NHS Blood Stocks Management Scheme

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NHS Trust

Clinical Use of Blood
The AIM II Trial

Challenges of “Near-Live” Organisational Blood Use Monitoring

Goals for AIM

- Assist hospitals in complying with timely metric driven standards
- Create an inclusive approach to blood management
- To reduce costs of blood by tracking Key Performance Indicators (KPIs)
- Providing reports with national (and international) benchmarking to reveal evidence based best practice

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How can we find out how blood is being used at the moment?

National Comparative Audit of Blood Transfusion

NHS Blood and Transplant

ons for transfusion and estimates of
rs in hospitals supplied by the

ard,‡ A. J. Johnson,§ M. Amin,† S. Ballard,† J. Buck,†
illiamson** *NHS Blood and Transplan
IC) Clinical Studies Unit, NHSBT, Cambridge,
ersity of Oxford/NHSBT, Oxford, UK, and **D

National Comparative Audit of Blood Transfusion

NHS Blood and Transplant

2010 Re-audit of the Use of Platelets in Haematology

April 2011

ns for red cell transf
in the North of England

J. P. Wallis,* A. W. Wells† & C. E. Chapman† on behalf o
Committee *Department of Haematology, Freeman Hospital, and †National Blood S

Received 3 May 2006; accepted for publication 21 July 2006

National Comparative Audit of the Use of Fresh Frozen Plasma

Full Report

February 2009

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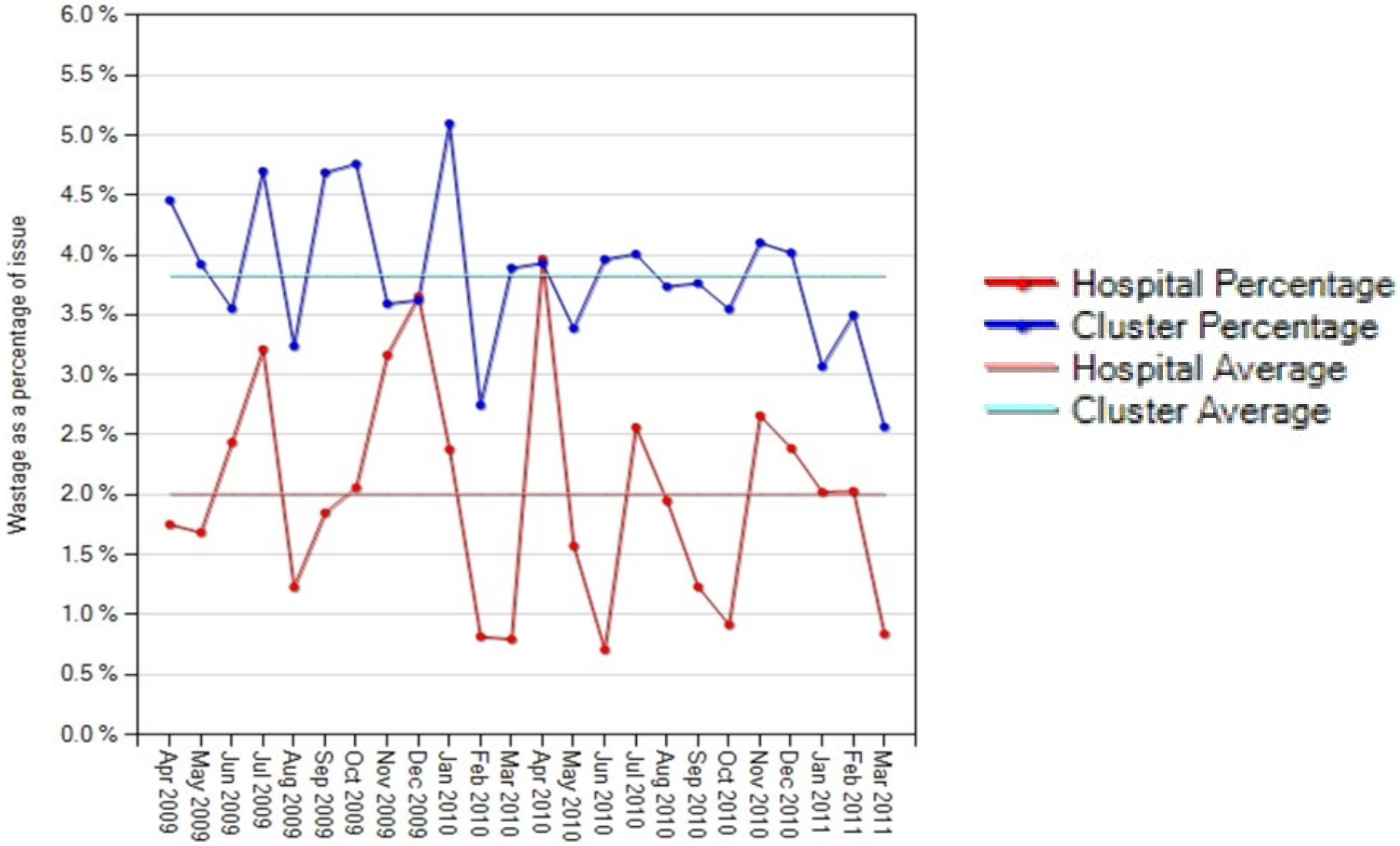
Better information on stock management and wastage.....

- Intelligence on blood inventory management gathered from across the blood supply chain
- Stock and wastage levels
  - Red cells
  - Platelets
- Benchmarking
- Transparency of data
- Significant improvements in inventory management

O Neg


Wastage as a percentage of issue
6.0 %
5.5 %
5.0 %
4.5 %
4.0 %
3.5 %
3.0 %
2.5 %
2.0 %
1.5 %
1.0 %
0.5 %
0.0 %
Apr 2009
May 2009
Jun 2009
Jul 2009
Aug 2009
Sep 2009
Oct 2009
Nov 2009
Dec 2009
Jan 2010
Feb 2010
Mar 2010
Apr 2010
May 2010
Jun 2010
Jul 2010
Aug 2010
Sep 2010
Oct 2010
Nov 2010
Dec 2010
Jan 2011
Feb 2011
Mar 2011
Hospital Percentage
Cluster Percentage
Hospital Average
Cluster Average

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RTC Quarterly Hospital RBC/PLT Issue Report

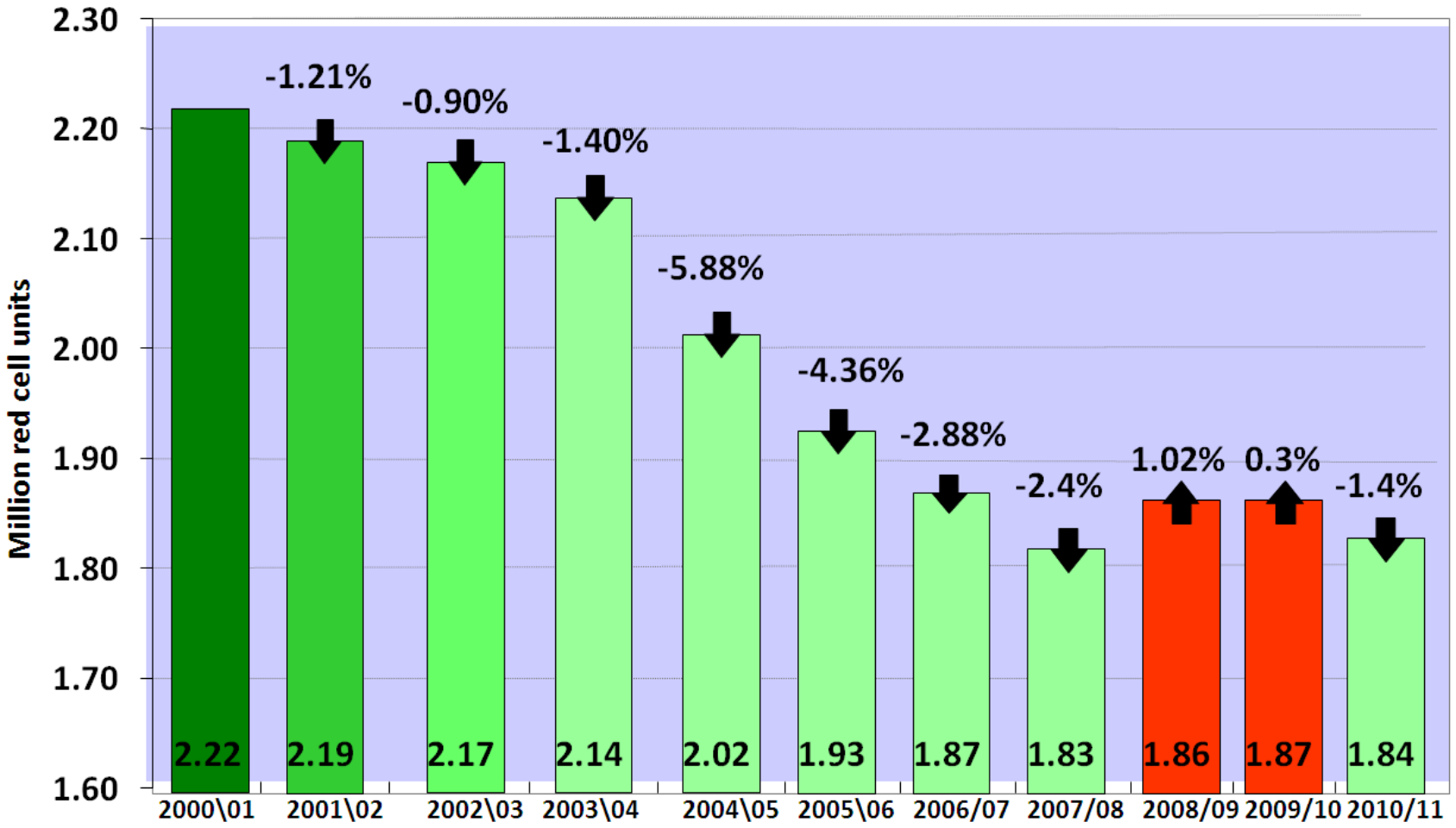
RTC Regional Blood Group Distribution Data **

O Pos	O Neg	A Pos	A Neg	B Pos	B Neg	AB Pos	AB Neg
36.9%	7.9%	34.8%	7.7%	7.7%	1.5%	2.8%	0.6%

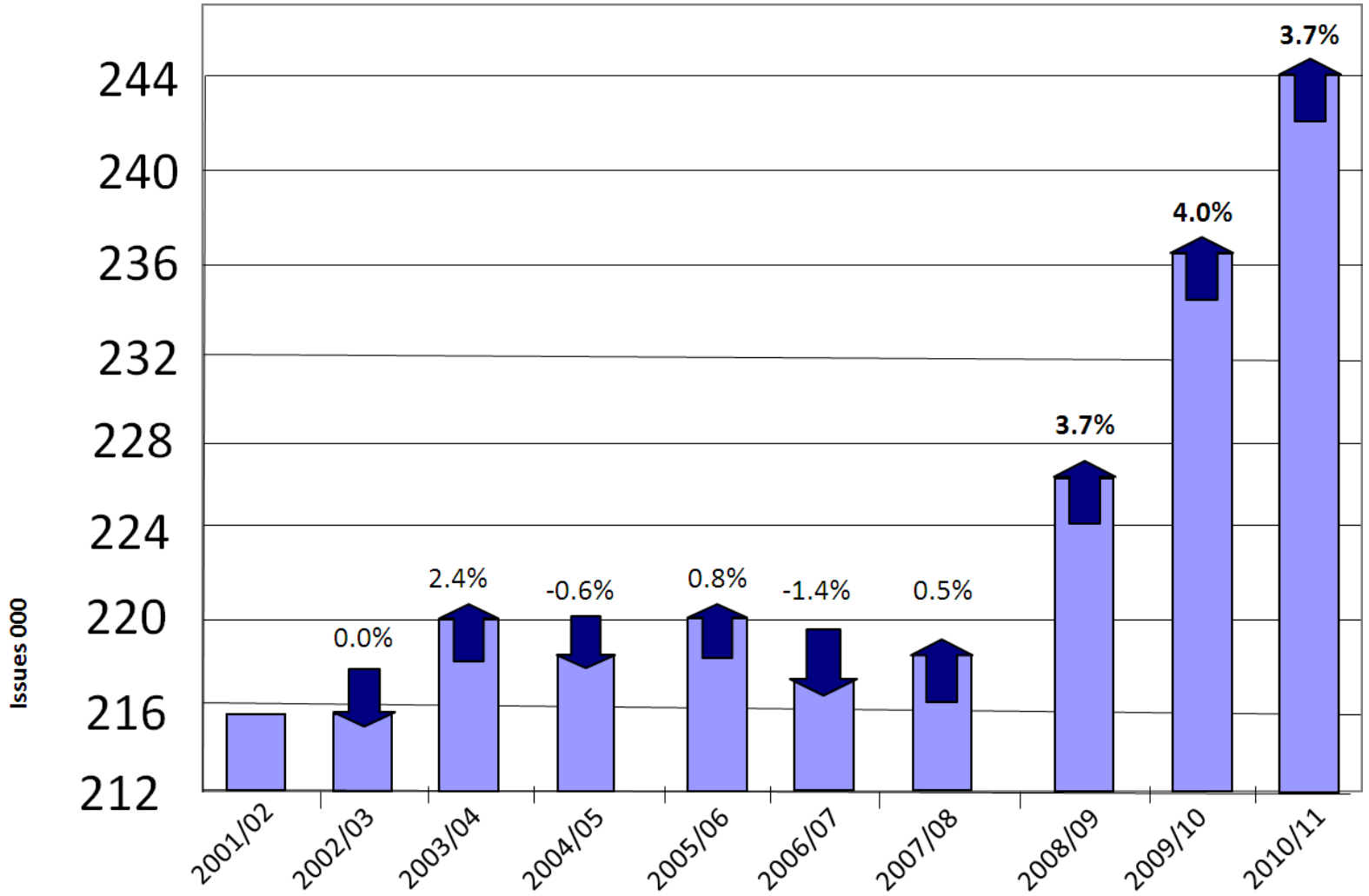
Issues from NHSBT for :- 2010/11 Q2

Hospital Details	Red Cell Issues from NHSBT Centres										RBC Stock Move		Issues	PLT Stock Move	
Hospital Name	O Pos	O Neg	A Pos	A Neg	B Pos	B Neg	AB Pos	AB Neg	All RBC's	% O Neg	Corrected	Total	All PLT's	Corrected	Total
Hospital	712	219	736	199	102	71	49	27	2,115	10.4%			245		
Hospital	539	170	595	161	127	18	49	0	1,659	10.2%			86		
Infirmary	1,392	395	1,367	352	333	70	90	32	4,031	9.8%	4,032	Move	1,146		
Hospital	1,174	301	965	304	215	81	67	32	3,139	9.6%	3,135	Move	203		
Hospital	889	202	742	179	108	44	34	18	2,216	9.1%			138		
Hospital	1,532	326	1,306	255	293	92	82	34	3,920	8.3%	3,919	Move	375		
Hospital	729	172	806	159	112	53	41	17	2,089	8.2%	2,133	Move	259		
Hospital	861	171	677	113	162	42	43	9	2,078	8.2%			147		
Hospital	893	183	720	147	157	38	72	34	2,244	8.2%			344		
Hospital	477	104	430	129	86	46	27	18	1,317	7.9%			38		
Hospital	447	86	371	72	121	19	0	0	1,116	7.7%			37		
Data	16,258	4,603	15,008	3,813	2,942	942	855	353	44,774	13.9%			4,839		

Red Cell Demand in England & N Wales



Platelet Demand in England & N Wales



'Appropriate Inventory Management' (AIM) Overview

Phase I (Module1)

- BSMS source code provided by NHSBT
- Collaboration between NHSBT/America's Blood Centres (ABC)
- American name: AIM I (Appropriate Inventory Management – Module I)

Phase II (Module 2)

- Goal: for vein to vein monitoring of blood components (AIM II)
- Blood utilisation management requires patient level transfusion data in order to determine meaningful and appropriate use

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Trial of AIM II in England: Trial in collaboration with 4 hospitals

- Present overview of system to hospital teams to enable evaluation of the resources required
- Evaluate the AIM II system functionality, assessing the “fit” for collection of blood use data
- Work with hospitals to establish data extraction & submission procedures
- Goal: a monthly data submission and reporting
- Benchmarking reports provided to hospitals

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AIM Hospital Profile

Hospital Name:

Hospital System Name (if applicable):

Supplied by:

Hospital Clinical Categories

This information will be entered onto AIM so that each hospital can compare data sets with hospitals having a similar profile.
√ to add (a tick indicates hospital belongs to a category).
Leave blank if category does not apply to hospital.

Category	Details	Please √
Bed Size I	≤100 patient beds available	
Bed Size II	>100 ≤300 patient beds available	
Bed Size III	>300 ≤ 500 patient beds available	
Bed Size IV	>500 patient beds available	✓
Trauma Services	Major Trauma Centre	✓
Trauma Services	24 hour Accident and Emergency facility. (Minor injury units are not counted as an Accident and Emergency facility)	
Neonatal Intensive Care	Level II or III (As defined by the British Association of Perinatal Medicine)	
Children's Hospital	Specialises in paediatric services	
Teaching Hospital	Medical school is either attached or affiliated	✓
District General Hospital	District General Hospital	
Private Hospital	Independent facility	
Cardiac Services	Cardiothoracic surgical procedures provided	
Hematology/Oncology Services	Cancer patient care provided	✓
Renal Services	Dialysis provided	
Neurological Services	Neurological surgical procedures provided	
Obstetric Services	Women's health servces provided	
Orthopaedic Services	Orthopaedic surgery provided	✓
Blood Conservation Program	Facility has implemented a blood conservation program	
Ambulatory/Day Surgery	Provides outpatient surgery services	
Electronic Crossmatch	Transfusion Service uses electronic crossmatches	
Intra/Post-Operative Cell Salvage	Cell salvage utilized routinely	
Transplant, Heart/Lung	Facility provides heart/lung transplants	
Transplant, Liver	Facility provides liver transplants	
Transplant, Bone Marrow	Facility provides bone marrow transplants	✓
Transplant, Pancreas	Facility provides pancreas transplants	
Burn Care Services	Burn injury services provided	
Supply Crossmatched	Provide blood to other hospitals that is crossmatched	✓
Zone 1	0-15 miles from supplier (category assigned by BSMS)	
Zone 2	16-30 miles from supplier (category assigned by BSMS)	
Zone 3	31-45 miles from supplier (category assigned by BSMS)	
Zone 4	46-90 miles from supplier (category assigned by BSMS)	
Zone 5	91-120 miles from supplier (category assigned by BSMS)	
Zone 6	>120 miles from supplier (category assigned by BSMS)	
Annualized Platelet Usage (count random pools as dose equivalent)	Very High (>401), High (201-400), Moderate, (51-200) Low (11-50), Very Low (0-10) (category assigned by BSMS)	
Annualized Red Blood Cell Usage (count all red cell products)	Very High (>4001), High (1601-4000), Moderate (801-1600), Low (251-800), Very Low (0-250) (category assigned by BSMS)	

Data Elements for Blood Utilisation Analysis

DATA ELEMENT -	TRANSF	ID	DOA	DC
Definition	transfusion	encrypted patient ID #	date of admission	date of discha
Value	alpha (YES, NO)	alphanumeric	date (Month/Day/ Year)	(Month/
Required	yes	yes	yes	yes
Comments	YES or NO for each record for each unique ID	Patient records should not include unique identifiers to ensure HIPAA compliance. Repeats for each record for a unique patient	Ex: 06/16/2009	Ex: 06/16/2

- Transfusion yes or no?
- Patient ID (encrypted)
- Date of admission and discharge
- Year of birth
- Gender
- Healthcare Resource Group (HRG)
- Date and time of transfusion
- Transfused component
- Pre transfusion lab test result
- Donation number and product code
- Expiry date

Data elements for transfusion outcome evaluation

DATA ELEMENT -	MORT_FLAG	ORD_PHY	PHY_SVCLN	POSTOP_INFECT	DVT	SIGN_SYMP	TRANS_REACT	TXRX_SEVERITY	TXRX_IMPUTABILITY	POSTTX_INFECTION	POSTTX_INFIMPUT	POSTTX_INFSEVERITY	Re_ADMT
Definition	mortality flag	Ordering Physician	Ordering Physician Service Line	post-op infection flag	deep vein thrombosis flag	transfusion reactions signs and symptoms	transfusion reactions	Transfusion Reaction Sev					Re-
Value	YES NO (disposition YES at discharge = death)	Alpha Numeric	0 = None Selected, 2 = Medical Services, 3 = Neonatal Services, 4 = Surgical Services, 5 = Bone Marrow Transplant Services, 6 = Obstetric Services, 7 = Solid Organ Transplant Services, 8 = Cardiology Services, 9 = Neurological Services, 10 = Orthopedic Services, 11= Nephrology Services, 12 = Hematology/Oncology Services, 13 = Radiology Services, 14 = Emergency Services, 15 = Intensive Care Unit Services	YES NO (POA)	YES NO (POA)	Chills/Rigors, Dark urine, Decreased blood pressure, Diffuse Hemorrhage, Fever, Hemaglobinuria, Hemoglobinemia, Hypoxemia, Increase in blood pressure, Jaundice, Nausea/Vomiting, Olilguria, Other Skin Rash, Pain, Pruritis, Shock, Shortness of Breath, Urticaria	AHTR, DHTR, DSTR, Hypotensive, FNHTR, PTP, TACO, TAD, GVHD, TRALI,	Grade 1, Grade 2, Grade 3, Grade 4	Definite, Probable, Possible, Doubtful, Ruled Out, or Not Determined	Bacterial, Viral, Parasitic, or Other	Definite, Probable, Possible, Doubtful, Ruled Out, or Not Determined	Grade 1, Grade 2, Grade 3, Grade 4	alpha (YES, NO)
Required	yes	No	No	no	no	no	no	no	no	no	no	no	no
Comments		Physician ordering the transfusion as opposed to the XM-CPOE	As defined in AIM v1.1- To capture the hospital cost center or specialty area of the physician associated with the transfusion			As defined by the CDC Hemovigilance program	As defined by the CDC Hemovigilance program	As defined by the CDC Hemovigilance program	As defined by the CDC Hemovigilance program	As defined by the CDC Hemovigilance program	As defined by the CDC Hemovigilance program	As defined by the CDC Hemovigilance program	

- Mortality Flag
- Ordering physician
- Directorate

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Patient level transfusion data is needed to determine appropriate use: where are these data?

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Data related to blood use

Data related to blood results

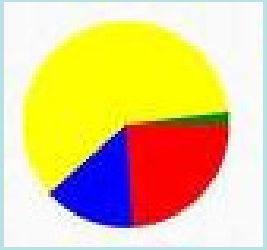
PAS data related to length of stay, consultant, specialty

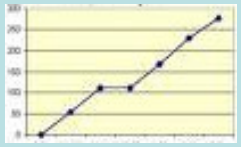
PAS coded data related to transfusion episode (ICD 10 diagnosis code, OPCS4 procedure code)

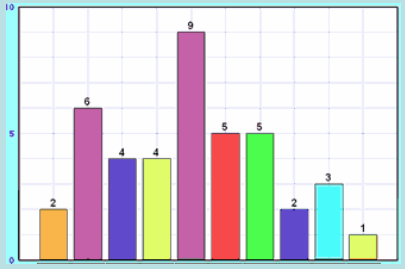
Data mining software extracts relevant data (no patient identifiable features)

Data warehouse hosted by ABC (in trial)

Analysis and reports







So, where do you start??

Challenges

- Who's who?
- Data protection…
- Current organisation
  - Electronic Patient Record
- Disparate data collection methods and systems (silos)
- Asking the wrong questions
- Infrastructure; what happens to the dataset when you have it?
- Maintaining Infrastructure and clinical buy-in
- No two organisations are the same

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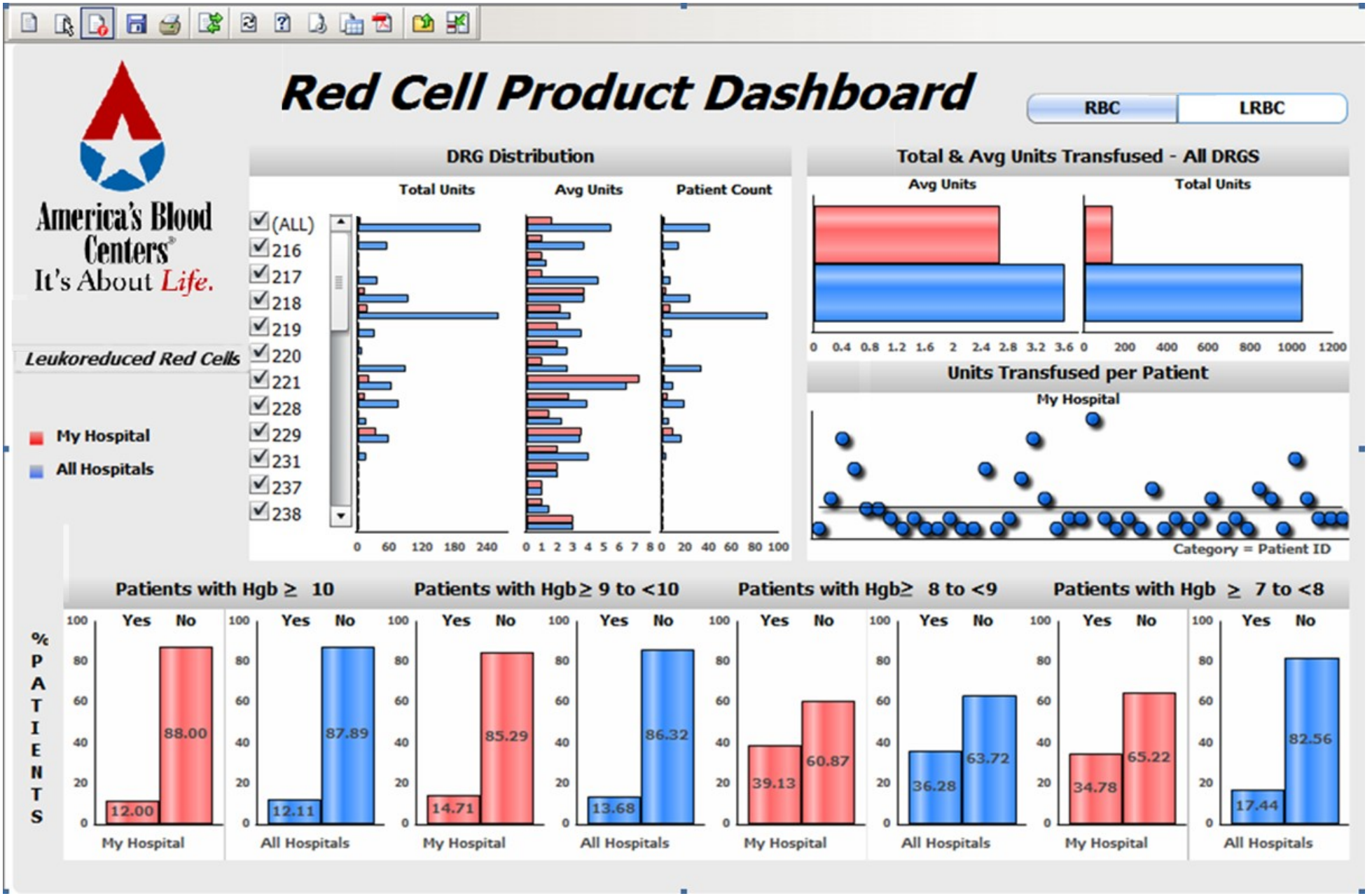

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Platelet Dashboard

Whole Blood | Pooled Whole Blood | Apheresis Platelet

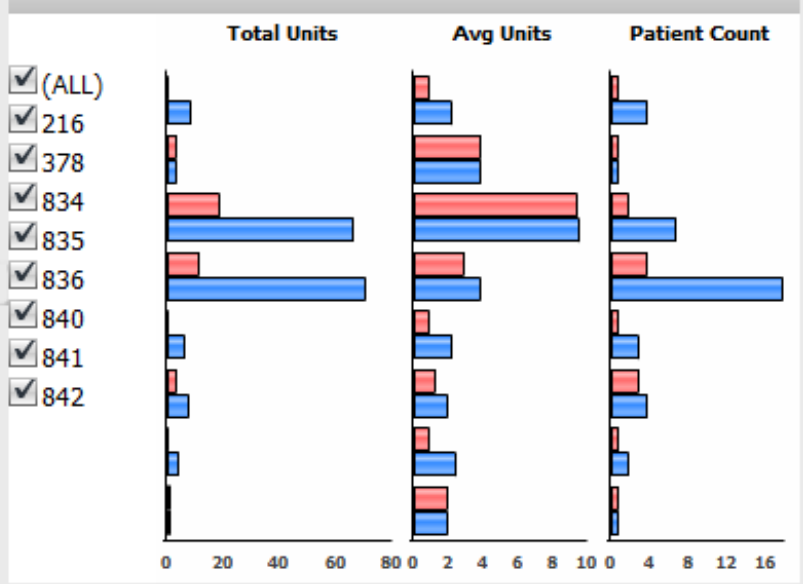
America's Blood Centers® It's About Life.

Apheresis Platelet

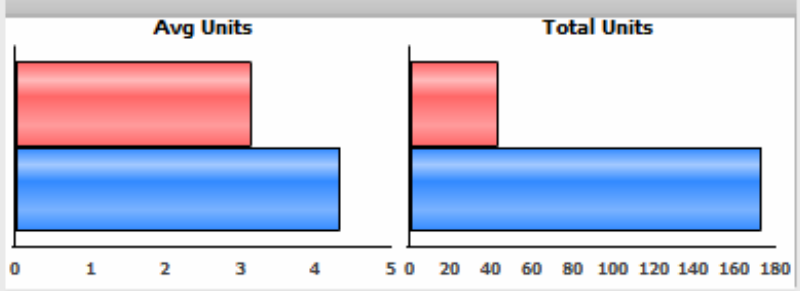
My Hospital

ALL Hospital

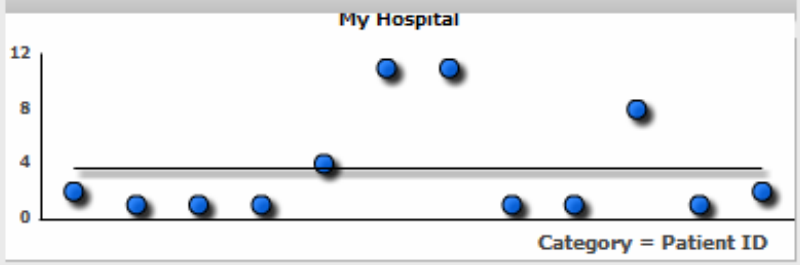
DRG Distribution



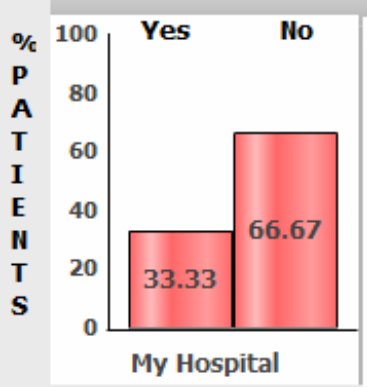
Total & Avg Units Transfused All DRGS

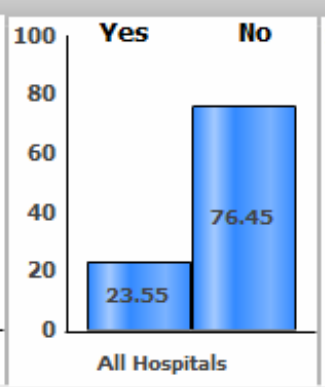


Units Transfused per Patient

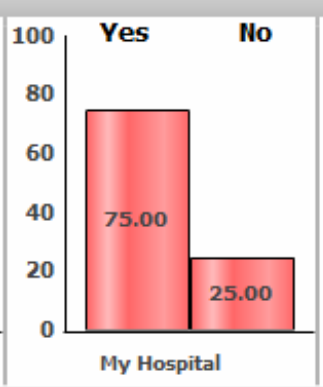


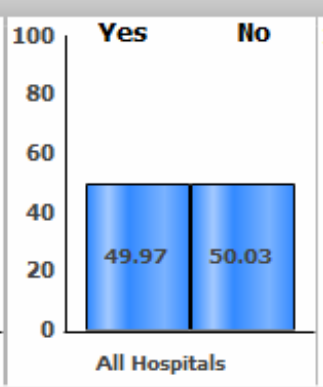
Patients with Plt count < 10K



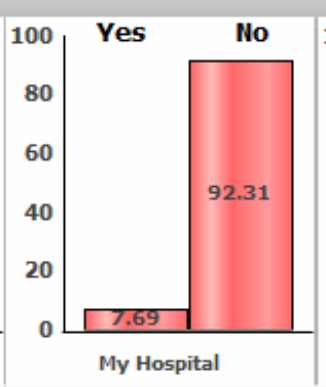


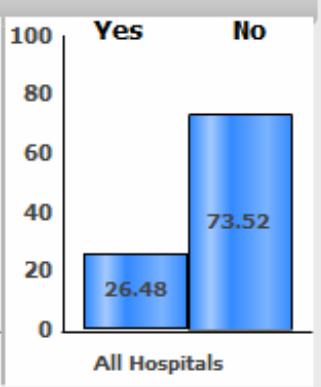
Patients with Plt count ≥ 10K to 50K





Patients with Plt count ≥ 50K





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FFP Product Dashboard

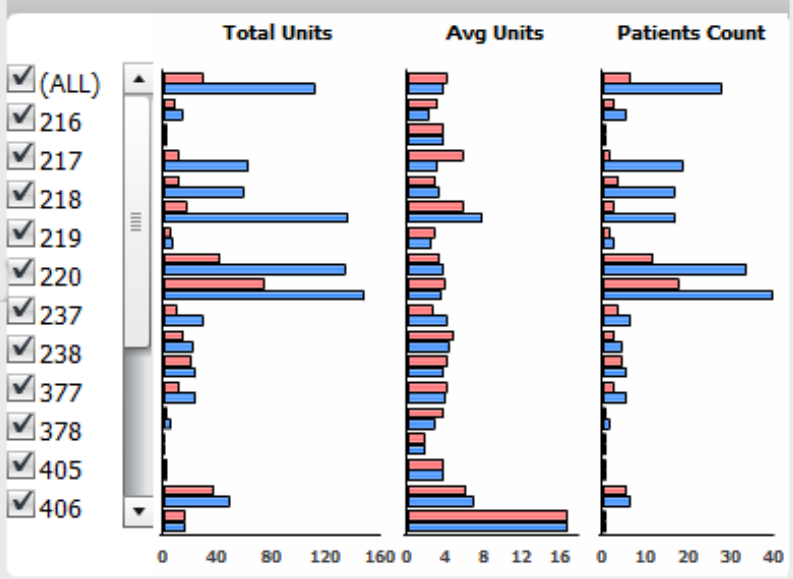
FFP | FFP > 400mL

America's Blood Centers®
It's About Life.

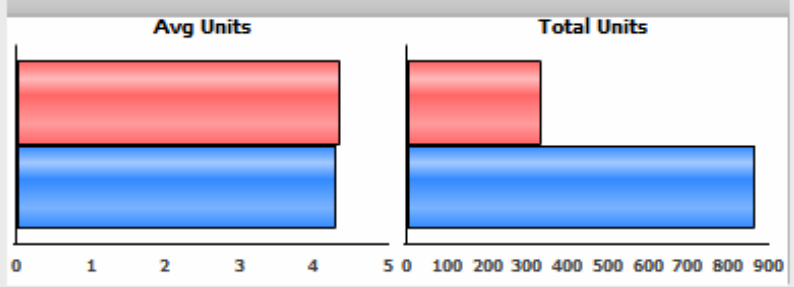
FFP

My Hospital
All Hospitals

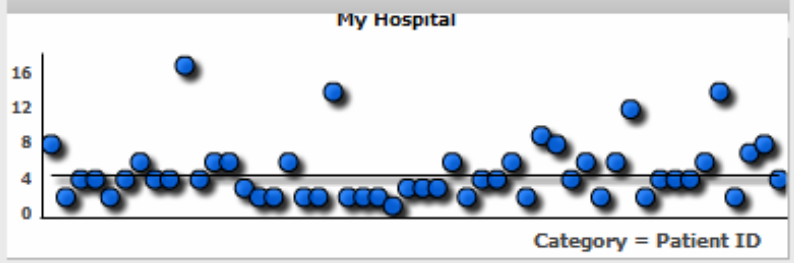
DRG Distribution



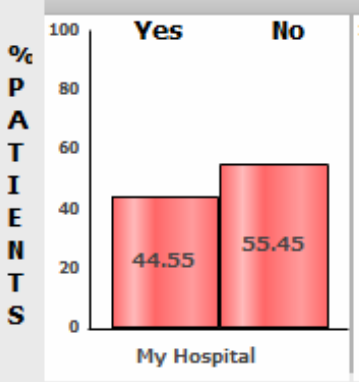
Total & Avg Units Transfused - All DRGS

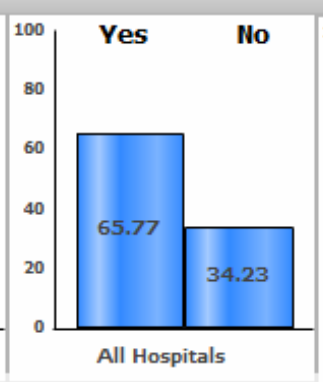


Units Transfused per Patient

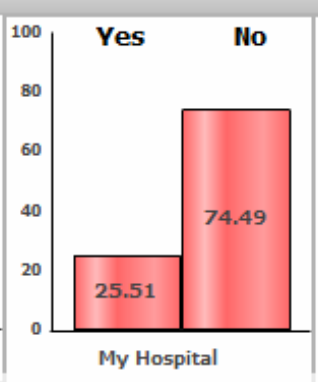


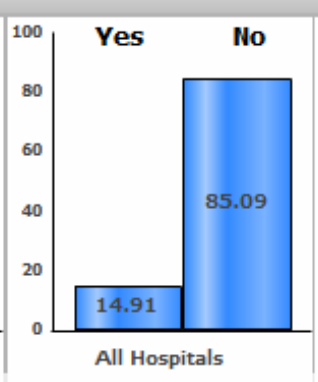
Patients with INR < 1.5



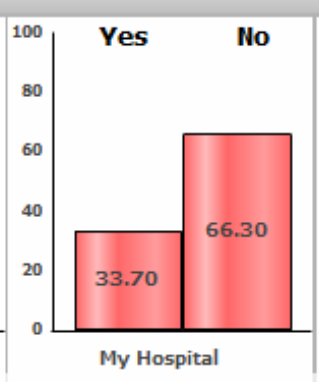


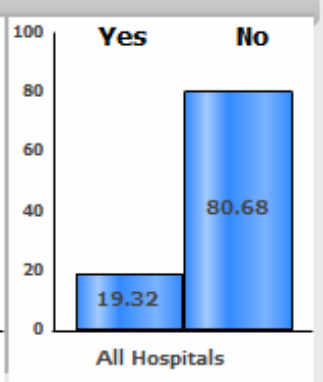
Patients with INR ≥ 1.5 to 2.0





Patients with INR ≥ 2.0





Potential future integration: Recording the clinical reason for blood use

- The use of HRG is the reason for transfusion
  - This is less accurate for medical reasons for transfusion
- AIM II would be more easily targeted if there were a field in LIMS with a coded reason for clinical use
- The code should be from a standardised menu and would be selected by the person requesting the transfusion (ideally by electronic order comms)

Potential benefits of AIM II

- Better understanding of where and why blood is being used.
- Provide hospitals and physicians with benchmarking data.
- At individual hospital level, will be able to establish baseline performance and how it compares to regional, national or international peers
- Springboard for inter-hospital collaborations to identify best practice.

Potential benefits of AIM II

- NHSBT will benefit as knowledge of clinical use will inform strategic planning
  - Ensure sufficiency of supply
  - Maintain appropriate inventory levels to ensure supply meets demand
  - Information to evaluate safety decisions
  - Support emergency planning

Summary

- The goal of AIM II is to assist hospitals and physicians together with NHSBT to better manage and use the available blood supply
- Wide implementation would potentially offer local, regional, national and international benchmarking
- Challenges of data collection and clinical buy-in
- Further development will depend on the outcome of the current trial

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Thank you

Thanks to NHSBT