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<th>Available categories</th>
<th>Selected categories</th>
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<td>Platelet Usage - High</td>
<td>District General Hospital</td>
</tr>
<tr>
<td>Paediatric Unit</td>
<td></td>
</tr>
<tr>
<td>XM Reserve 48 hrs</td>
<td></td>
</tr>
<tr>
<td>Delivery Time - Middle</td>
<td></td>
</tr>
<tr>
<td>Orthopaedic Unit</td>
<td></td>
</tr>
<tr>
<td>Obstetric Unit</td>
<td></td>
</tr>
<tr>
<td>Casualty</td>
<td></td>
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<tr>
<td>Vascular surgery</td>
<td></td>
</tr>
<tr>
<td>Oncology unit</td>
<td></td>
</tr>
<tr>
<td>Intra-Operative Cell Salvage</td>
<td></td>
</tr>
<tr>
<td>Red Cell Usage - Very High</td>
<td></td>
</tr>
<tr>
<td>Supplied by Bristol</td>
<td></td>
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<tr>
<td>Electronic Issue - High</td>
<td></td>
</tr>
<tr>
<td>Post-Operative Cell Salvage</td>
<td></td>
</tr>
</tbody>
</table>

[Submit]
Wastage Bar Charts

Wastage as a percentage of issue

A, B and O

All Blood Groups

Wastage as a percentage of issue

Month

Month

NHS
Blood Stocks Management Scheme
Large Wastage Chart Bars Side by Side
### Data Page – Red Cell Issues

#### Total monthly gross issue data

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<th>Date</th>
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<th>O Neg</th>
<th>A Pos</th>
<th>A Neg</th>
<th>B Pos</th>
<th>B Neg</th>
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Use of BSMS Data

NBS
- Demand forecasting
- Determining appropriate inventory levels
- Contingency planning
- Supply chain management

Hospitals
- Monitoring
  - Issues from NBS
  - Wastage
- Benchmarking
- Reporting to Hospital Transfusion Committee
- Changes to practice
- Cold chain validation
- Contingency planning
Recommendations for Hospitals

• Use a standard operating procedure for blood ordering
• Ensure staff are trained in blood stock management
• Use computer calculation for assessing the blood order (*evidence based*)
• Use a 24 hour crossmatch reservation period (*evidence based*)
• Include blood transfusion in the medical induction programme
Crossmatch Reservation period – 24 hours or 48 hours?

• Null hypothesis - There is no difference in ISI or WAPI between hospitals that have a 24 hour reservation period (n=79) and 48 hour reservation period (n=178).
Crossmatch Reservation period – 24 hours or 48 hours?

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean difference</th>
<th>p value</th>
</tr>
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<tbody>
<tr>
<td>ISI</td>
<td>1.01 days higher in 48 hours</td>
<td>0.02</td>
</tr>
<tr>
<td>WAPI</td>
<td>1.32% higher in 48 hours</td>
<td>0.04</td>
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</table>

Both p values are < 0.05

Mean difference in ISI and WAPI for hospitals that have a 24 hour reservation period is significantly lower compared to hospitals with a 48 hour reservation period
Method of calculating quantity of blood for blood ordering

• Null hypothesis- there is no difference in mean ISI and mean WAPI between hospitals that use computer calculation and those that use visual review
## Method of calculating quantity of blood for blood ordering

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Sample Size</th>
<th>Mean Difference</th>
<th>P value</th>
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</thead>
<tbody>
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<td>ISI</td>
<td>Calculations n=68, Visual Review n=34</td>
<td>-1.7 days</td>
<td>0.02</td>
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<tr>
<td>WAPI</td>
<td>Calculations n=68, Visual Review n=34</td>
<td>-3.72%</td>
<td>p&lt;0.001</td>
</tr>
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</table>

P< 0.05 for both ISI and WAPI.
Mean ISI and WAPI was significantly lower for hospitals that used computer calculation for blood ordering compared to hospitals that used visual review.
Changes in Hospital Practice

- Introduce Stock Management Training
- Reduced inventory levels
- Introduce stock expiring notice board
- Introduce stock rotation
- Introduce stock movement
- Electronic Issue
- 24hr crossmatch reservation

NHS
Blood Stocks Management Scheme
The Benefits of the Blood Stocks Management Scheme

• Ensures proper monitoring of a freely given resource
• Improves the interface between supply and demand
• Increases awareness of blood inventory management
• Facilitates a better understanding between hospitals and blood services