Barcode technology to support the safe and effective use of blood in hospitals

Mike Murphy
Professor of Blood Transfusion Medicine,
University of Oxford
Consultant Haematologist, National Blood Service/Oxford Radcliffe Hospitals

Challenges for hospital transfusion

• Patient safety
• Effective use of blood
• Robust audit trail and documentation
• Rapid availability
• Good blood stock management and low wastage
SHOT reports analysed 1996-2006 (n=3770)

Distribution of errors in IBCT 1996/97-2003 (number of cases=1393, number of errors= 2340)

- Unknown (<1%)
- Other (1%)
- Blood Centre (2%)
- Prescription, sampling, request (20%)
- Hospital Blood Bank (29%)
- Collection, administration (48%)
Estimated overall % inappropriate red cell transfusion
Data from large audit in Northern Ireland
www.rmagni.gov.uk/publications/ni_blood_transfusion_audit.pdf

Appropriate 79%
Inappropriate 21%

Barcode technology to improve the safety and effectiveness of transfusion

Objective
End-to-end electronic control of the hospital transfusion process

Strategy for each phase to demonstrate effectiveness
• Baseline audit of practice
• Development of new approach with clinical team and commercial partners
• Training and implementation
• Re-audit
Initial state of patient identification

Audit of 55 transfusions in Oxford in 2001

• 5 patients were not asked for any verbal ID
• Of the 50 who were asked for some verbal ID, this was mostly only date of birth
• In 35, this information was not checked with any written documentation
• 6 patients did not have a wristband
• ID on the patients’ wristbands were not checked before any of the transfusions
SafeTx

Simply follow the screen prompts
Compliance with pre-transfusion bedside checking in the haematology inpatient ward

(Transfusion 2003;43:1200-1209)

[Graph showing compliance levels before and after training and barcode ID introduction]
BloodTrack Courier

Simply choose In or Out.
BloodTrack Courier

On screen instructions with audio prompts

‘Intelligent blood fridges’
9 drawer fridge (only one drawer opens - the right blood group for the patient)
‘Intelligent blood fridges’
(only the correct unit for the patient is delivered)
Remote Issue: the next step

- Electronic issue of blood allows the safe release of blood without a test of patient’s serum/plasma v. donor red cells by using the blood bank computer to ensure that certain criteria are met.
- ‘Remote issue’ allows the issue of unallocated blood from blood fridges remote from the blood bank by an electronic query of blood bank records and the printing of a compatibility label.
- Potential major benefit for blood banks serving multiple sites (as in Oxford) or a region.

Electronic traceability of blood
Challenges of moving from pilot to implementation

- Obtaining clinical and senior management ‘buy-in’
- Funding
- Project management
- Infrastructure requirements
- Training of large numbers of staff
- Developing mechanisms for monitoring progress
Project manager’s viewpoint!

• It has been really interesting!
• The Trust have some serious financial challenges…….. announced 600 job losses during phase 1
• Management focus is therefore elsewhere……
• The Head Nurse (senior management champion of the project) left during phase 1
• There was no wristband policy
• We are also competing with other major projects in the Trust

Back at base…the project implementation team
Implementation of the electronic system for blood sample collection in Oxford

Implementation of the electronic system for blood administration in Oxford
Use of wireless to enhance functionality

To add clinically helpful features and improve processing and availability of data:-

• data can be downloaded from the handheld direct to the blood transfusion computer
• blood count information from pathology can be delivered in real time to the handheld unit, supporting decision making at the bedside

Current activities and future plans

✓ Whole hospital implementation completed
✓ Regional implementation of blood tracking
✓ National specification produced for transfusion
✓ Supporting CfH/NPSA pilot at Mayday Hospital
  • Decision support for blood ordering
  • Consider development for medicines management and pathology
• Link to Blood Service IT for ordering of blood
• Rethink way transfusion services are provided
Government Computing Award for Innovation 2007