Better Use of Data: AIM II

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Blood Stocks Management Scheme
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Overview

• Setting the scene:
  – using benchmarking data to support Patient Blood Management

• Potential benefits
  – Both theoretical and some real evidence

• AIMII
  – What is it and what’s required

• Where are we with the trial
Patient Blood Management

• Patient blood management (PBM) a strategy that looks to reduce the number of allogeneic transfusions and improve the quality of care to patients
  (Lori Alexander – AABB)

• A multi-threaded approach of which one key step is to understand and measure where blood and products are going
Setting the Scene

Benchmarking

‘To improve one’s own performance by comparing yourself with and learning from others who have achieved high standards of care’

Should be structured, continuous and collaborative with the aim of continuous quality improvement

Apelseth et al 2012 Benchmarking: Applications to Transfusion Medicine *Transfusion Medicine Reviews* in press
Benchmarking

- Is comparative
  - Local level – hospitals within a trust
  - Regional level – hospitals within an RTC
  - National level
  - International level
- Seeks to improve practice
How can we find out how blood is being used?

- By time consuming retrospective studies or prospective audits
- Or by asking transfusion teams for anecdotal information
- Or by using information produced for recharging cost of blood transfusion to clinical areas
How to access the data

- We know where the data is – Notes, LIMs, PAS
- Patient level transfusion data is needed to determine meaningful and appropriate use.
- How to we get at it

It’s in there somewhere…
Potentially - What will it Achieve

- Would enable easy comparisons between sites undertaking the same / similar procedures

- Easy availability of such data in a timely fashion should hopefully lead to improvements in blood utilisation
Hypothetical benchmarking

Blood and blood component use in coronary artery bypass surgery

This hospital has:
- Pre op anaemia management pathway
- Uses IV tranexamic acid
- Uses TEG to guide coagulopathy treatment
- Has strict post operative transfusion trigger
Hypothetical benchmarking

Comparison of use of red cells in primary hip replacement

This hospital has:
- a pre op anaemia management pathway
- uses IV tranexamic acid to cover surgery
- has a strict post op transfusion trigger
Evidence for Benchmarking

- In practice is there any evidence that benchmarking such as described brings about increased optimisation of blood.
- Work began in Finland in 2002 on a collaboration between the Finnish Red Cross Blood Service and the major Finnish hospitals.
- Next slide shows data on RBC usage during primary hip replacement.
Initially, a 7 fold difference in highest to lowest use is reduced to a 2.4 difference at 4 years.
Theory into practice

- So how do we get the benefits demonstrated from the experience in Finland.

- AIMII could provide a possible solution (Appropriate Inventory Management module 2) has been developed by ABC to look at the detail of blood utilisation including benchmarking between hospitals.
AIM II – Data Mining

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 (no patient identifiable features)

Dataverse hosted by ABC (in trial)

Analysis and reports
<table>
<thead>
<tr>
<th>Data Elements for Blood Utilization Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient ID (encrypted)</td>
</tr>
<tr>
<td>• Date of admission and discharge</td>
</tr>
<tr>
<td>• Year of birth</td>
</tr>
<tr>
<td>• Gender</td>
</tr>
<tr>
<td>• Healthcare Resource Group (HRG)</td>
</tr>
<tr>
<td>• Ordering physician</td>
</tr>
<tr>
<td>• Directorate</td>
</tr>
<tr>
<td>• Mortality Flag</td>
</tr>
<tr>
<td>• Transfusion yes or no?</td>
</tr>
<tr>
<td>• Date and time of transfusion</td>
</tr>
<tr>
<td>• Transfused component</td>
</tr>
<tr>
<td>• Donation number</td>
</tr>
<tr>
<td>• Product code</td>
</tr>
<tr>
<td>• Expiry date</td>
</tr>
<tr>
<td>• Pre and post transfusion results</td>
</tr>
<tr>
<td>• Adverse events</td>
</tr>
</tbody>
</table>

HRG – Healthcare Resource Group – grouping consisting of patient events that have been judged to consume a similar level of resource
Data Elements - AIMII

- The data will be downloaded and analysed by month, the most recent data will be about 45 days old, since this is the time that Trusts require to complete the coding information recorded in PAS.

- The expiry date will allow for analysis of age of blood at time of transfusion.

- For the trial, the HRG code has been selected since this is the format most similar to the US equivalent used in AIM II: the MS-DRG (Diagnosis – related group).

- Adverse events are not currently recorded in LIMS or PAS systems in UK.
Progress with the Trial...(12 months in)

- A one month dataset has been extracted and uploaded by ABC from all four trial sites
- Validation of that uploaded dataset has been done by one site only
  - Two sites are still in talks
  - One site has stalled
- The follow on 24 month dataset collation has yet to be completed.
Challenges

- Time and resource from Blood bank manager, Laboratory and LIMS IT specialists
- Matching the data between LIMS and PAS (easier if there is a data warehousing facility)
- HRG coding is not ideal

Next Steps

- Benchmarking of data between trial sites and internationally (USA, Sanguin)
- Incorporate coded reason for clinical use chosen at time of request by clinician
- Future roll out will depend on the success of the trial and the size of the hurdles to be overcome
# Benchmarking List for the AIM II Trial

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Procedure</th>
</tr>
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</table>
| Primary hip replacement  
Revision hip replacement  
Repair fractured hip                                                     | Variceal upper GI haemorrhage  
Non-variceal upper GI haemorrhage  
Anterior resection  
Oesophagectomy  
Gastrectomy  
Whippets / pancreatectomy  
Nephrectomy  
Cystectomy  
Radical prostatectomy  
Caesarean section elective  
Abdominal aortic aneurysm (open)                                          |
| Primary coronary artery bypass grafting  
Redo coronary artery bypass grafting  
Coronary artery bypass grafting plus other procedure                      | Haematological malignancy  
Non-malignant haematology                                                  |
| Paediatrics  
Neonatal disorders                                                        |                                                                           |
One month data
Platelet Use in 1 UK hospital by HRG Chapter
### 1 month’s data RBC in hips and knees

#### International Diagnosis Metrics

<table>
<thead>
<tr>
<th>International Diagnosis</th>
<th>Count of Patients My Hospital - Transfused</th>
<th>Count of Patients My Hospital - Not Transfused</th>
<th>% Patients My Hospital Transfused</th>
<th>% Patients My Hospital Not Transfused</th>
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<tbody>
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<td>50.00%</td>
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<tr>
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<tr>
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<td>100.00%</td>
</tr>
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<td>14</td>
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<td>100.00%</td>
</tr>
</tbody>
</table>

#### Hospital: XXXX Hospital

- **Month of Discharge:** October 2010
- **HB21B:** Major Knee Procedures for non-Trauma Category 2 without CC
- **HB21C:** Major Knee Procedures for non-Trauma Category 2 with CC
- **HA12B:** Major Hip Procedures Category 1 for Trauma with CC
- **HA12C:** Major Hip Procedures Category 1 for Trauma without CC
- **HA13A:** Intermediate Hip Procedures for Trauma with Major CC
- **HA13B:** Intermediate Hip Procedures for Trauma with Intermediate CC
- **HA13C:** Intermediate Hip Procedures for Trauma without CC
1 month data
RBC Tx CABG in 1 UK hospital

Month of Discharge: October 2010
Hospital: XXXX Hospital

<table>
<thead>
<tr>
<th>International Diagnosis</th>
<th>Metrics</th>
<th>Count of Patients My Hospital - Transfused</th>
<th>Count of Patients My Hospital - Not Transfused</th>
<th>% Patients My Hospital Transfused</th>
<th>% Patients My Hospital Not Transfused</th>
</tr>
</thead>
<tbody>
<tr>
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<td>59.09%</td>
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<tr>
<td>EA16Z</td>
<td></td>
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<td>0</td>
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<td>0.00%</td>
</tr>
</tbody>
</table>

Report Filter:
(Hospital = XXXX Hospital) And ((International Diagnosis Type) = NHSBT) And ((Month of Discharge) = October 2010) And ((International Diagnosis) = EA14Z:Coronary Artery Bypass Graft (First Time), EA15Z:Coronary Artery Bypass Graft (First Time) with Cardiac Catheterisation, EA16Z:Coronary Artery Bypass Graft (First Time) with Percutaneous Coronary Intervention, Pacing, EP or RFA)
To enable participation in national benchmarking scheme

- Electronic order communications with menu-driven coded reason for transfusion request
- Electronic blood tracking (ideal)
- Trust data warehouse
- LIMS system that supports data retrieval appropriately
- Sufficient IT resource in transfusion, haematology and Trust IT
- Buy in from Trust executive team
Acknowledgements

• Transfusion and IT teams from:
  – Oxford University Hospitals NHS Trust
  – University Hospital South Manchester NHS Foundation Trust
  – Newcastle upon Tyne Hospitals NHS Foundation Trust
  – The Dudley Group NHS Foundation Trust

• NHSBT project team

• America’s Blood Centers