Patient Blood Management

Engaging Clinicians and Patients
Western Australian Program

UK BBTS Scientific Meeting
Harrogate, 24th September, 2014

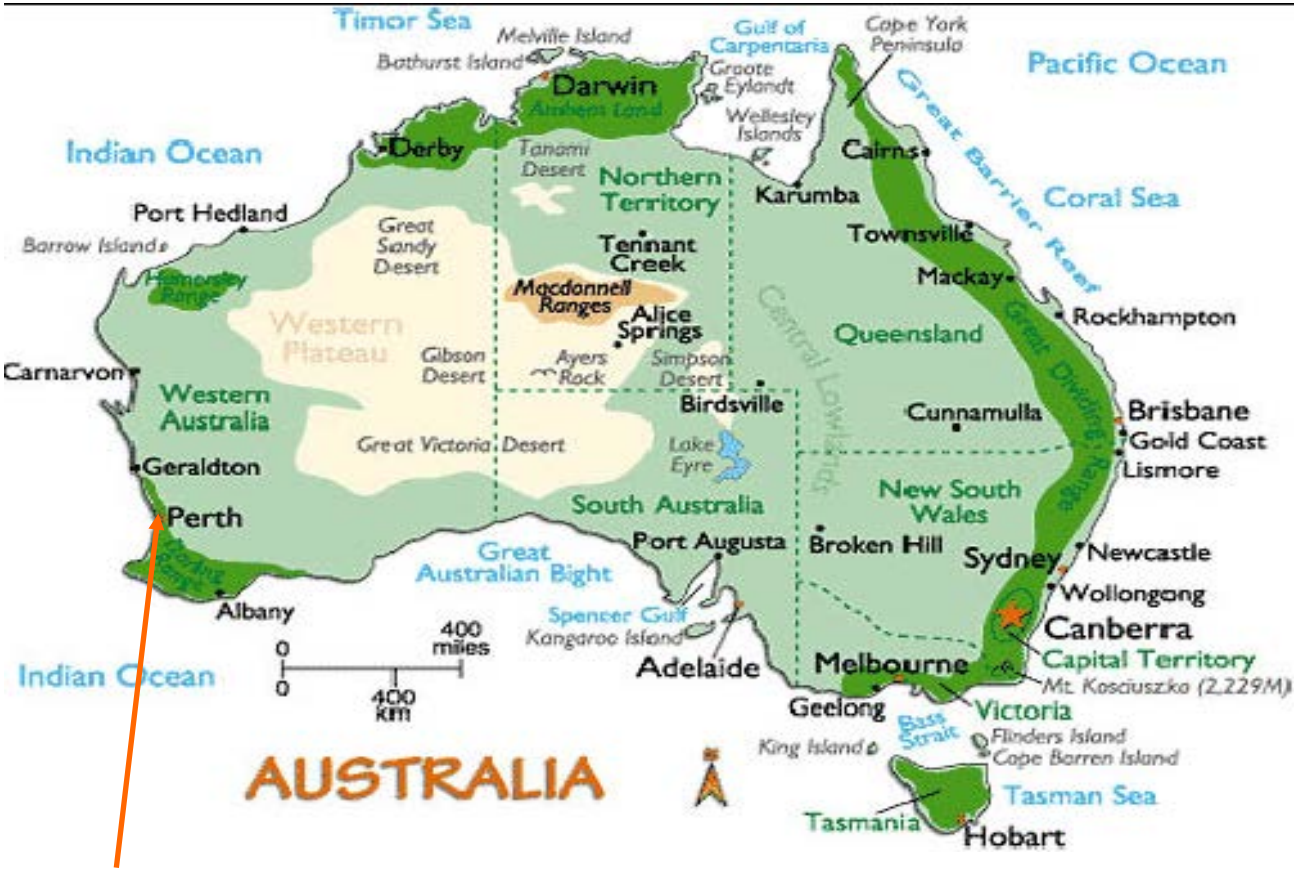
COLLABORATIVE, PATIENT-CENTERED CARE

Affiliations

National Blood Authority (NBA) – *Chair PBMSC*
Australian Red Cross Blood Service (ARCBS) - *Bloodfellow*
WA Department of Health – *WA PBMP*
College of Intensive Care Medicine (CICM) - *Fellow*
ANZCA – *Fellow*
Medical Society for Blood Management *(MSBM)*
Network for Advancement of Transfusion Alternatives *(NATA)*
Society for the Advancement of Blood Management *(SABM)*

Western Australia

Western Australia



77 % or the population resides in the Perth Metropolitan Area

Government of Western Australia
Department of Health

Western Australia

2.5 million square kilometres

Government of Western Australia
Department of Health


NEXT 92 km

Patient Blood Management

Engaging Clinicians and Patients
Western Australian Style

UK BBTS Scientific Meeting
Harrogate, 26th September, 2014

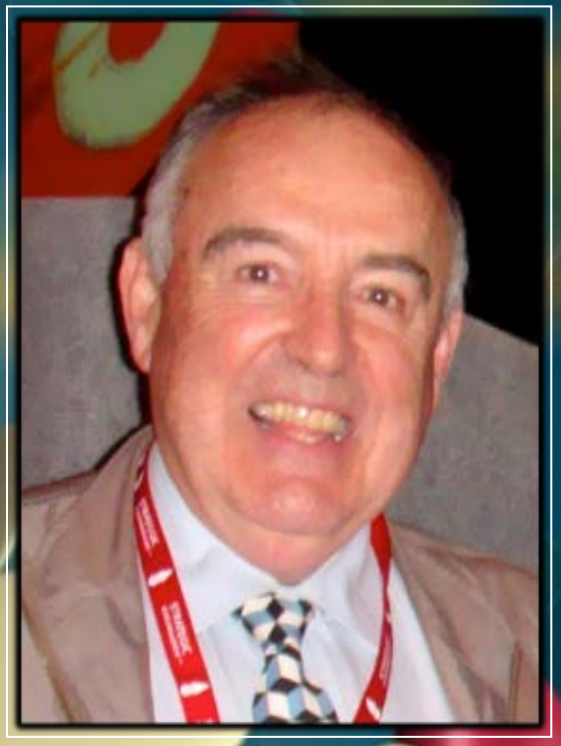
Dr Simon Towler, *FCICM, FANZCA*

Acknowledge my colleagues

What is Patient Blood Management ?

Originator of the term PBM

MJA 1988 Professor ***James Isbister, AM*** proposed the need for a paradigm shift in the care of patients who are being considered for transfusion of fresh blood products.



Clinical Professor James Isbister BSc(Med), MB BS, FRACP, FRCPA.
Emeritus Consultant, Haematology & Transfusion Medicine,
Royal North Shore Hospital, Sydney, Australia.
Clinical Prof of Medicine, University of Sydney, Sydney, Australia;
Adjunct Prof, University of Technology, Sydney, Sydney, Australia;
Adjunct Professor, Monash University, Melbourne, Australia;

What is Patient Blood Management ?

The Medical Journal of Australia

March 21, 1988
Vol. 148, No. 6

JOURNAL OF THE AUSTRALIAN MEDICAL ASSOCIATION

POINT OF VIEW

The paradigm shift in blood transfusion.

James P. Isbister ... 306

March 1988

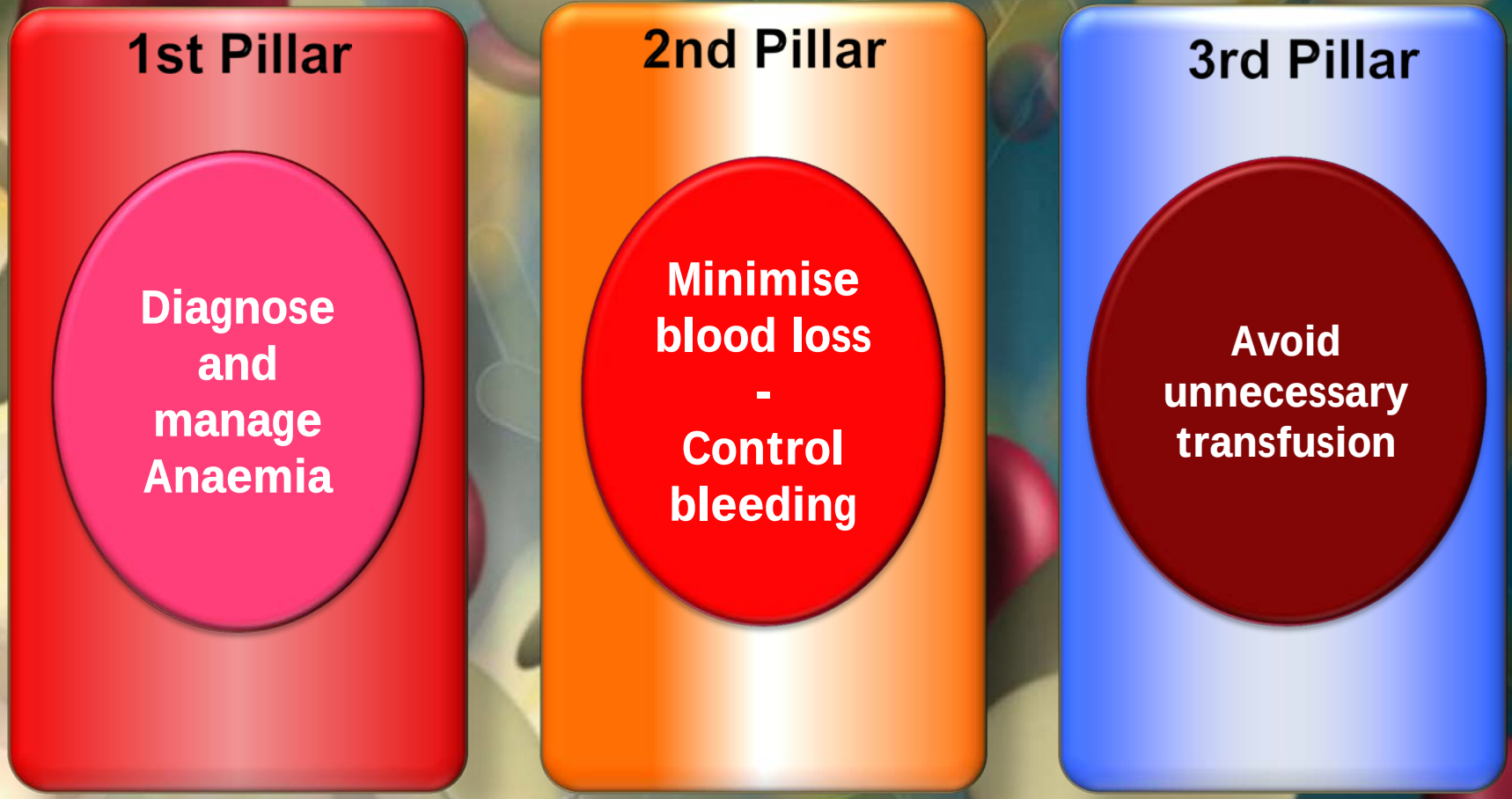
What is Patient Blood Management ?

Put simply,

Patient blood management (PBM) is –

- an *evidence-based*,
- *multidisciplinary* approach
- to *optimizing the care of patients,*
- who *may need allogeneic transfusion*

Patient Blood Management



Multidisciplinary team approach

Why have a Patient Blood Management Program?

Why is such a program an emerging priority for health services?

Five Drivers Shifting the Paradigm from Product-Focused Transfusion Practice to Patient Blood Management

AXEL HOFMANN,[a,b] SHANNON FARMER,[b,c,d] ARYEH SHANDER[e]

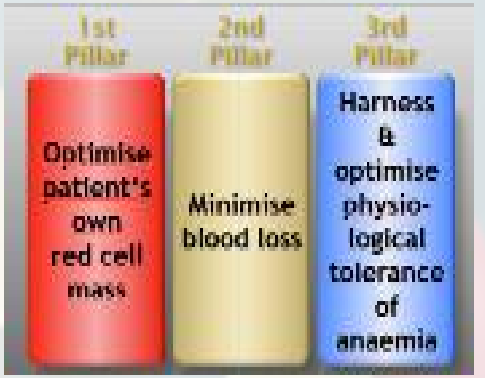
Quality, efficacy & safety issues

Adverse outcome

Infectious risk

Cost

Scarcity



The Oncologist 2011;16(suppl 3):3–11 www.TheOncologist.com

Efficacy of Red Cell Transfusion in the Critically Ill: As Systematic Review of the Literature

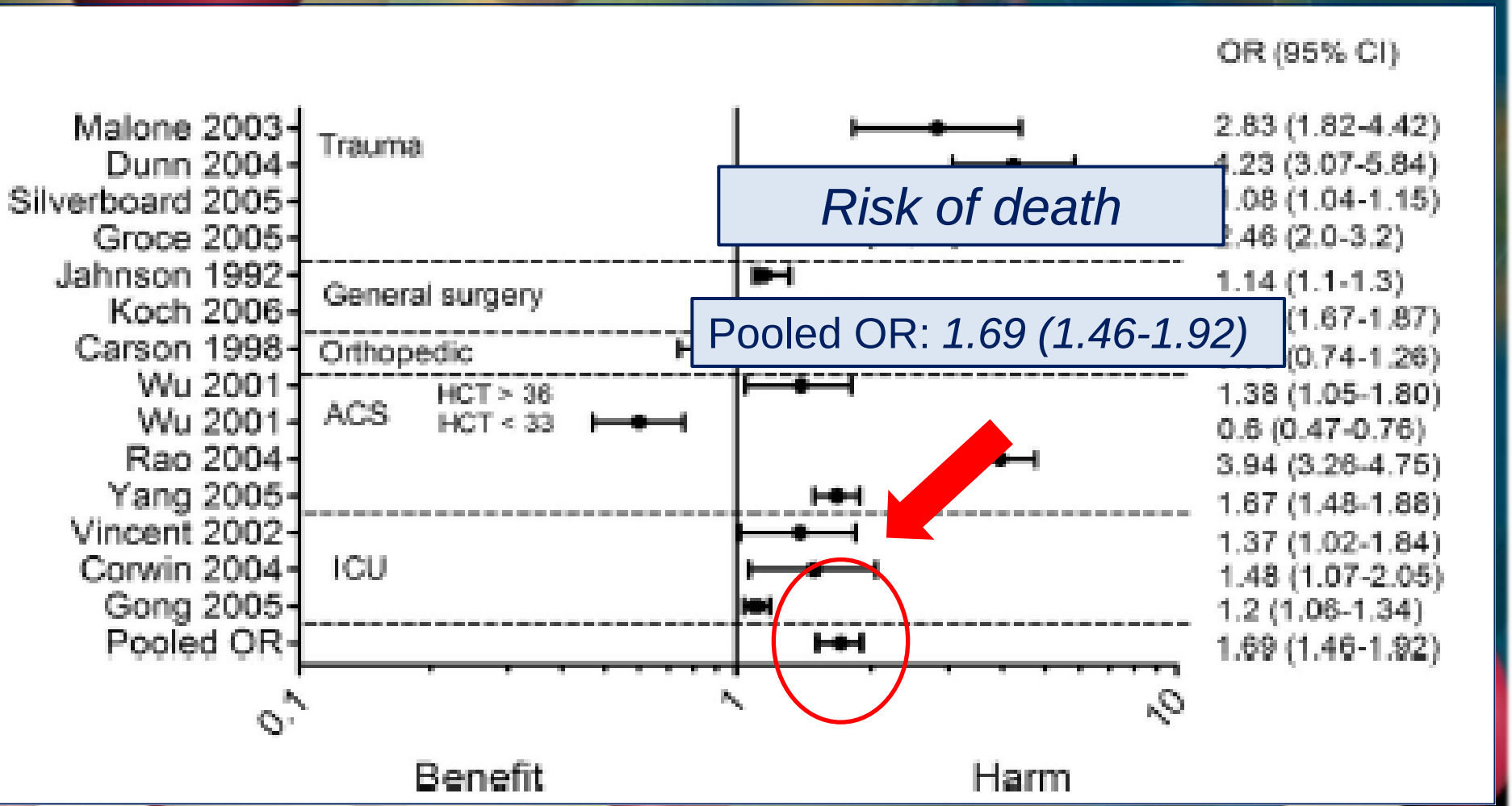
- N = 45 articles reviewed
- Outcome measures: Mortality, Infections, MODS, ARDS
- 42 of the 45 studies showed the risks of RBC transfusion outweighed the benefits
- In adult, ICU, trauma, and surgical patients, RBC transfusions are associated with increased morbidity and mortality

Marik PE.et.al. Crit Care Med. 2008;36(9):2667-74

Slide acknowledgement Prof A Shander

Efficacy of Red Cell Transfusion in the Critically Ill

Association between blood transfusion and the **risk of death:**
(Odds ratio [OR] and 95% confidence interval [CI]); *Intensive Care Units*



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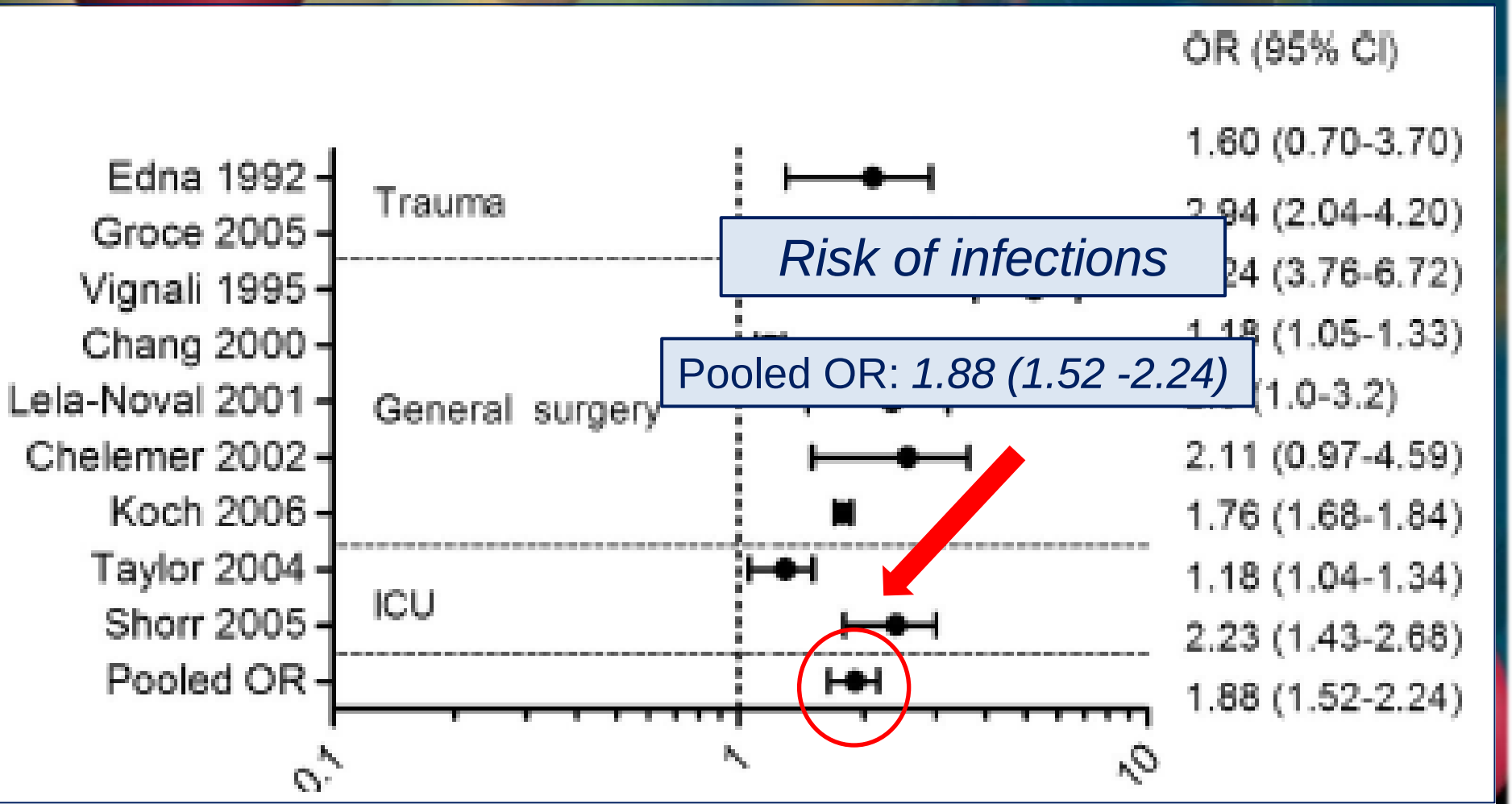
Efficacy of Red Cell Transfusion in the Critically Ill

Association between blood transfusion and the **risk of infections**
(Odds ration [OR] and 95% confidence interval [CI]); *Intensive Care Units*

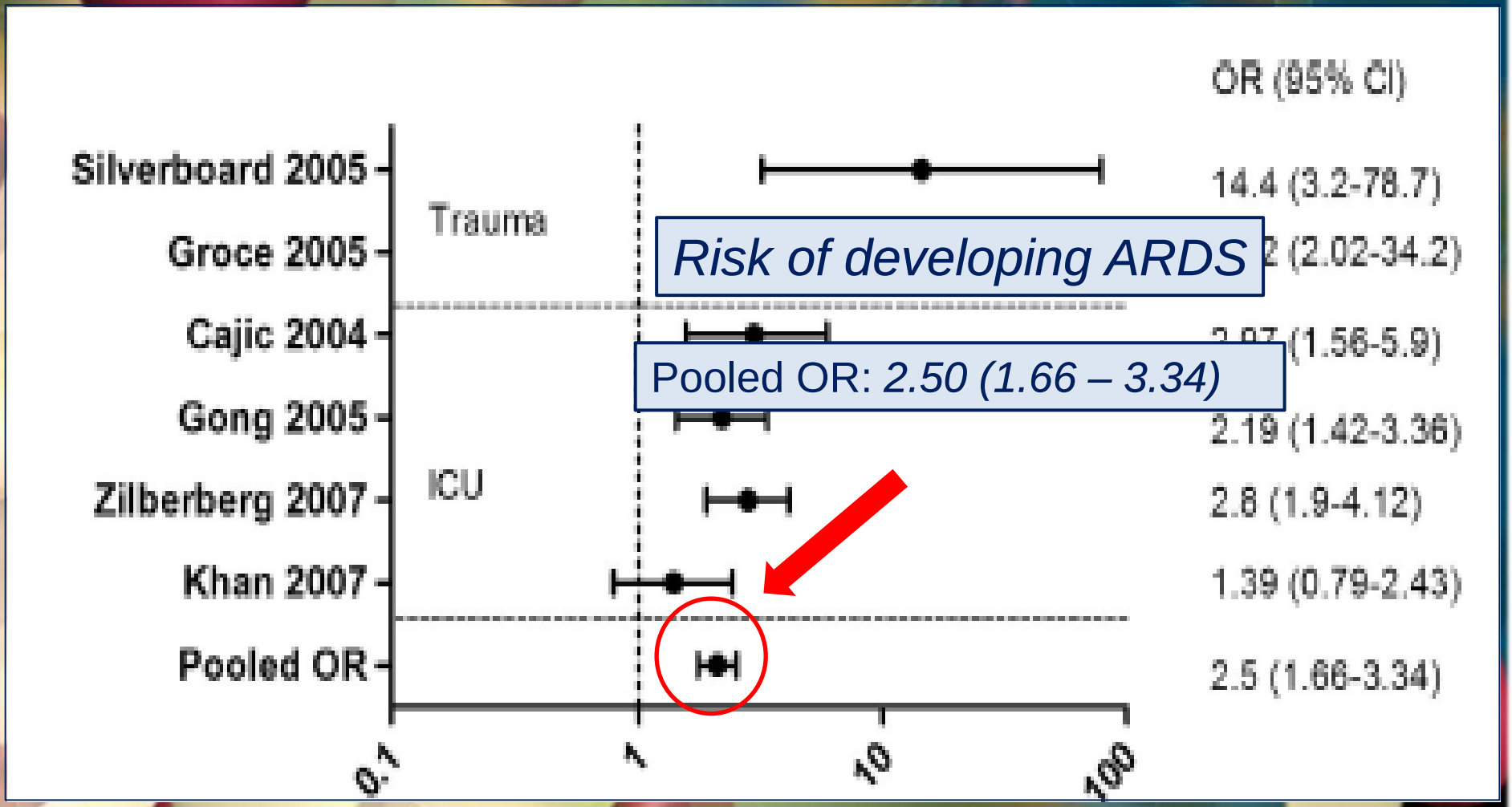


Slide acknowledgement Prof A Shander

Marik PE.et.al. Crit Care Med. 2008;36(9):2667-74

Efficacy of Red Cell Transfusion in the Critically Ill

Association between blood transfusion and the **risk of developing ARDS** (Odds ratio [OR] and 95% confidence interval [CI]); *Intensive Care Units*



Slide acknowledgement Prof A Shander

Marik PE.et.al. Crit Care Med. 2008;36(9):2667-74

Benefits and risks of red blood cell transfusion in pediatric patients undergoing cardiac surgery.

Guzzetta NA

Paediat Anaesth 2011 May;21(5):504-11

"However, a growing number of prospective randomized clinical trials are finding an association between RBC transfusion and an increased risk of morbidity and mortality even with the use of leuko-reduced blood.

Thus, it is becoming increasingly important that the decision to transfuse RBCs be made with a thorough understanding of the benefit-to-risk ratio."

Health Care–Associated Infection After Red Blood Cell Transfusion: A Systematic Review and Meta-analysis

Jeffrey M. Rohde, MD[1]; Derek E. Dimcheff, MD, PhD[1]; Neil Blumberg, MD[2]; Sanjay Saint, MD, MPH[1,3,4,5]; Kenneth M. Langa, MD, PhD[1,3,4,5]; Latoya Kuhn, MPH[3,4]; Andrew Hickner, MSI[1,3]; Mary A. M. Rogers, PhD[1,3,

JAMA. 2014;311(13):1317-1326. doi:10.1001/jama.2014.2726.

Conclusions and Relevance Among hospitalized patients, **a restrictive RBC transfusion strategy was associated with a reduced risk of health care–associated infection compared with a liberal transfusion strategy.**

Implementing restrictive strategies may have the potential to lower the incidence of health care–associated infection.

EXPERT REVIEWS

Transfusion immunomodulation from

Accumulated evidence demonstrates that allogeneic blood transfusions have clinically significant effects on the recipient's immune system.

Refaai & Blumberg; Exp Trans Rev

Majed A Refa
& Neil Blumb

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tory Medicine, Univers
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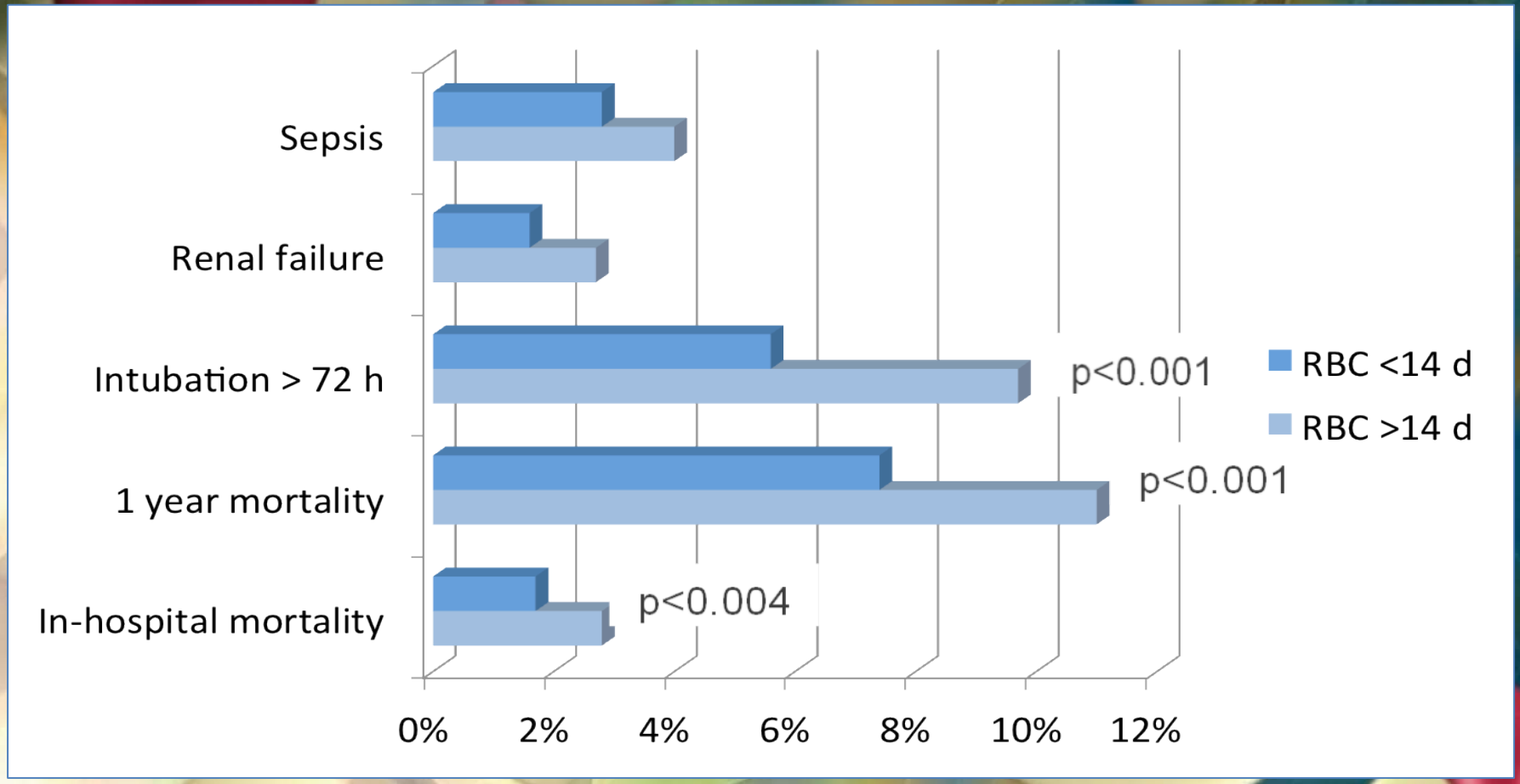
majed_refaai@urmc.rochester.edu*

s have clinically
mmunomodulation
ain causality) and
s of transfusion
homodulation is a
ukocytes. Soluble
storage are also

possible causes of post-transfusion complications. Some approaches can mitigate these effects. Most important is adopting more conservative transfusion practices. Leukoreduction (proven) and plasma depletion (proposed) are other methods to significantly reduce transfusion immunomodulation and its clinical sequela.

KEYWORDS: allogeneic transfusion • immunomodulation • leukoreduction • storage lesions • transfusion complication • transfusion

Clinical Outcomes are Impacted with Aged Blood
(n= 2,872 cardiac patients)



- Blood may be stored for up to 42 days in the US and parts of Europe

1. Koch CG, et al. N Engl J Med 2008; 358:1229–1239.

Noninfectious Risks of Transfusion

	ESTIMATED RISK
Mistransfusion	1:14,000 to 19,000
ABO-incompatible transfusion	1:38,000
Death due to ABO incompatible transfusion	1:1.8 million
Acute haemolytic transfusion reaction	1:12,000
Delayed haemolytic transfusion reaction	1:2000 to 1:12000
Transfusion-related acute lung injury (TRALI)	1:20,000 to 1:47,000 (5-10% fatal)
Anaphylaxis	1:150,000
Graft-vs-host disease (platelets)	1:150,000 (US)
	1:1.1 million (Canada)
	1:1,600 (platelets)
Post-transfusion purpura	1:143,000 to 1:32,000
Transfusion-associated circulatory overload (TACO)	1:708 to 3,200

THE LANCET

Preoperative anaemia and postoperative outcomes in non-cardiac surgery: a retrospective cohort study

Khaled M Musallam, Hani M Tamim, Toby Richards, Donat R Spahn, Frits R Rosendaal, Aida Habbal, Mohammad Khreiss, Fadi S Dahdaleh, Kaivan Khavandi , Pierre M Sfeir, Assaad Soweid, Jamal J Hoballah, Ali T Taher, Faek R Jamali

Khalid MUSALLAM,et al

Mussallam et al: www.thelancet.com Published online October 6, 2011

Slide acknowledgements to Toby Richards

THE LANCET

Articles

Khalid MUSALLAM, et al

Preoperative anaemia and postoperative outcomes in non-cardiac surgery: a retrospective cohort study

US Veterans Database (NSQIP) (n=227,425)

Anaemia (n=69,229; 30.4%)

30 day mortality

30 day composite morbidities (9 defined areas)

Preoperative and perioperative risk factors

Multivariate regression analysis

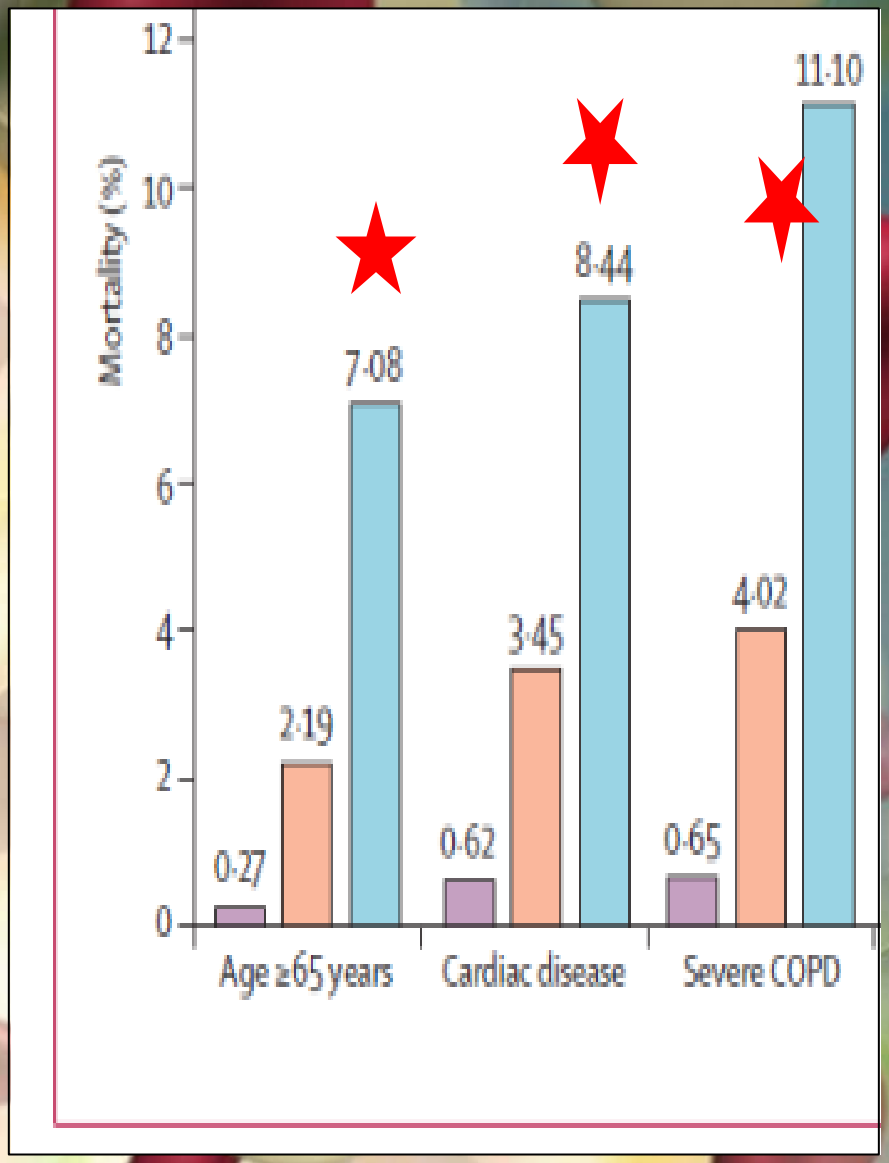
(9 defined subgroups)

(56 cofactors)

Slide acknowledgement to Dr Toby Richards

Mussallam et al: 30-day mortality

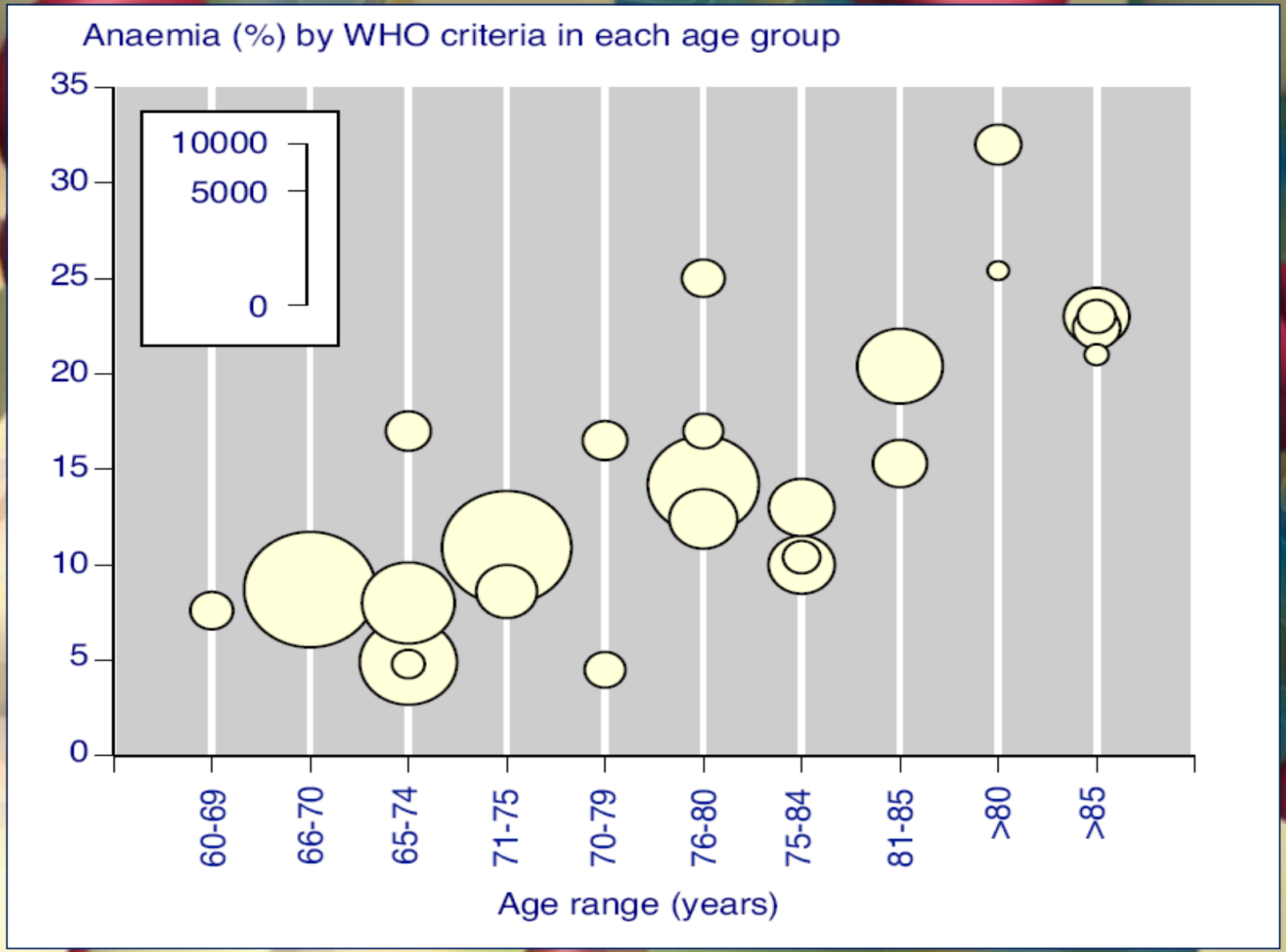
by *anaemia* and *risk factor status*



MUSSALLAM, K et al	
Mortality after surgery	
Impact of anaemia and comorbitities	
Condition	*(%) Mortality*
Baseline	*0.27*
Age ≥ 65 yo	*2.19*
Age ≥ 65 yo plus aneamia	*7.08*
Baseline	*0.62*
Cardiac disease	*3.45*
Cardiac disease plus anaemia	*8.44*
Baseline	*0.65*
COPD	*4.02*
COPD plus anaemia	*11.1*

Mussallam et al: www.thelancet.com Oct 6, 2011

Anaemia prevalence by age range



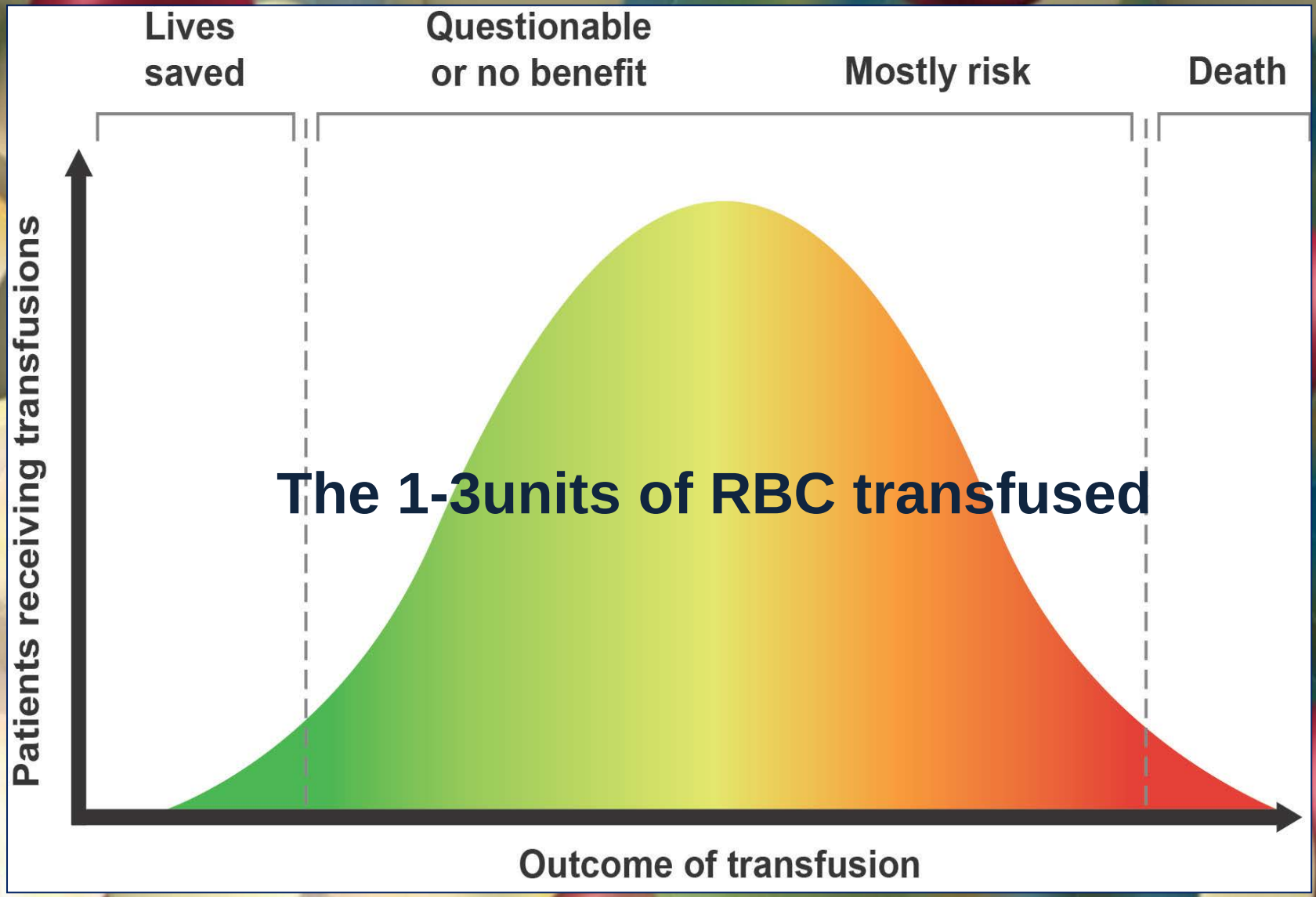
Gaskell et al. BMC Geriatrics 2008, 8:1

Anemia Is Often "Accepted" As A Normal Part Of Doing Business

- **We have a long tradition of accepting anemia as a relatively harmless problem that can be corrected easily with transfusion**
- **For the medical community transfusion as treatment for anemia remains a default position**
- **New paradigm - Anemia is an independent risk of morbidity and mortality regardless of the level of hemoglobin**

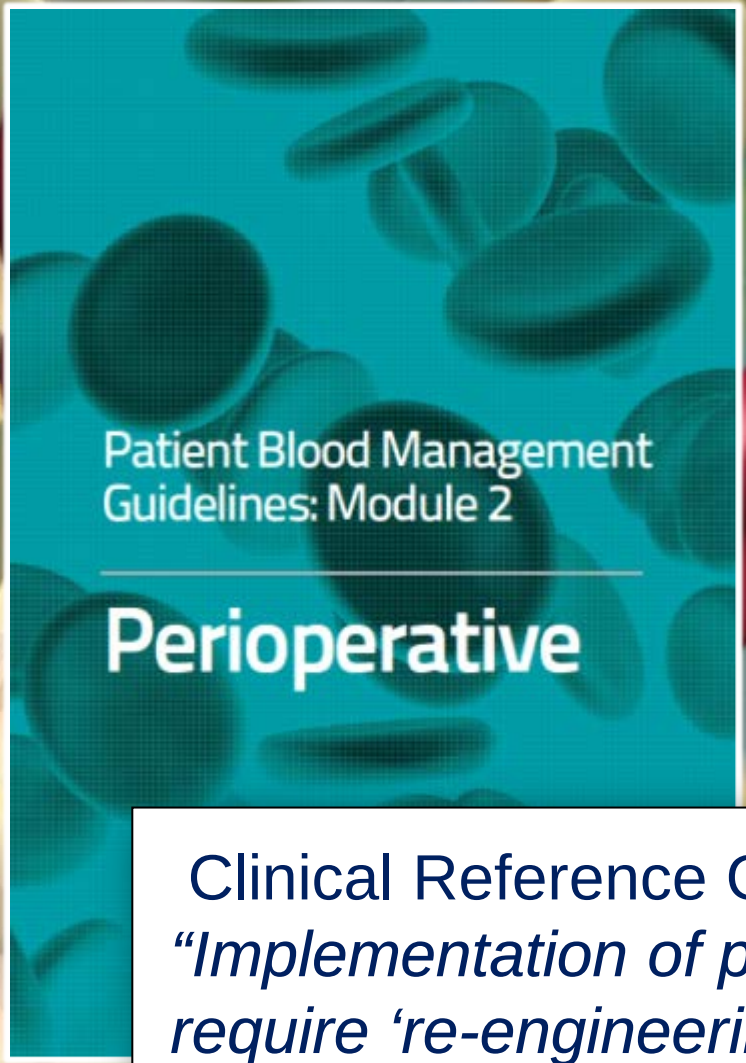
Isbister and Shander, TMR 2012

Blood Tx: Who gains? Who is at risk



Goodnough LT, Shander A. A&A 2012


What changes to implement?
Evidence and good practice!



National Blood Authority
PBM Clinical Guidelines
Module 2: ***Perioperative***

NHMRC

Clinical Reference Group

"Implementation of patient blood management will require 're-engineering' of the way major surgical services deliver perioperative care."

NBA/NHMRC Guidelines systematic review found:

'Implementation of PBM Programs is associated with a reduction in transfusion requirements during cardiac and non-cardiac surgery'

Patient blood management (PBM) program		
Recommendations - Perioperative PBM program		
R1	**C**	Health-care services should establish a multidisciplinary, multimodal perioperative PBM program (Grade C). This should include preoperative optimisation of red cell mass and coagulation status, meticulous attention to surgical haemostasis and minimisation of perioperative blood loss.

Anaemia and haemostasis: Perioperative Guidelines

- **Preoperative anaemia assessment**
- **Evaluate surgical patients early**
- **Optimise patient's haemoglobin and iron stores**
- **Administer preoperative iron therapy**
- **Manage clopidogrel, aspirin, NSAID and warfarin as per guidelines**

Blood Conservation Strategies: Perioperative Guidelines

Recommend:

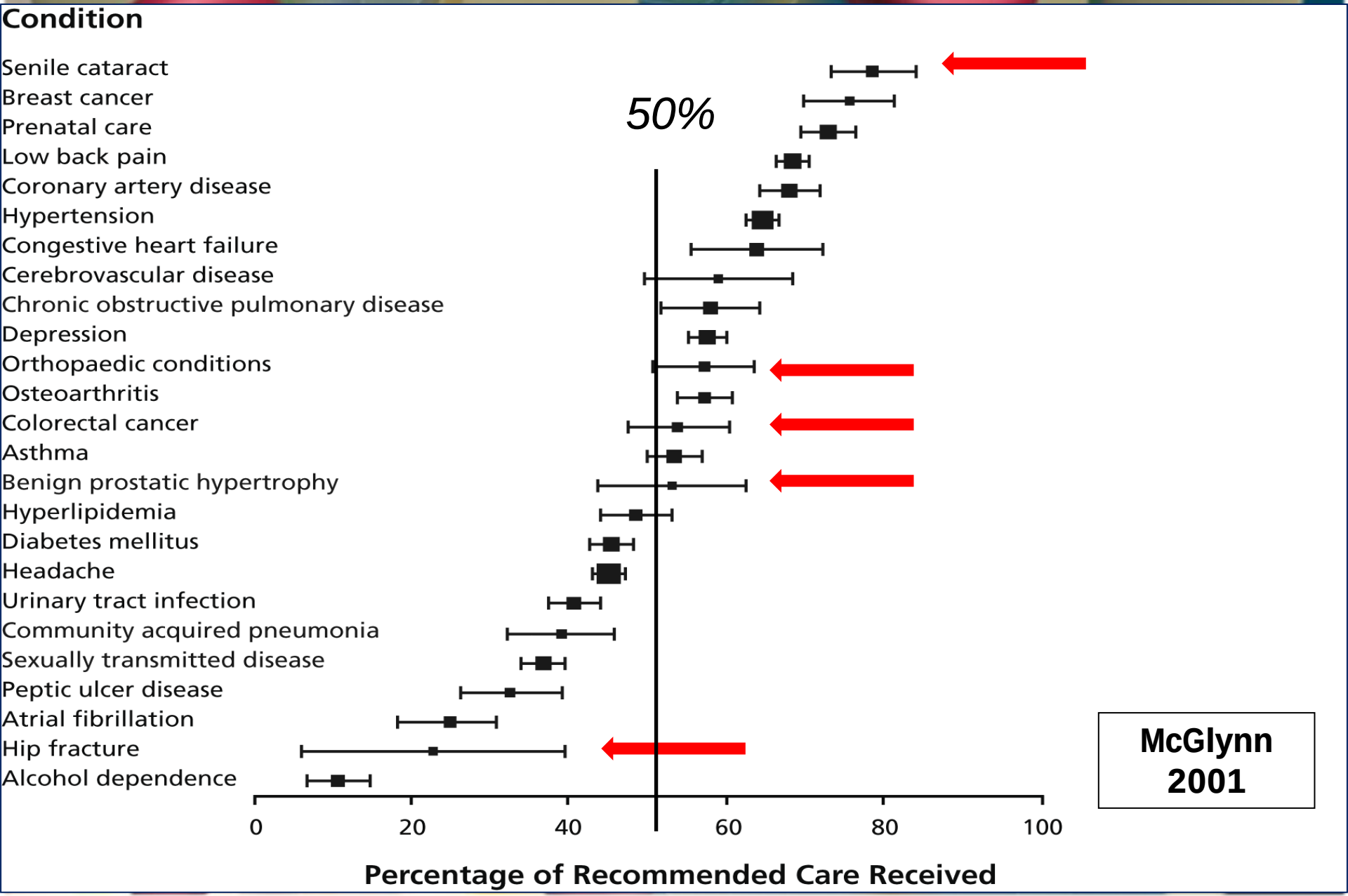
- Prevention of hypothermia
- Appropriate patient positioning (during & after)
- Intraoperative cell salvage (develop local procedural guideline)
- Medications (tranexamic acid, ε-aminocaproic acid, desmopressin)

Consider:

- Deliberate induced hypotension - prostatectomy, joint replacement
- Acute normovolemic haemodilution if substantial blood loss is anticipated
- Use of thomboelastography
- Postoperative cell salvage (cardiac surgery, total knees)

Managing Disease

How well do we treat patients?



Lessons from history – slow to learn!

The Four Humours!

Blood, phlegm, yellow bile and black bile

Blood carried the vital force of the body and was the seat of the soul

Blood letting *was a procedure performed to alleviate the ills of mankind!*

A 3000 year practice

Dr Benjamin Rush treated **George Washington** for laryngitis by generous blood letting

Washington died 24 hours later…..

History of Transfusion 1

- 1616 - **William Harvey** – circulation
- 17thC - **Christopher Wren** – infusion techniques
- 1666 - **Richard Lower** – dog to dog transfusion
- 1667 - **Richard Lower** – lamb's blood to human

  - to treat a mildly melancholic insane man
- **Jean Baptiste Denys** – calf blood to human

  - patient died - transfusion was banned

History of Transfusion 2

- **NUCK** – 1714, **CANTWELL** 1749

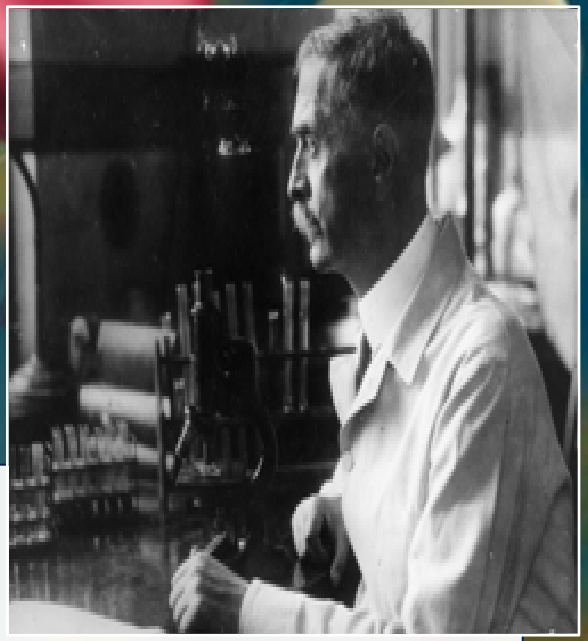
  – proposed value of transfusion in haemorrhage

- James **BLUNDELL** – 1818

  - blood transfusion postpartal haemorrhage

- **LANDOIS** – 1875 monograph – 347 cases

History of Transfusion 3



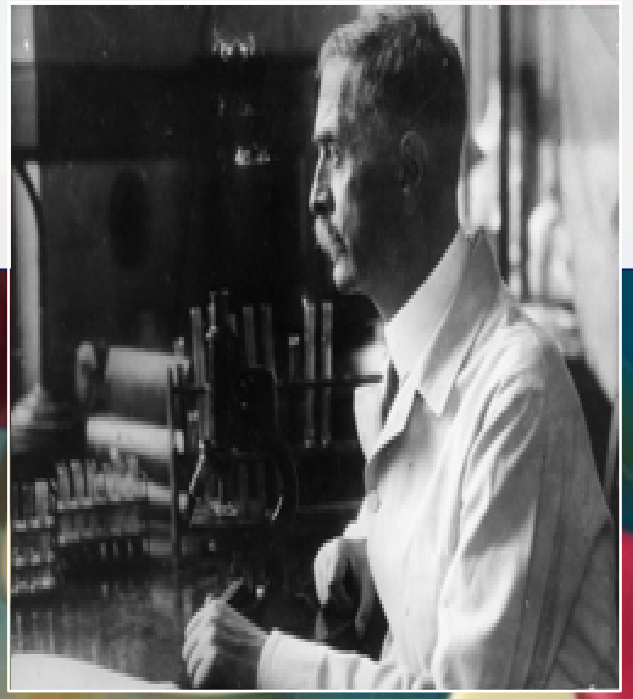
- *1900* - Karl **LANDSTEINER**
  - blood groups
- *1907* - Ruben **OTTENBURG**
  - cross-matched Tx – Mt Sinai -NY
- *1920's* – **LEWISHOHN**
  - citrate - storage

"The number of transfusions given is surprisingly large, and it may well be that the use of this technique has been taken too far."

Karl Landsteiner

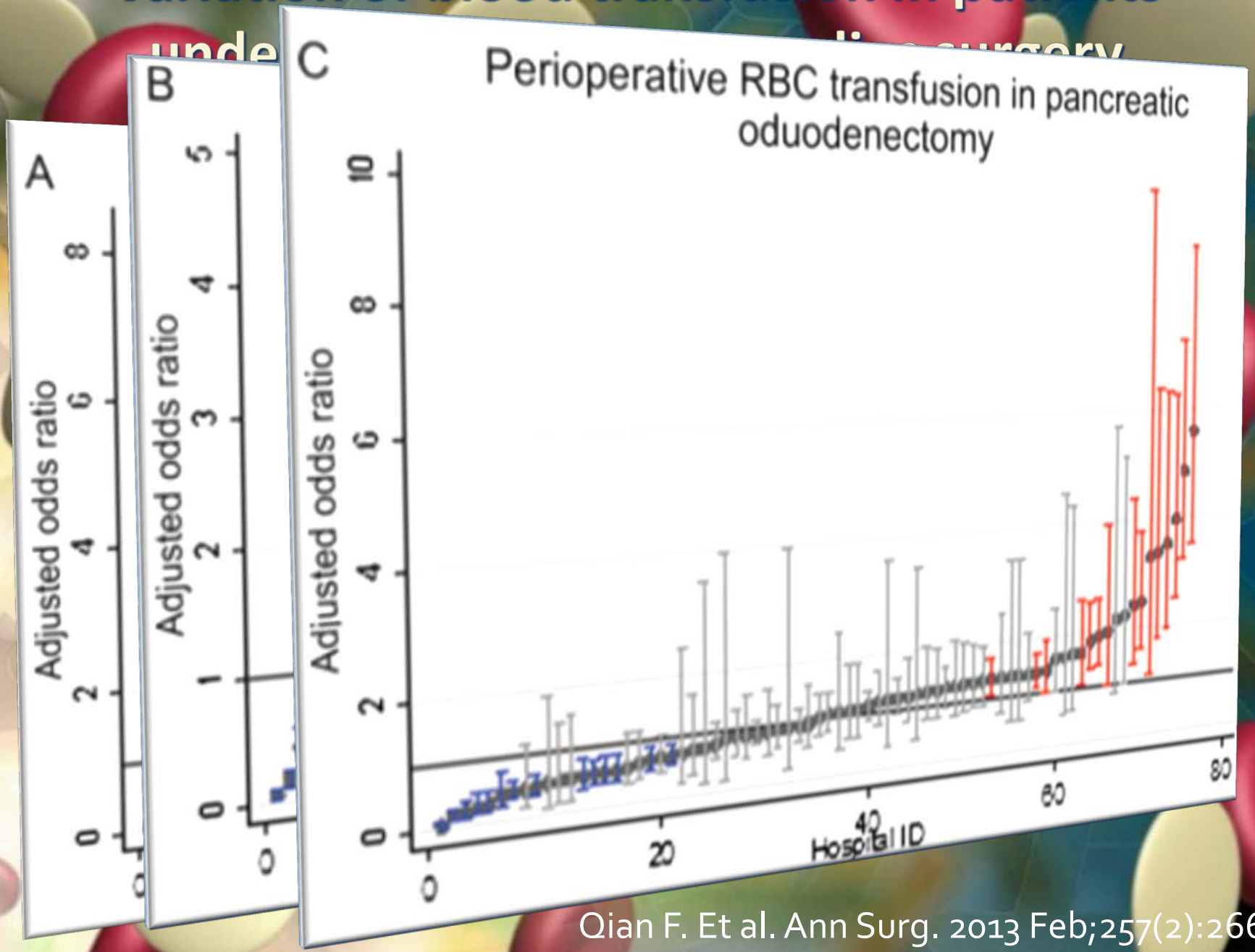
Nobel lecture

1930



History of Transfusion 4

Variation of blood transfusion in patients



Qian F. Et al. Ann Surg. 2013 Feb;257(2):266-78

SURGICAL CULTURE DETERMINES TRANSFUSION BEHAVIOR/BELIEF

Effect of Hospital Culture on Blood Transfusion in Cardiac Procedures

Ruyun Jin, MD, MCR, Edy S. Zelinka, CCP, Julie McDonald, BSN, Thomas Byrnes, BS, Gary L. Grunkemeier, PhD, and James Brevig, MD on behalf of Providence Health & Services Cardiovascular Disease Study Group

Medical Data Research Center, Providence Health & Services, Portland, Oregon; Providence Regional Medical Center Everett; Providence Physician Group, Providence Health & Services, Everett, Washington

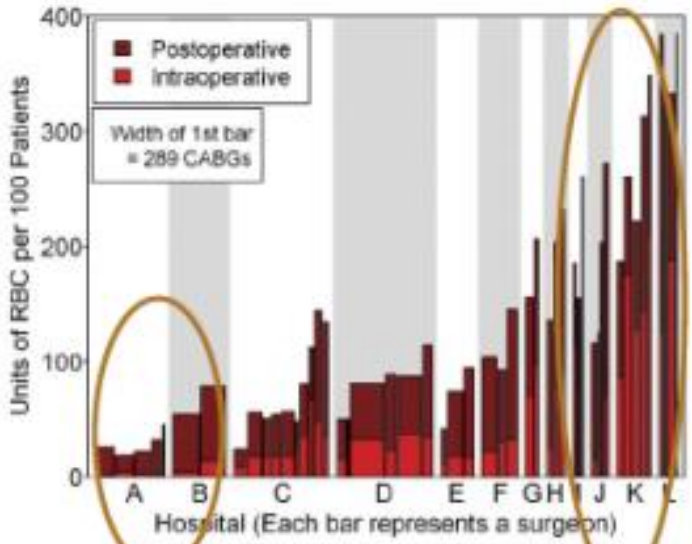


Fig 5. Timing of red blood cells (RBC) transfusion by surgeon. Surgeons are grouped by hospital, indicated by the alternating vertical shaded panels. The widths of the bars represent surgeon volumes. (CABG = coronary artery bypass grafting.)

(Ann Thorac Surg 2012;xx:xxx)

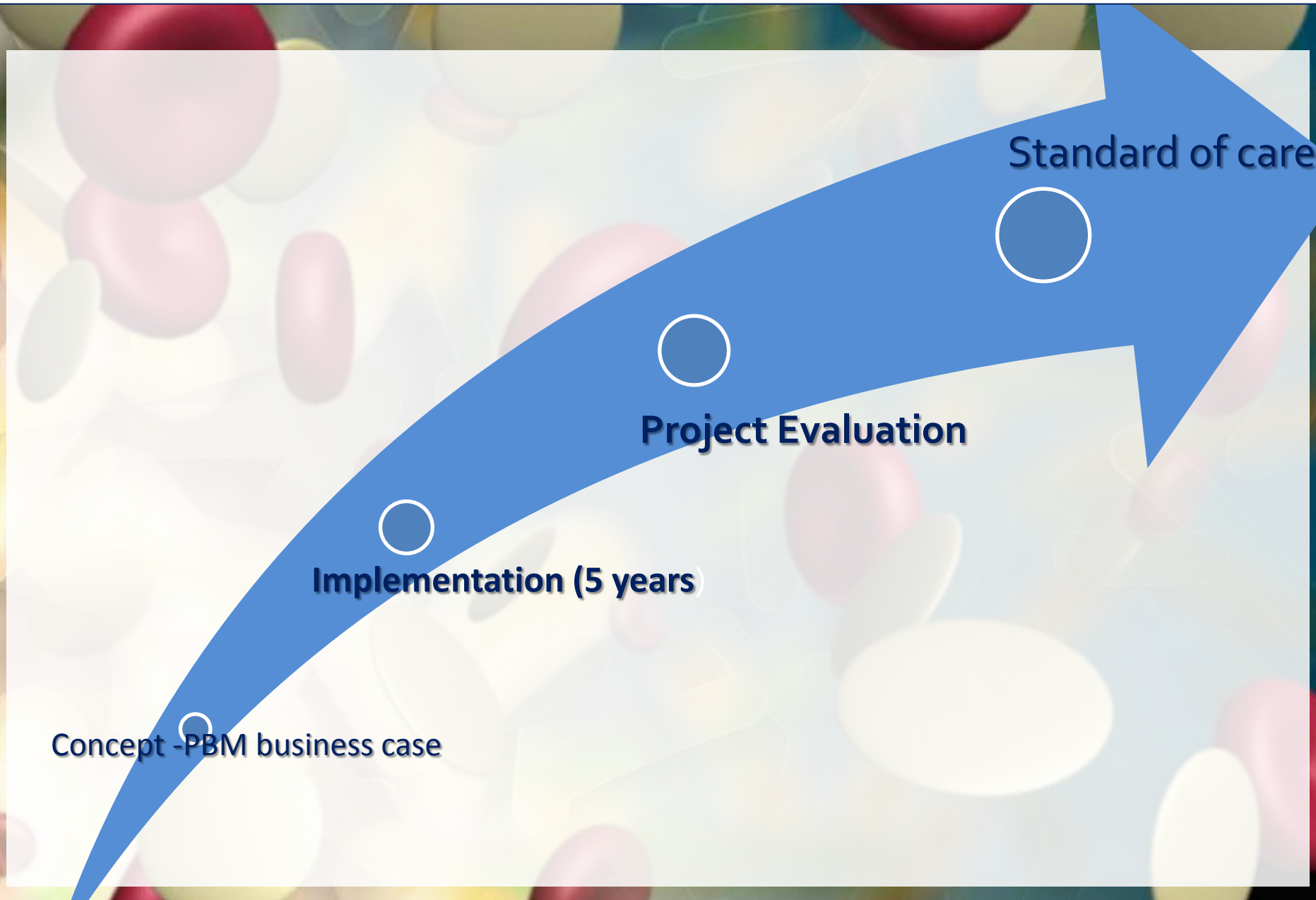
What is the "culture of Tx?
Who has better outcomes?

SIR KEVIN ROBINSON – adult education

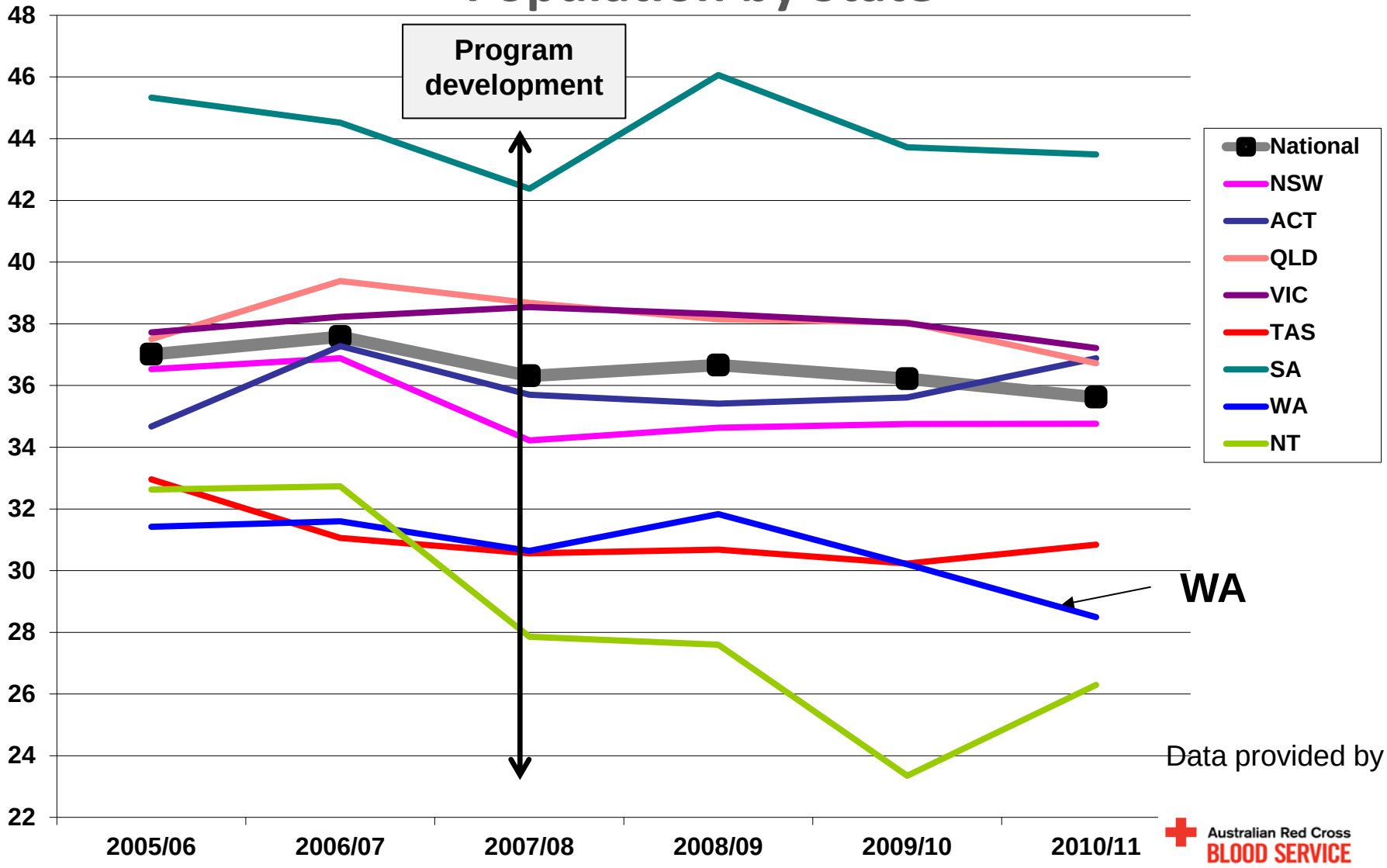
- *"Innovation is hard because it means doing something that people don't find very easy, for the most part.*
- *It means challenging what we take for granted – things that we think are obvious.*
- *Th* *e tyr*
- *Th* *oth*

The Challenge:
Changing patient, clinician and system behaviour:
Everything has to change!

WA Patient Blood Management Project



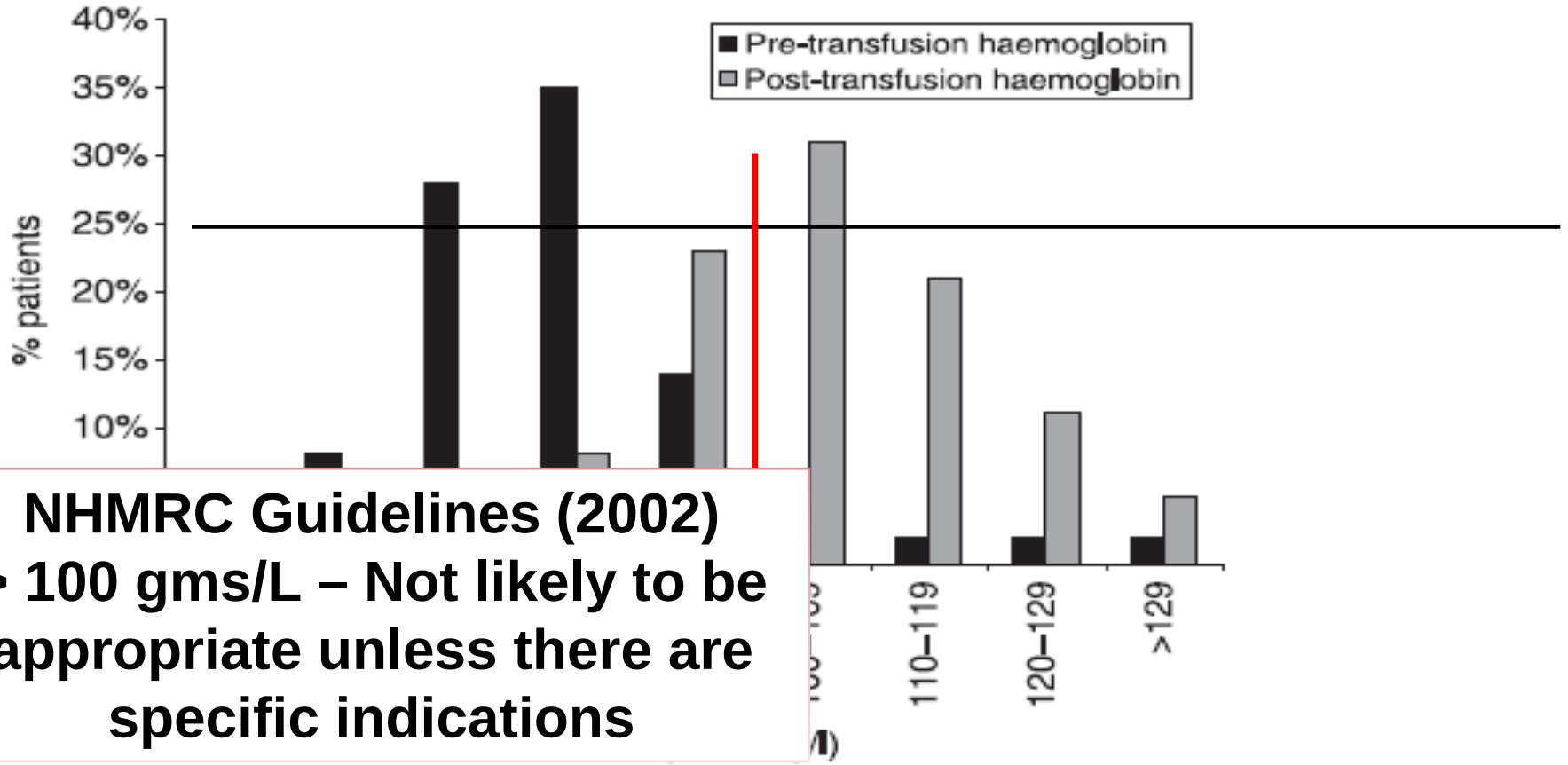
Australian Red Cell Supply per 1,000 Population by State



Data provided by

Australian Red Cross BLOOD SERVICE

 Vox Sanguinis (2006) 90, 316–324



NHMRC Guidelines (2002)
> 100 gms/L – Not likely to be appropriate unless there are specific indications

Fig. 5 Pre- and post-transfusion haemoglobin levels throughout the hospital.

Comprehensive PBM programs r

- reduction up to 68%

- 16-28% reduction

- reduction up 43%

- reduction of composite morbidity up to 41%, reduction of infection rate up to 79%

- 10-24% reduction

WA Patient Blood Management Project

How..?

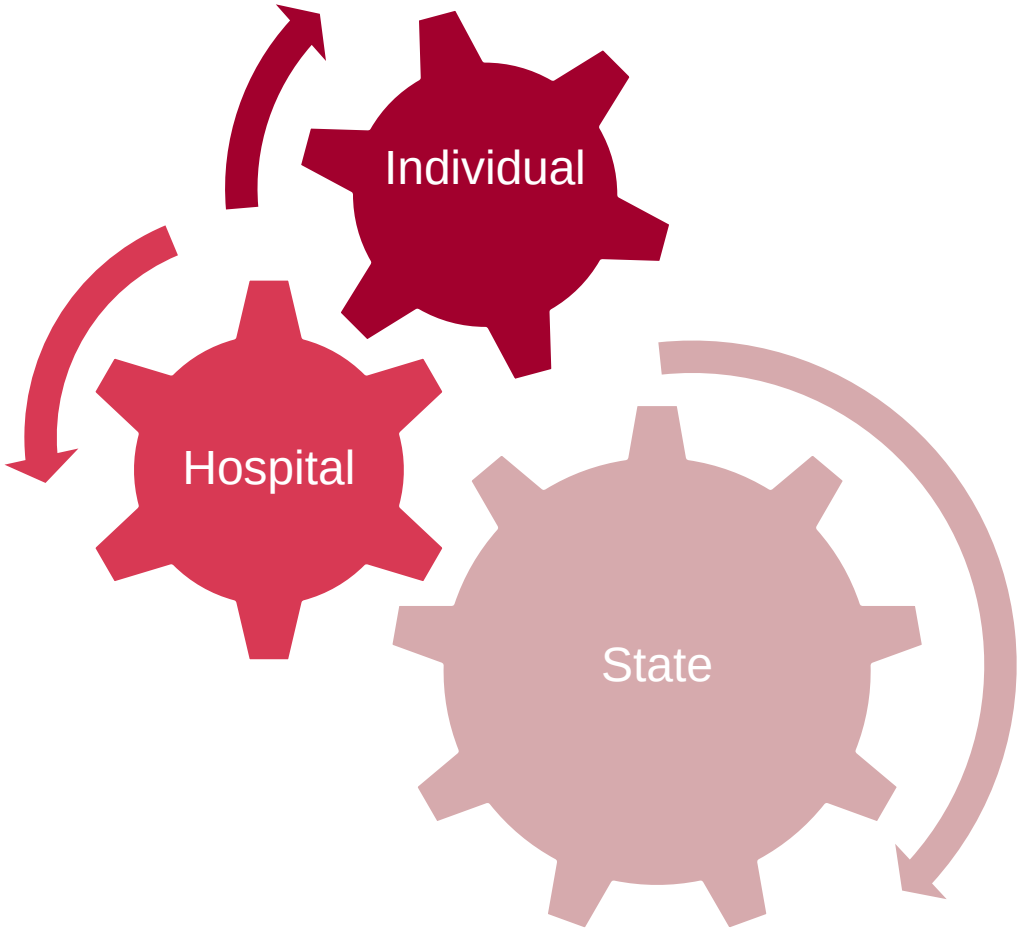
- **Statewide approach** to patient blood management
- Working from **change management** principles
- Using **data** as driver for change
- Using system approach within a **quality framework**
- Addressing **haemovigilance**
- Using **international expertise** to lead
- Building a **local team** for **long term success**

How the program addresses change

- Early emphasis on data development
- Data being developed for presentation to clinicians
- Data being developed for KPI's reporting to Department of Health
- International faculty visiting regularly
- Anaemia workshop at end of April
- Appointment of PBM nurses!

Plan and create short term wins

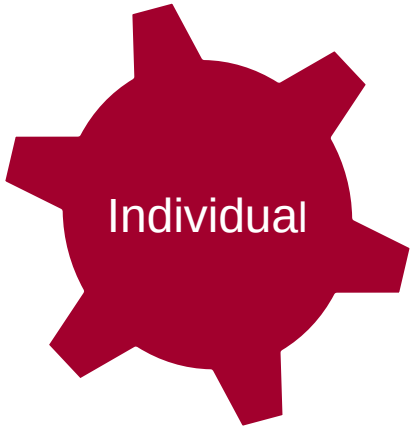
Addressing the challenges



Patient Blood Management program

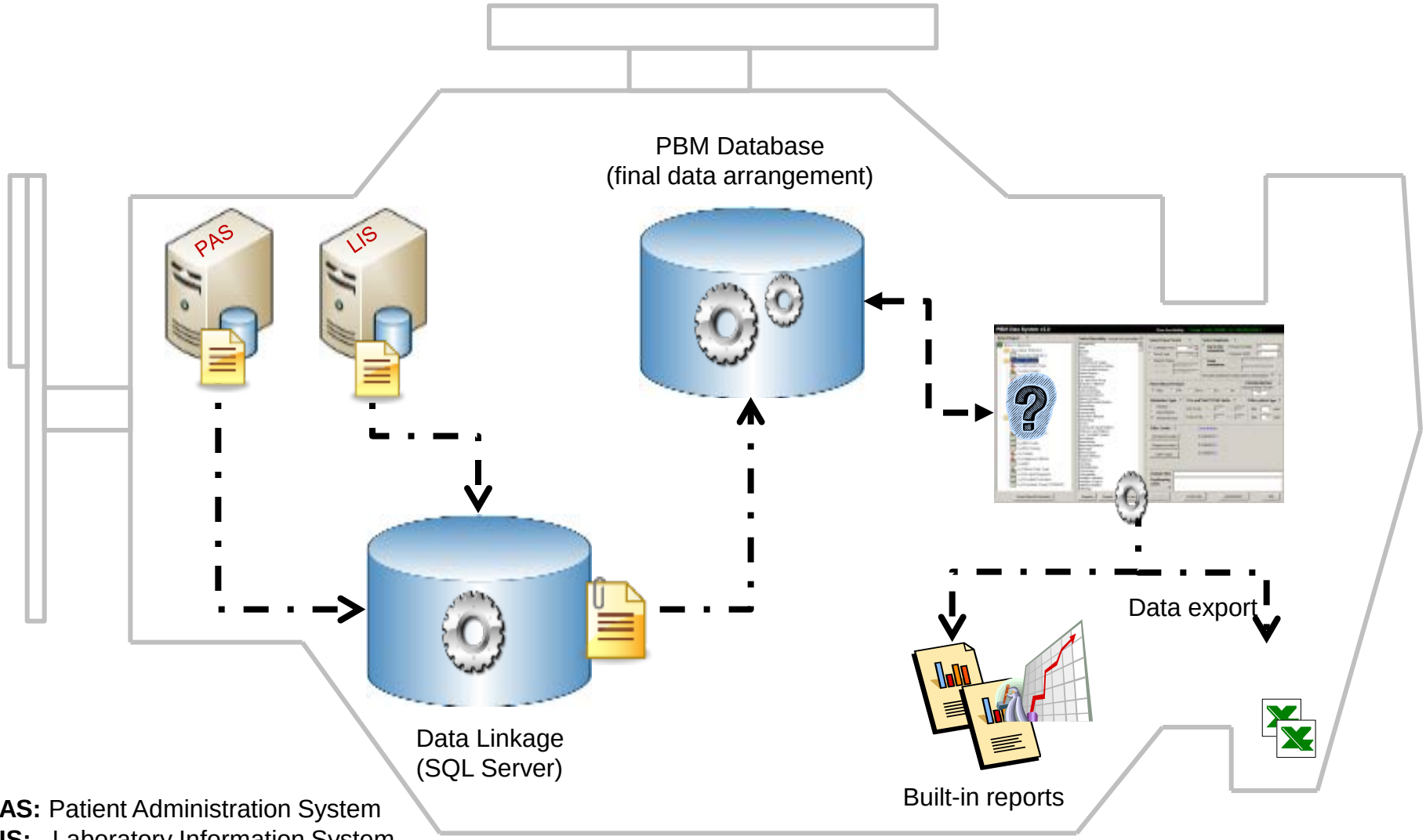
Approaches to individual practice

1. Education and training
   - Medical: Undergraduate, interns and RMOs, **senior registrar and consultant levels**
   - Nursing and Allied Health (laboratory staff and pharmacists)
   - Transfusion practice and PBM
   - Didactic and procedural



2. Data and feedback
3. Benchmarking transfusion practice (and outcomes)
4. Literature updates

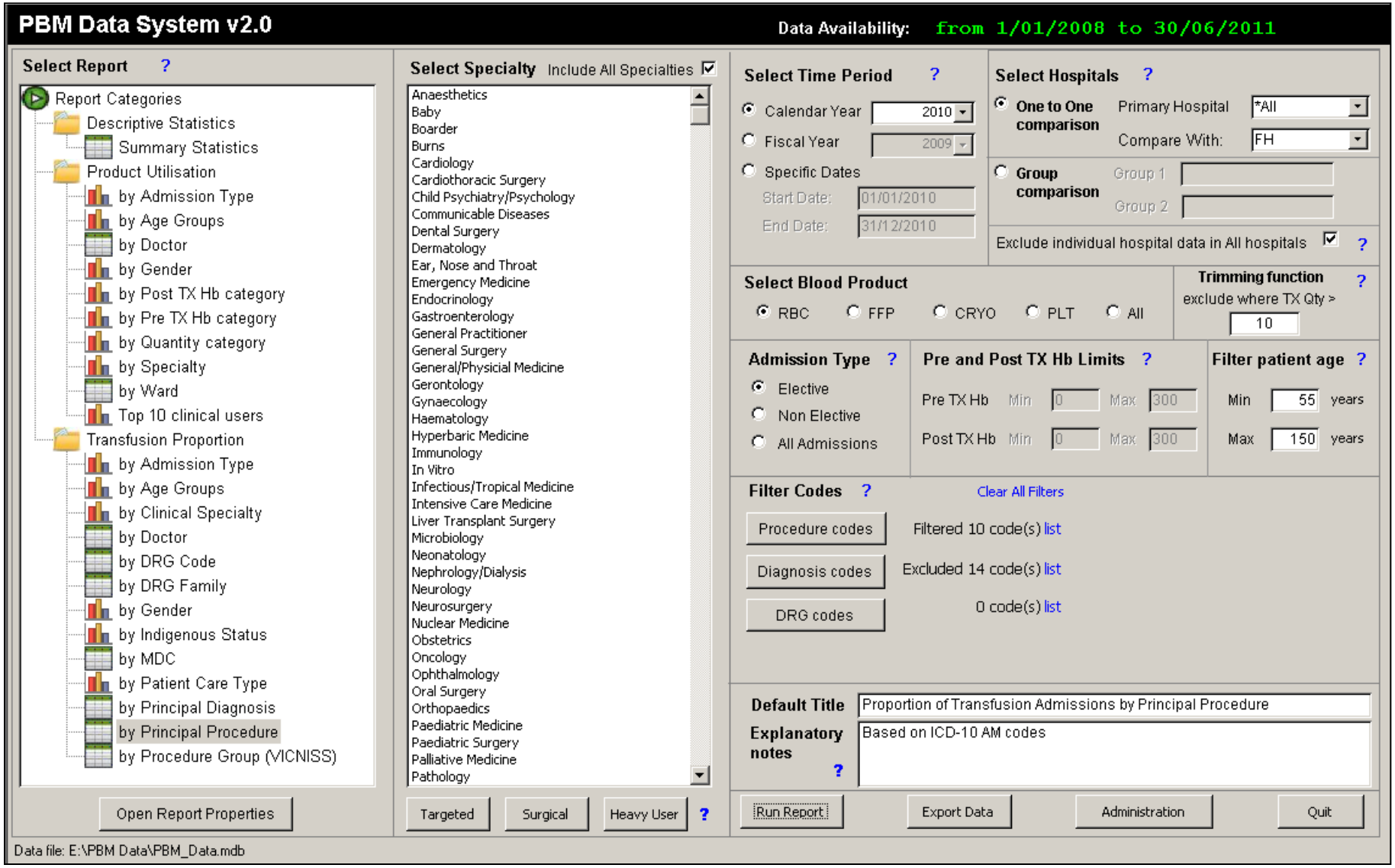
PBM Data System V2.0



PAS: Patient Administration System
LIS: Laboratory Information System

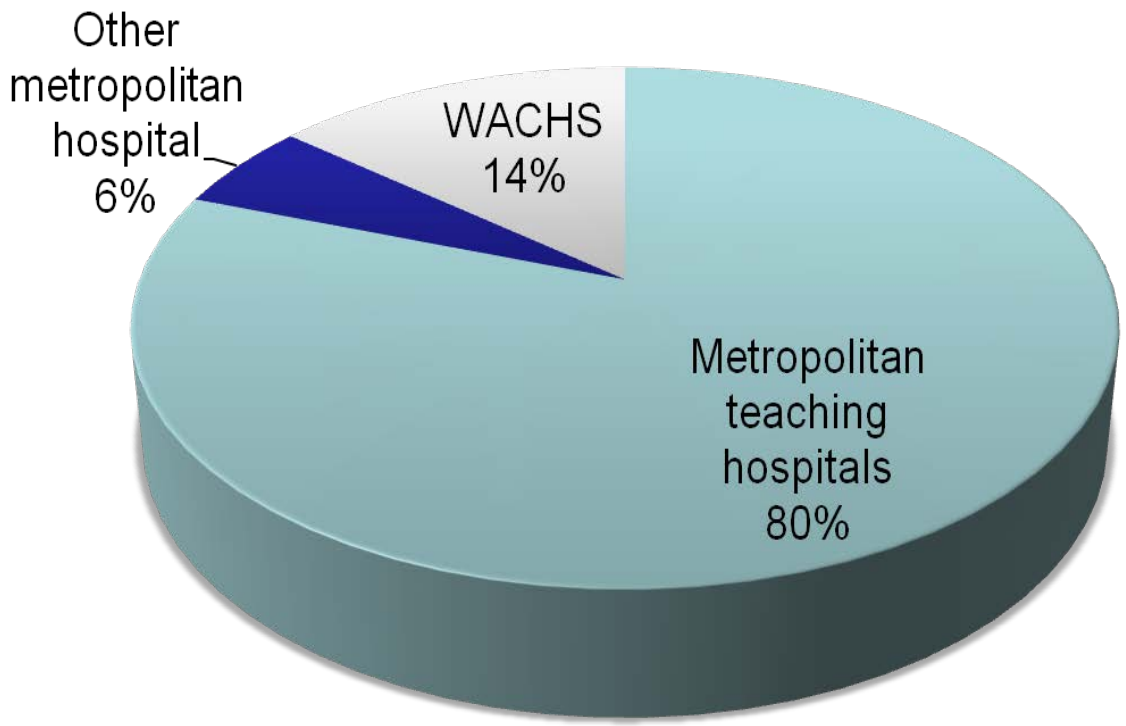
Developed by Aqif Mukhtar

A data system for understanding blood use

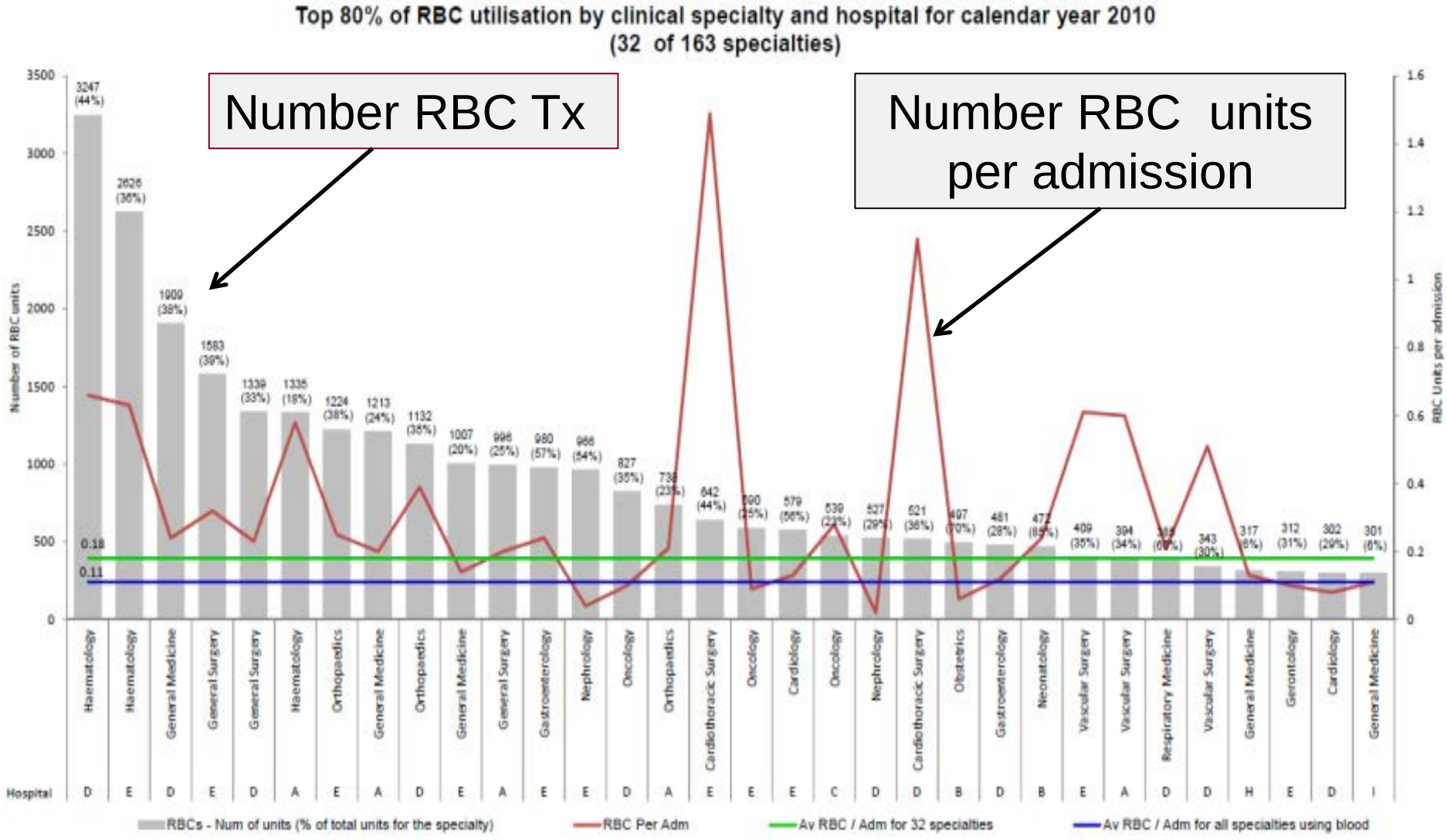


Where does blood go in WA Health?

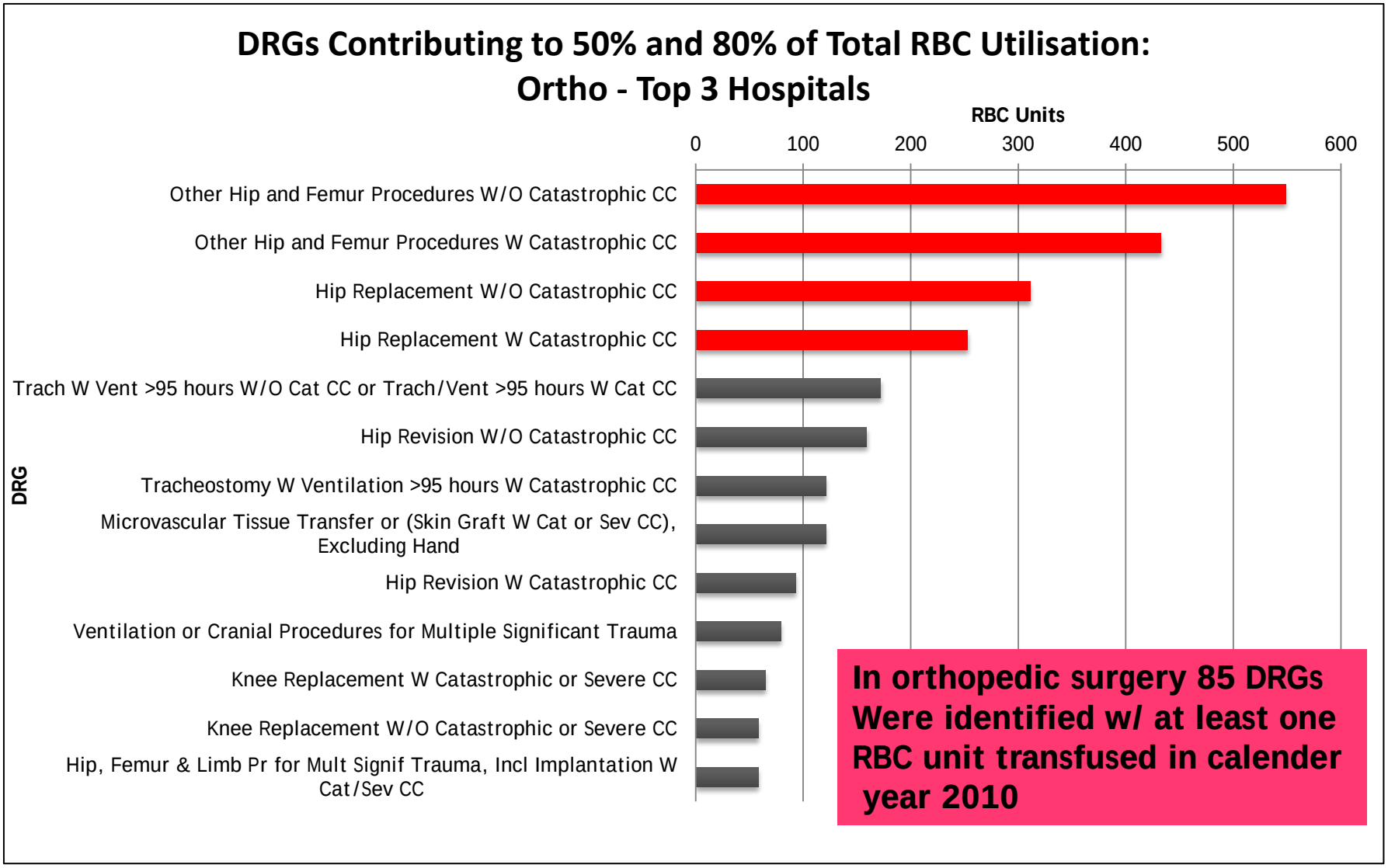
- 2010-11 financial year
- 55,106 RBC units transfused



Comparing RBC use across specialty and hospital



Comparing RBC use across procedures



Using data as a driver for change

Blood Products Usage by Doctors

Between Calendar Year 2010

Based on discharging doctor.

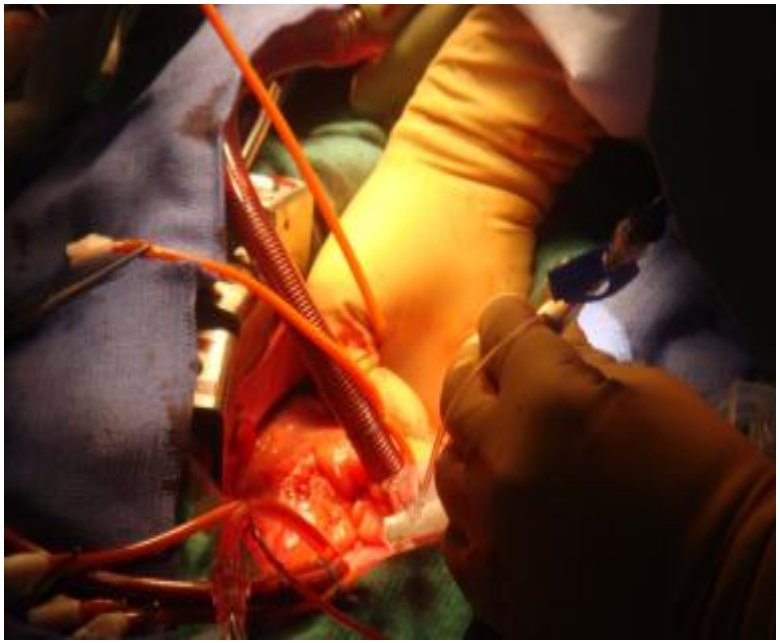
FH

Doctor ID	TXs	% Total	Units TX	Avg Units
500094	258	7.51%	485	1.88
500994	257	7.48%	437	1.7
503347	166	4.83%	268	1.61
508509	137	3.99%	214	1.56
510461	108	3.14%	162	1.5
503796	95	2.76%	243	2.56
502775	92	2.68%	170	1.85
505018	91	2.65%	165	1.81
510133	84	2.44%	161	1.92
500969	78	2.27%	121	1.55
500973	76	2.21%	120	1.58
503876	76	2.21%	154	2.03
500079	73	2.12%	128	1.75
501010	71	2.07%	153	2.15
502905	70	2.04%	141	2.01
510518	67	1.95%	110	1.64
503376	59	1.72%	126	2.14
509257	57	1.66%	126	2.21
503364	57	1.66%	90	1.58
504911	54	1.57%	84	1.56
500676	52	1.51%	139	2.67
504199	49	1.43%	79	1.61
502666	48	1.40%	83	1.73
501024	45	1.31%	86	1.91
501001	44	1.28%	83	1.89
503441	44	1.28%	80	1.82
508834	41	1.19%	105	2.56
507752	41	1.19%	69	1.68

Education and training

PBM surgical workshop

haemostasis training program



Fremantle Hospital PBM Program

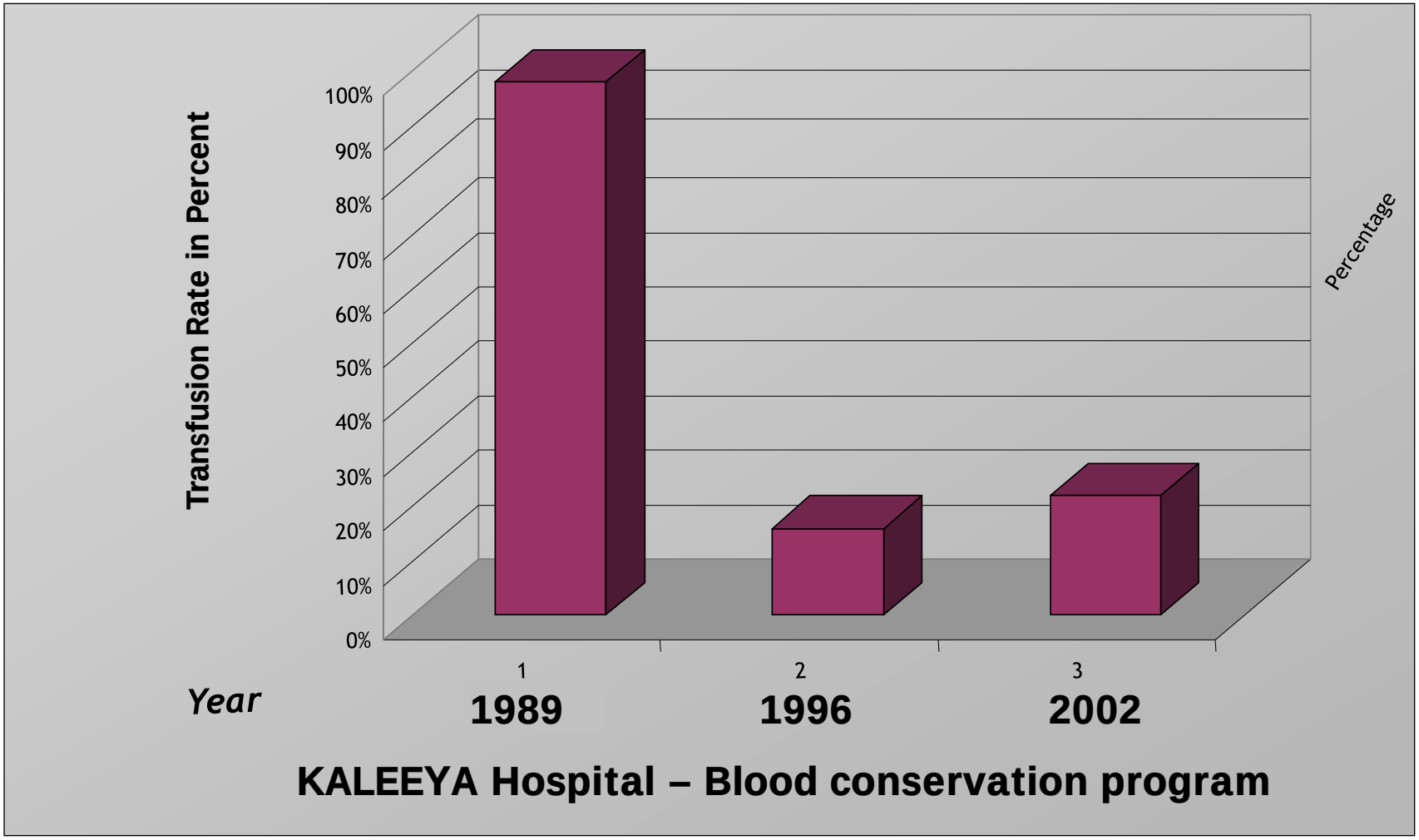
A model for the WA Health System

Focus is on:

- Reducing blood use
- Achieving improved patient outcomes
- Delivering cost savings

Kaleeya Hospital

Perioperative Transfusion Rate (%) in Total Hip Replacement (Primary & Revision)



1. Small draw blood collection tubes

Minimise blood loss in patients who are frequently bled…

Audit – more blood taken from ICU patients in 24 hours than healthy person makes in 24 hours!

Same size, less vacuum

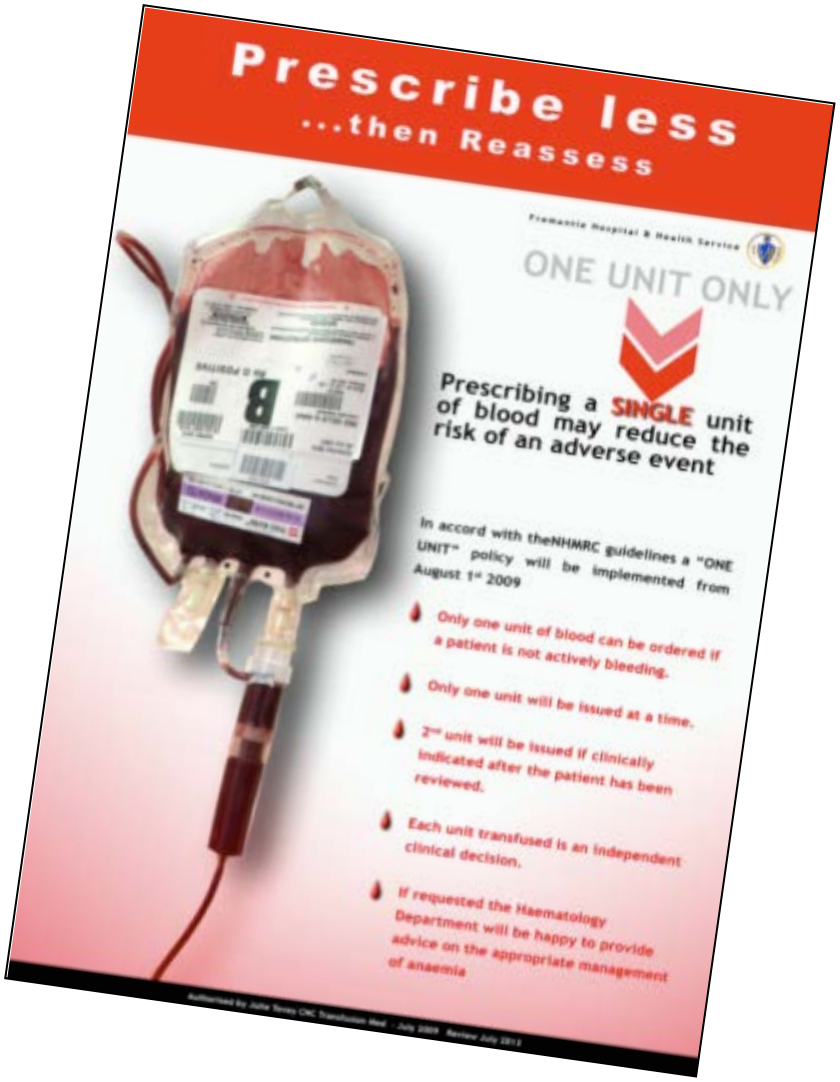
FH introduced for ICU and Haem /Onc wards

62 litres of patient blood saved in ICU alone

Table 1: Blood saved in ICU patients Fremantle Hospital (6 months)

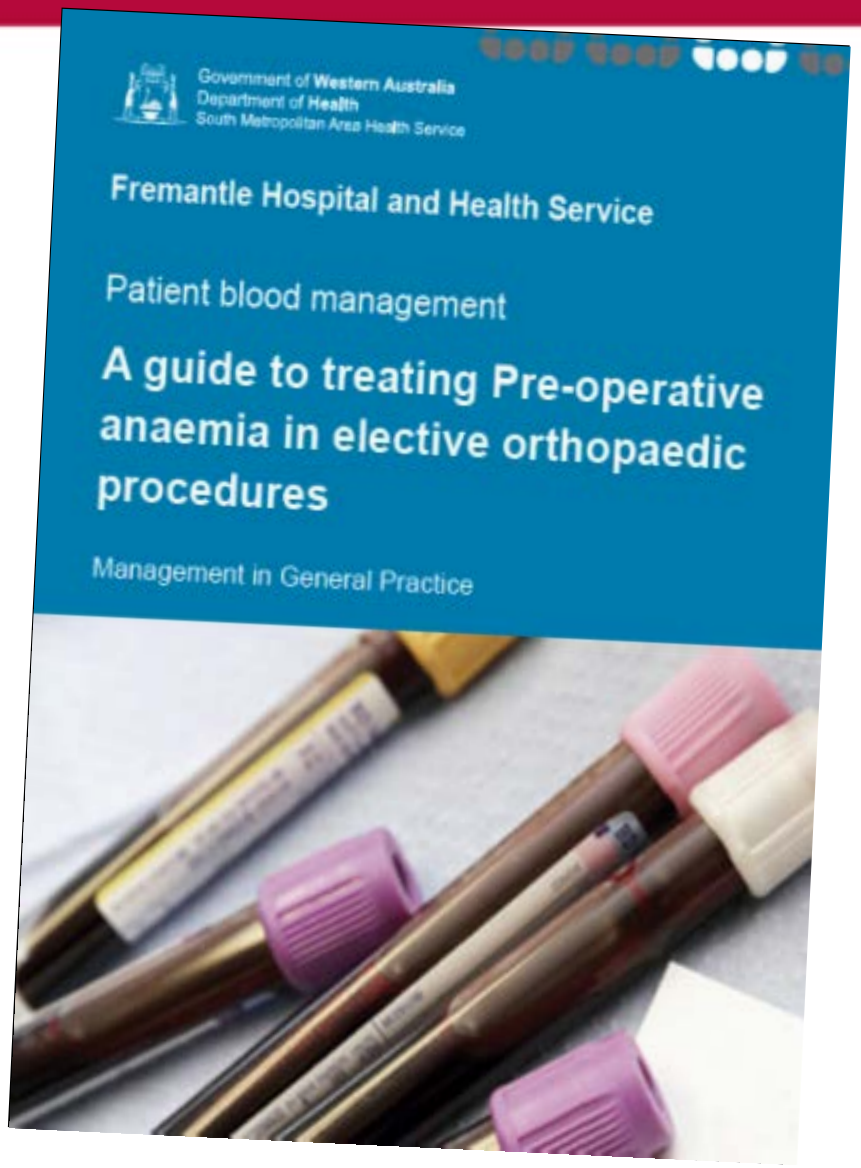
Test	Prev. Qty (ml)	New Qty (ml)	Savings (ml)	Tubes used	Blood saved (Litres)
Full Blood Picture (FBP)	4.0	3.0	1.0	9,566	9.6
Group and Antibody Screen	10.0	6.0	4.0	7,508	30.0
Coagulation (YCO)*	3.5	2.7	0.8	18,568	14.9
Biochemistry (YAU)*	5.0	2.5	2.5	2,994	7.5
Total					**62.0**

2. Single unit policy



3. Anaemia screening

- Pre and post-operatively
- Elective cardiothoracic and orthopaedics



4. IV iron

Government of Western Australia
Department of Health
Fremantle Hospital & Health Service

Intravenous (IV) iron infusions

Why iron given by a drip into a vein is sometimes needed...
This leaflet answers some common questions about IV iron infusions. It does not contain all available information and does not take the place of talking to your doctor about why IV iron has been recommended in your particular case.

What is an IV iron infusion?

"Intravenous" or "IV" means giving something directly into the blood stream of the body through a vein. A needle placed into a vein (usually in the back of the hand or arm) is attached to a drip that contains iron mixed with saline (a sterile salt water solution). This fluid is slowly "dripped" (infused) into the vein and mixes with the blood in your body.

Why is iron important?

Iron is essential for the body to make haemoglobin (Hb), a pigment that makes red blood cells red. When the amount of iron in the body gets too low, the haemoglobin level falls below normal. This is known as "iron deficiency anaemia".

Haemoglobin is very important as it carries oxygen from the lungs to the rest of the body. If your haemoglobin or iron levels are low this may make you feel tired and not able to carry out your normal routine.

Why might I need IV iron?

The most common way to treat iron deficiency anaemia is to take iron by mouth as a tablet or liquid. This approach works well for most people and is usually tried first.

IV iron might be needed if you are:

- Unable to tolerate iron taken by mouth
- Unable to absorb iron through the gut
- Unable to absorb enough iron due to the amount of blood that the body is loosing
- In need of a rapid increase in iron levels to avoid important complications or a blood transfusion

Risks & benefits of IV iron

Your doctor will explain the risks, benefits & available alternatives to IV iron in your particular case. The most significant risk of IV iron is a small chance of having an allergic reaction which can in rare cases be life threatening. IV iron is prescribed for iron deficiency anaemia when oral iron is not tolerated, effective or likely to work quickly enough & the benefits of IV iron outweigh the risks in your particular case.

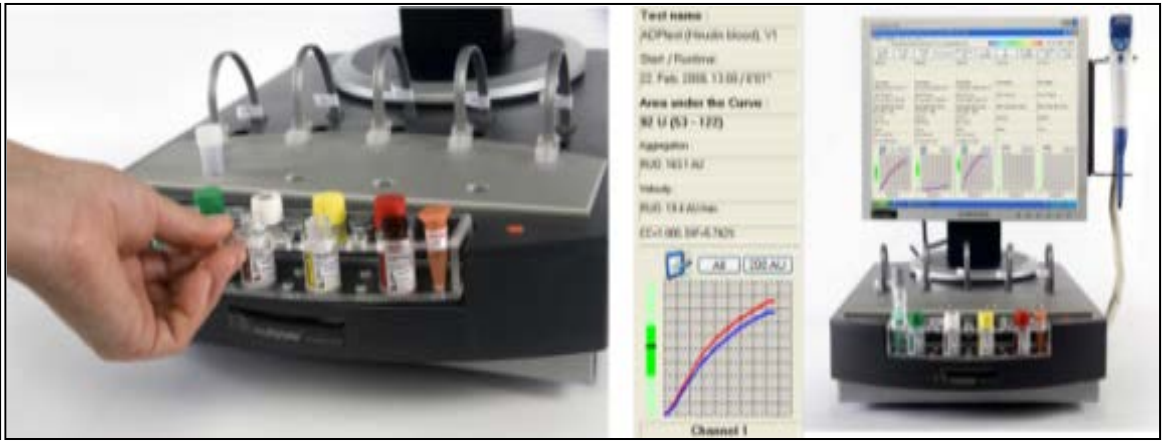
Alternatives to IV iron

- **ORAL IRON:** If you are able to tolerate and absorb iron taken by mouth this is the first strategy that should be tried (unless a more rapid increase in your Hb level is needed). If you get tummy upset with iron tablets, a lower dose of iron as syrup can be tried and increased slowly as tolerated or iron tablets can be taken 2 or 3 times per week instead of daily–discuss this with your doctor as it is important that the right amount of iron is given. Many iron tablets claim to be gentle on the stomach but don't have enough iron in them to treat anaemia.
- **IM IRON:** Injection of iron into muscle (IM) is not recommended as it is painful & can cause permanent skin scars/discolouration.
- **BLOOD TRANSFUSION:** Transfusion can be life saving when severe anaemia or bleeding is present. It carries greater risks than IV iron & should be avoided unless an immediate increase in Hb level is needed (when the benefits outweigh the risks).
- **DIET:** Once a person has already become low in iron and anaemic it is difficult to get enough iron back into the body even with a diet that is high in iron.

Fe

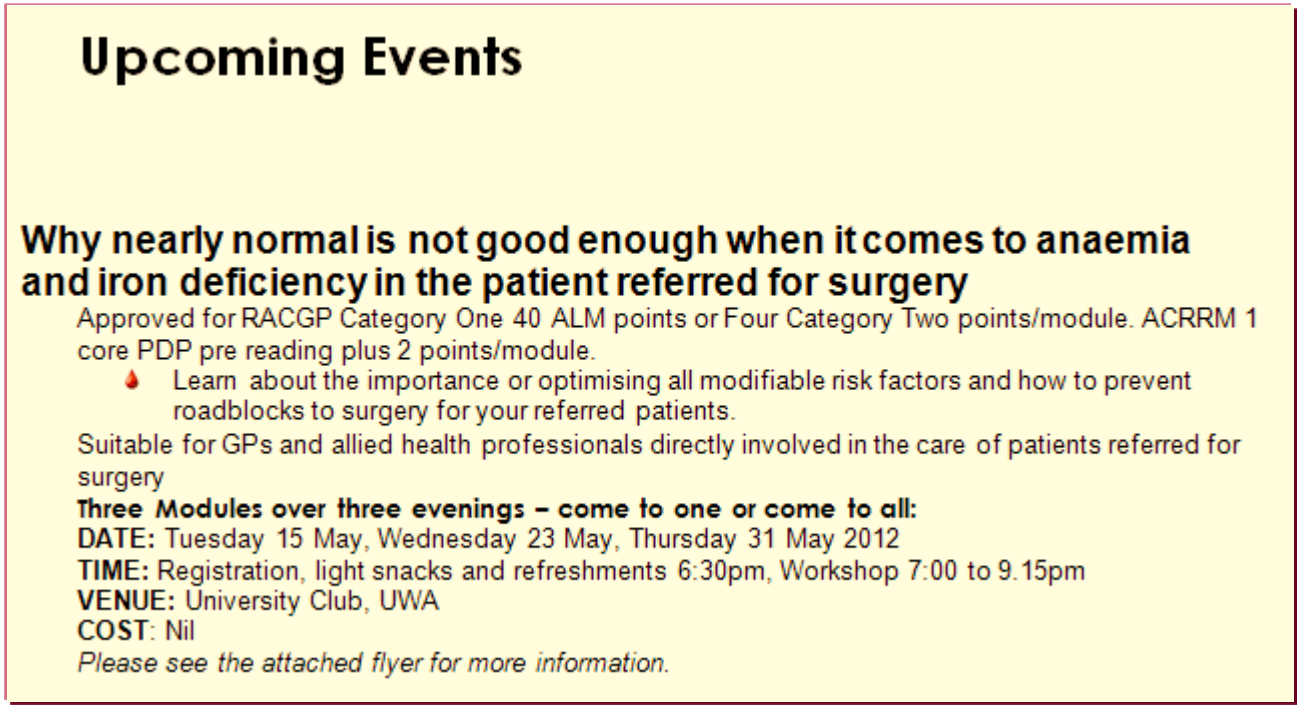
5. Reduce blood loss during surgery

- Cell salvage
- Administration of antifibrinolytics
- Haemodilution techniques
- Point-of-care coagulation testing
- ROTEM® and Multiplate®



Involving GPs in anaemia management

"Fremantle Hospital has been awarded a Research Translation Project grant for their project 'Primary care and tertiary care clinicians working with patients to ensure they are "Fit for Surgery." This project seeks to involve the GP in the identification and management of anaemia and other morbidities such as iron deficiency that affect fitness for surgery, prior to attendance at preoperative clinics and admission for surgery."



Upcoming Events

Why nearly normal is not good enough when it comes to anaemia and iron deficiency in the patient referred for surgery

Approved for RACGP Category One 40 ALM points or Four Category Two points/module. ACRRM 1 core PDP pre reading plus 2 points/module.

- Learn about the importance or optimising all modifiable risk factors and how to prevent roadblocks to surgery for your referred patients.

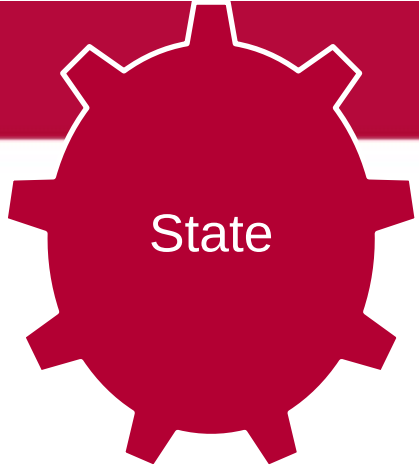
Suitable for GPs and allied health professionals directly involved in the care of patients referred for surgery

Three Modules over three evenings – come to one or come to all:
DATE: Tuesday 15 May, Wednesday 23 May, Thursday 31 May 2012
TIME: Registration, light snacks and refreshments 6:30pm, Workshop 7:00 to 9.15pm
VENUE: University Club, UWA
COST: Nil
Please see the attached flyer for more information.


Patient Blood Management in practise:
2nd sternotomy combined aortic valve replacement and coronary artery bypass graft surgery
RBCs txed = 0
Plts txed = 0
FFP txed = 0
Dr Manuel Estioko
Saint John's Health Center
Santa Monica California
USA

Patient Blood Management program

State based approaches



1. State Health Executive Forum
   - Funding
   - Access
2. State PBM Steering Committee
3. State PBM Research Committee
4. Staffing in hospitals
5. Partnerships
   - Public and private
   - Academic institutions
   - ARCBS

Patient information fact sheet

About Patient Blood Management

Patient Blood Management (PBM) is a new standard of care in medicine and surgery to manage and conserve a patient's own blood, reducing reliance on the donor blood supply.

Why Patient Blood Management is good for patients

Recent studies suggest that if patient blood management strategies are used and transfusion is reduced or avoided, patients have:

- fewer complications
- faster recoveries
- shorter stays in hospital.

Government of Western Australia
Department of Health

WA Patient Blood Management Program

Delivering a Healthy WA

- **Infectious risks**
  Although all donor blood is carefully screened and tested, there is an extremely low chance that blood transfusions can transmit infectious agents such as bacteria, viruses and parasites. This is due to the possibility of new infectious agents entering the population, and hence the blood supply, before tests are developed. Blood can also get contaminated with tiny amounts of skin bacteria while being collected from the donor, sometimes resulting in serious complications for the patient. Improved collection and storage techniques have more significantly reduced this risk.
- **Wrong blood transfused**
  Although strict procedures are used to make sure patients get the right blood product, the potential for a patient to receive the wrong blood (meant for someone else) exists and can result in serious medical problems.

The priority of PBM is the management and preservation of patients' own blood. Donor blood is reserved for use only with patient consent and where there is evidence that it will be beneficial, or where there are no other options and the risks have been considered and balanced against the benefits.

Why Patient Blood Management is good for the blood supply

is becoming increasingly costly and difficult to maintain an equate and safe blood supply. Stock is sometimes at very low vels. The age group of potential donors is shrinking, and the age oup that uses the most blood is increasing. Vigilant screening and sting for potentially infectious agents result in increased donor clusions and dramatically increase the cost of blood. These allenges will grow as the population ages. PBM can significantly uce demand on already stretched blood supplies. The Australian d Cross Blood Service has always advocated appropriate use of od and blood products and enthusiastically endorses the WA PBM gram.

How does Patient Blood Management work?

PBM involves three basic principles:

1. **Optimise the patient's blood levels well before a surgical or medical intervention:**
   - Optimising the patient's blood levels four to six weeks prior to surgery – essentially assisting the body to be its own blood bank.
   - Identifying and treating anaemia (low blood levels of haemoglobin).
   - Identifying and treating iron deficiency (low iron levels).
   - Identifying any coagulation abnormalities needing correction or management.
2. **Lose less blood throughout the patient's treatment:**
   - Certain medications, including some "natural" medicines and herbal and vitamin preparations, can increase bleeding or clotting at the time of a procedure. These may need to be stopped anywhere from a few days to a number of weeks before a procedure.
   - Some underlying diseases can interfere with the blood's ability to clot. This may increase bleeding during a procedure and therefore may require treatment ahead of time.
   - Advanced as well as conventional surgical tools and techniques can be used to reduce bleeding.
   - A number of anaesthetic techniques can be used, such as controlling blood pressure, maintaining normal body temperature, and collecting and "recycling" the patient's own blood during and after the procedure.
   - Medications that reduce bleeding can be given.
   - Smaller and less frequent samples of blood can be taken for tests.

...appropriate management, the body can tolerate lower blood levels of haemoglobin than previously thought, without resorting to blood transfusion.
- Blood-building medications and nutritional support can help the body make its own new blood more rapidly.

When these three principles are applied in a coordinated team approach, the majority of elective procedures can be performed without blood transfusion, which results in better outcomes for patients.

When will Patient Blood Management be available to Western Australians?

PBM will be implemented across the entire WA public health system over the next five years. Local, national and international experts in the field of PBM will lead an education program to familiarise doctors, nurses, scientists and other allied health professionals with this new standard of care.

Where can I get more information?

Your GP or specialist can explain transfusion risks, benefits and alternatives.

Before your surgical or medical intervention, you may wish to ask questions such as:

For your GP

- Am I anaemic or are my iron levels low?
- If so, how can it be treated before my procedure?
- Are there any medications, herbal or vitamin supplements I should stop taking before my procedure?

...specialist

- Is there a possibility of blood transfusion with my planned procedure?
- Besides the risk of infection, are there other complications from transfusion that I should be aware of?
- What options are available to avoid transfusion in my procedure?
- If it gets to a point where you think a transfusion becomes unavoidable (your doctor should explain why a transfusion is necessary), can you limit the amount of blood you give me?

As a patient you have the right to participate in the decision-making process. When it comes to medical procedures you need to give permission, or what is called "informed consent." If you have any questions, concerns or objections it is extremely important that you discuss them with your doctor.

About informed consent

Patient First – Government of Western Australia Department of Health
www.safetyandquality.health.wa.gov.au/involving_patient/informed_consent.cfm

The following websites may also be useful:

The WA PBM Program
www.health.wa.gov.au/bloodmanagement

Australian Red Cross Blood Service – Donate Blood
www.donateblood.com.au

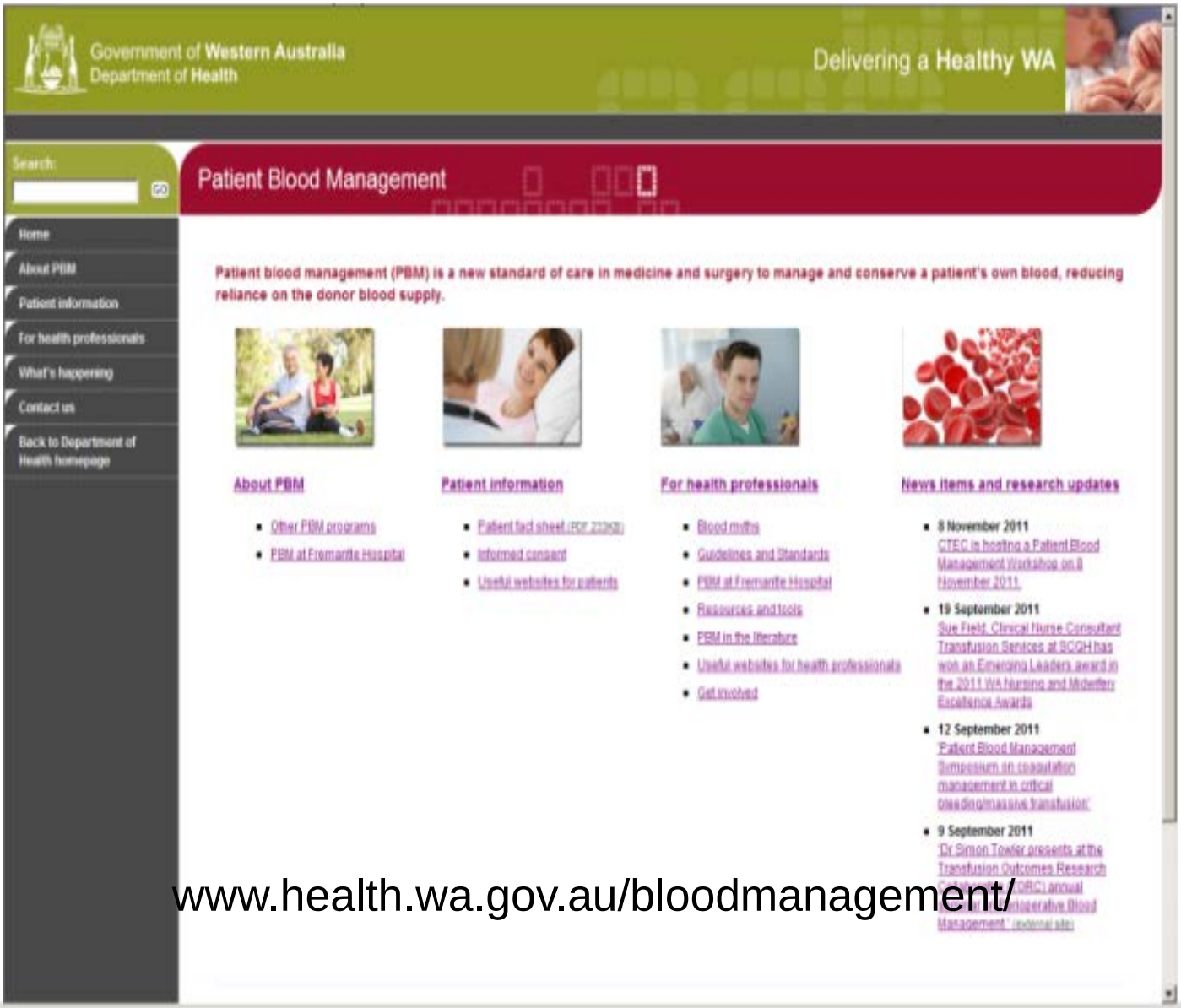
This document can be made available in alternative formats on request for a person with a disability.

Produced by Office of the Chief Medical Officer

Delivering a Healthy WA

Delivering a Healthy WA

Website for patients and clinicians

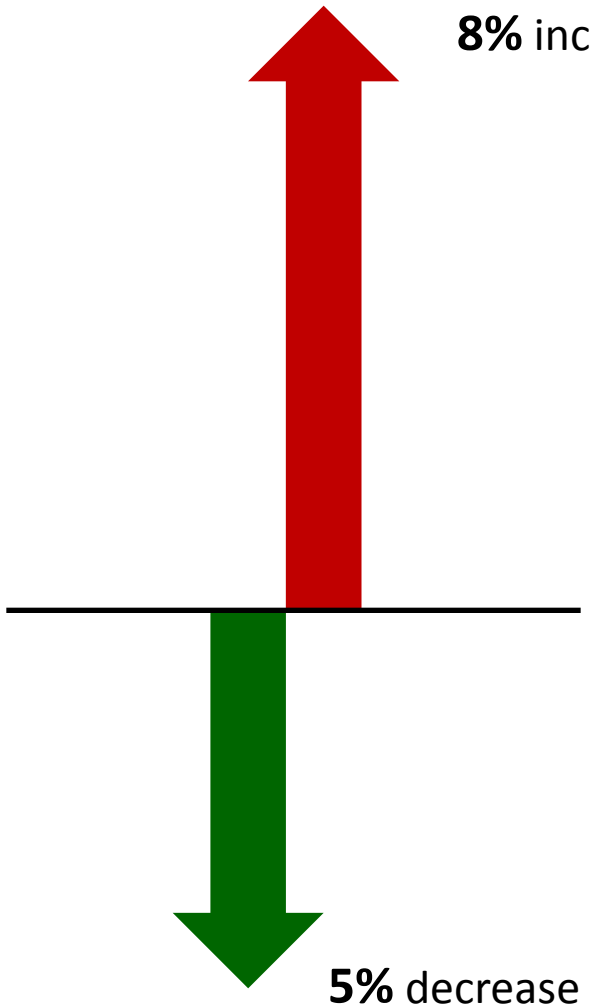


www.health.wa.gov.au/bloodmanagement/

Results:
Fremantle Hospital
Preliminary

Results from Fremantle Hospital pilot

1H2010 vs. 1H 2009 (Pre and post activity)



8% increase in activity (inpatient adm)

5% decrease in RBC usage

Knee Replacements

Using Health Roundtable (HRT)[1] data for 2011/12 for DRG I04

Produced by the Performance Unit,
South Metropolitan Health Service, Western Australia

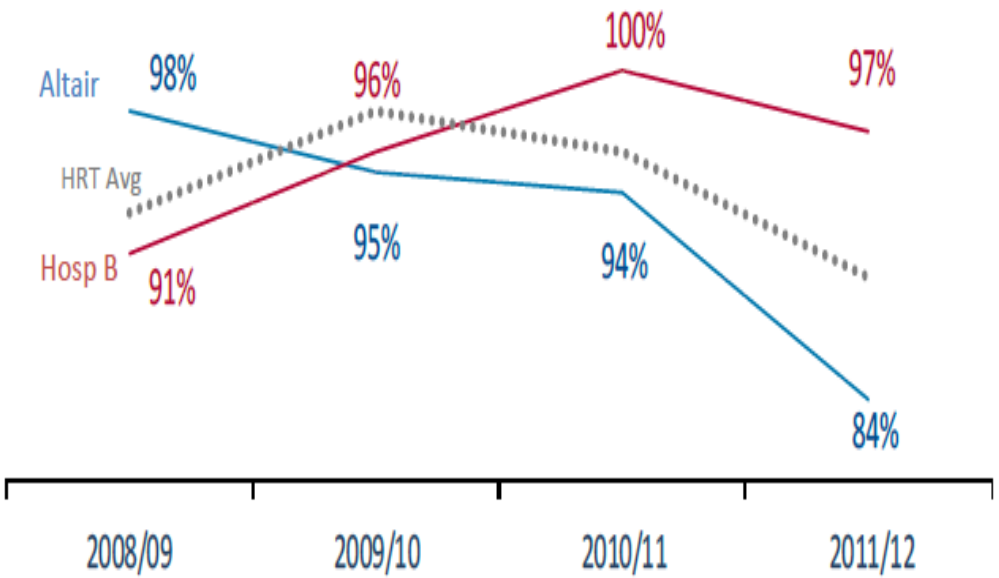
Hospital B's HRT CEO briefings:

The top 10 DRGs for potential improvement for Hospital B included I04: Knee Replacements. Altair was listed as an exemplar.

DRG	RSI	Savings	Exemplar
E62 RESPIRATORY INFECTN	87%	804	-
I75 INJ SH,ARM,ELB,KN,LEG,ANK	98%	744	-
B70 STROKE	84%	673	-
I68 NON-SURG SPINAL DSRD	87%	617	-
E65 CHRNIC OBSTR AIRWAY DIS	79%	549	-
I04 KNEE REPLACEMENT	97%	541	Altair

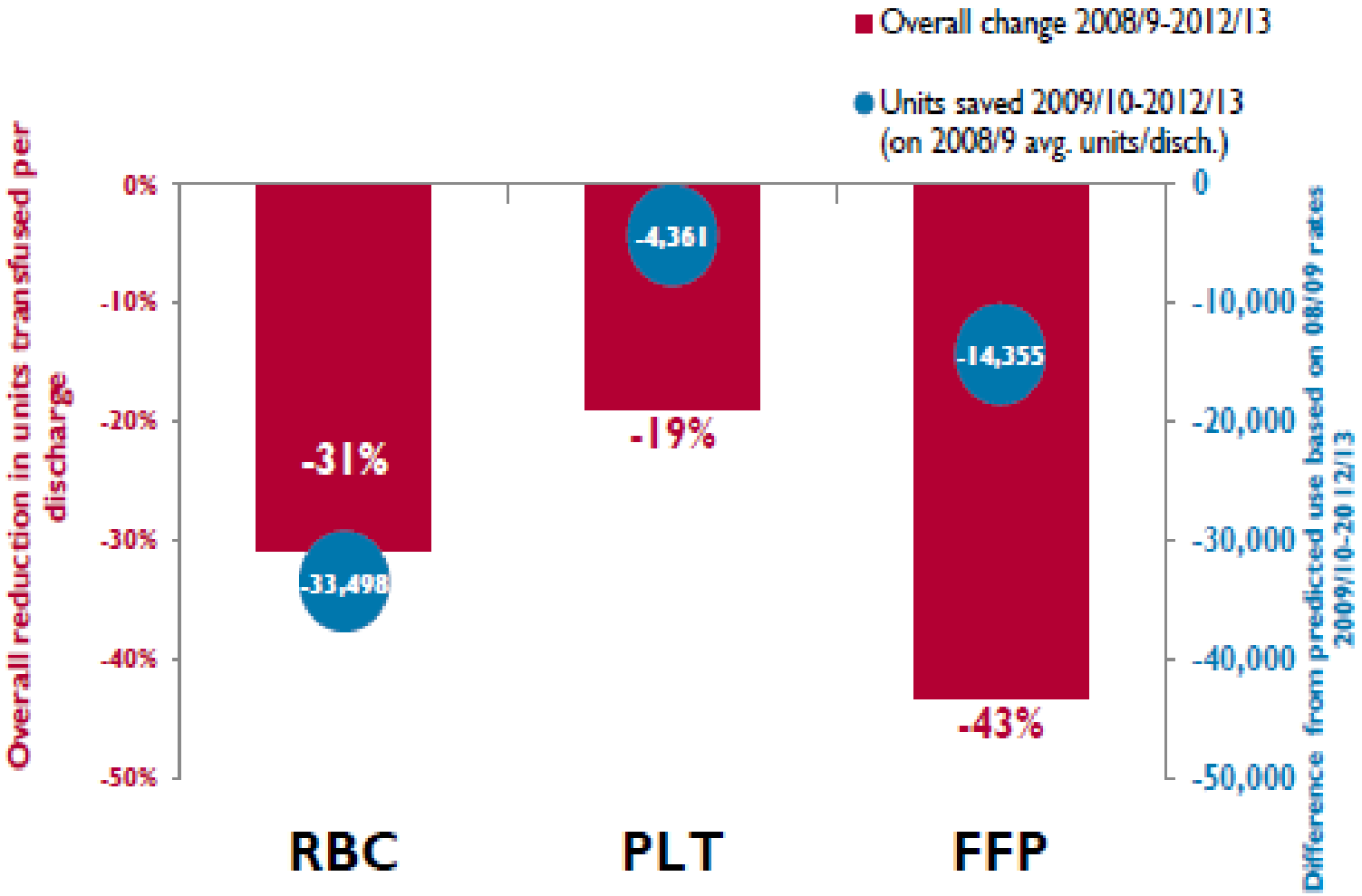
Trends in Length of Stay using HRT Relative Stay Index

Altair and Hospital B Knee Replacements



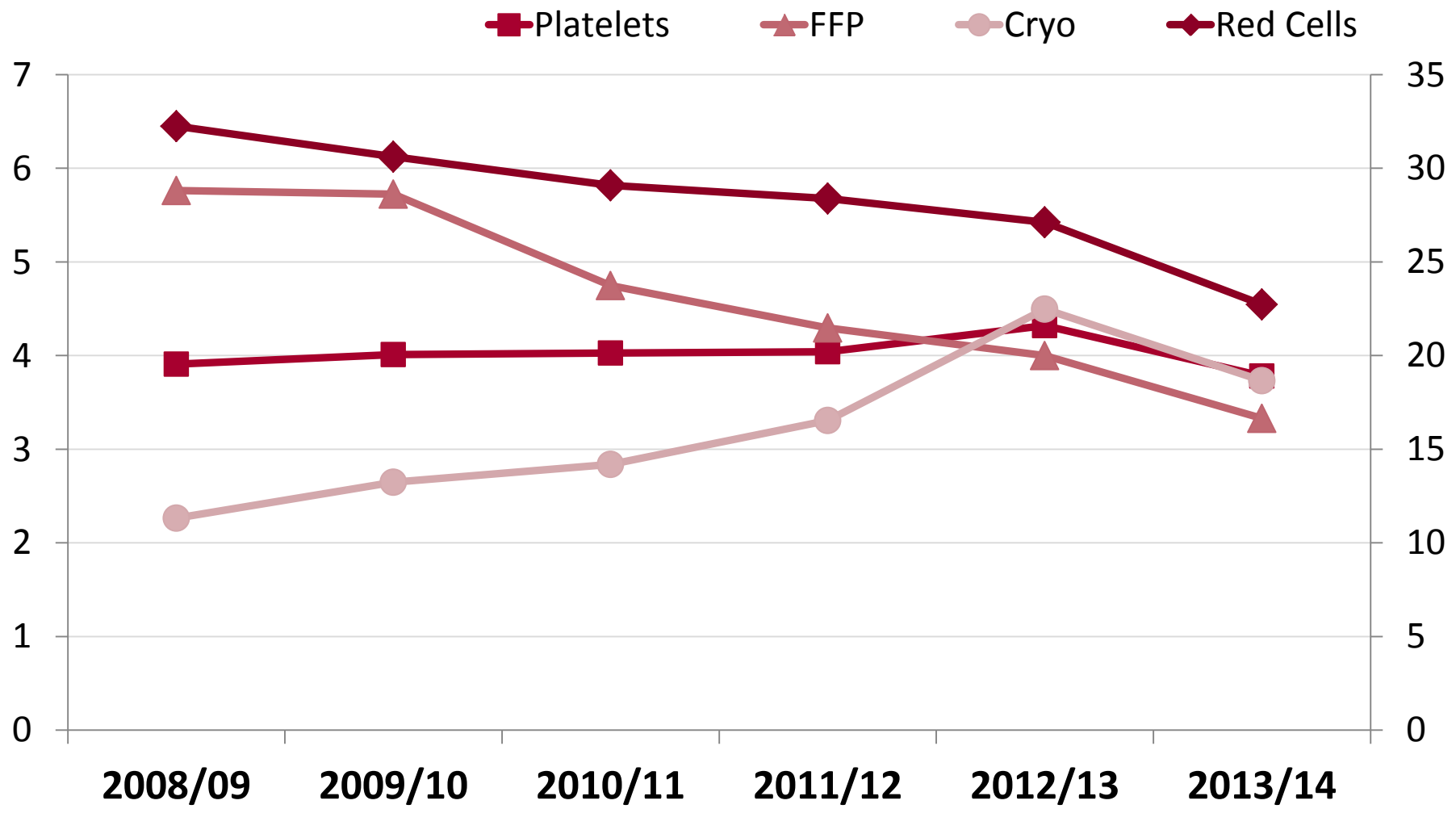
Altair, PBM Initiatives

WA Patient Blood Management Project



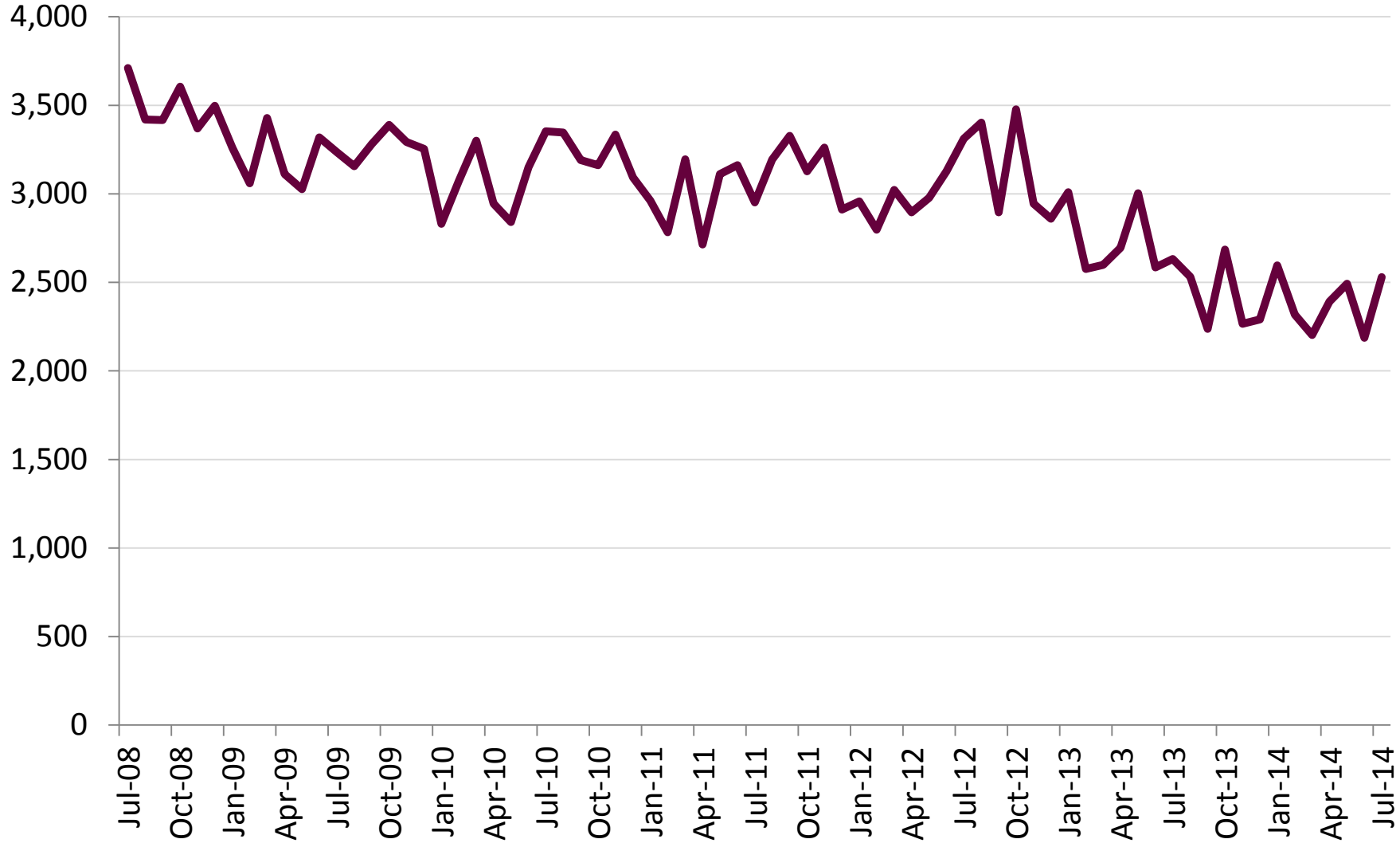
WA Fresh Blood Product ISSUANCE

1000 population, 2008/09 –2013/14



Monthly red cell issuance

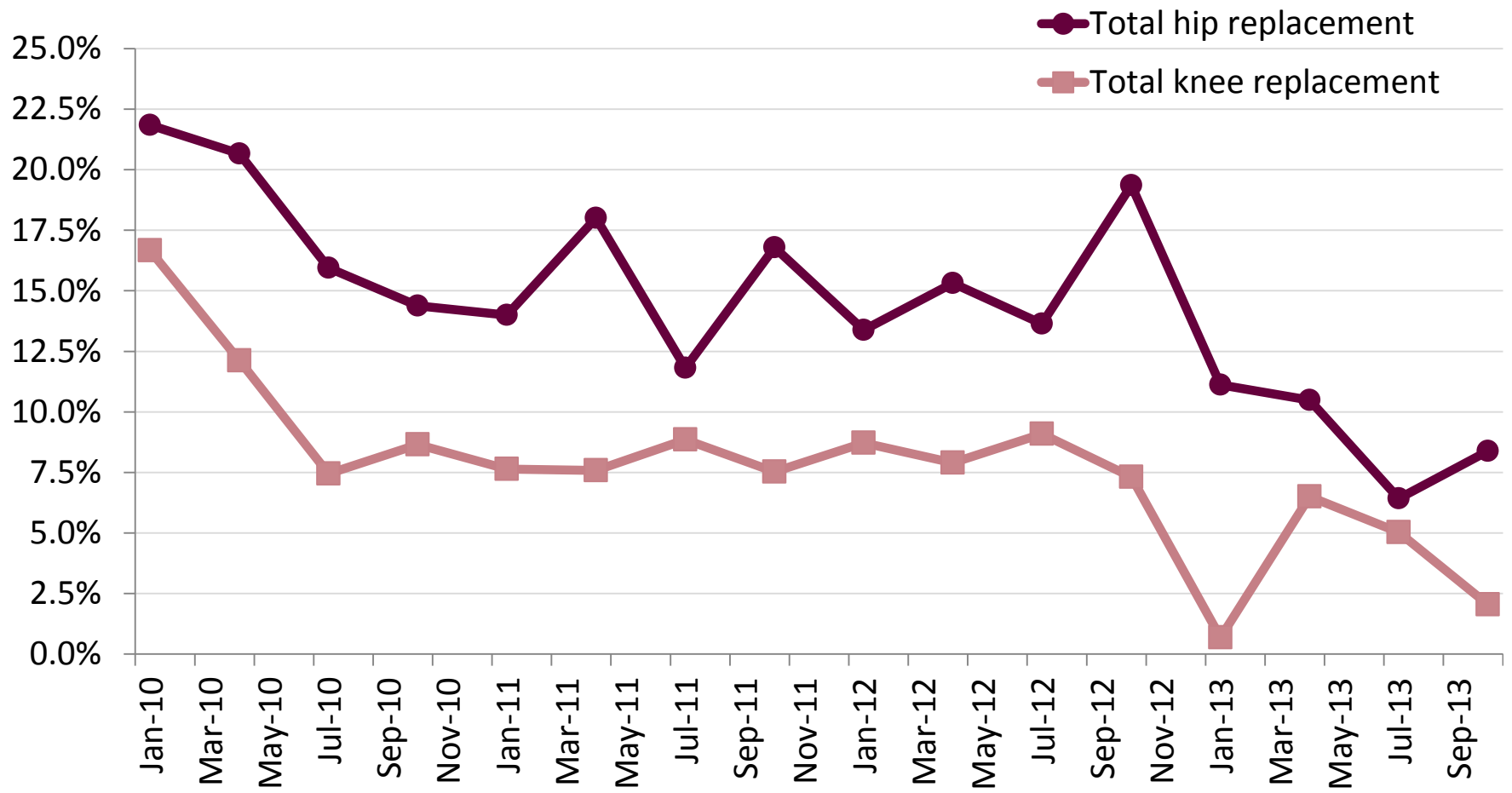
Public metropolitan hospitals



Elective primary total hip/knee replacement

Red cell transfusion rate

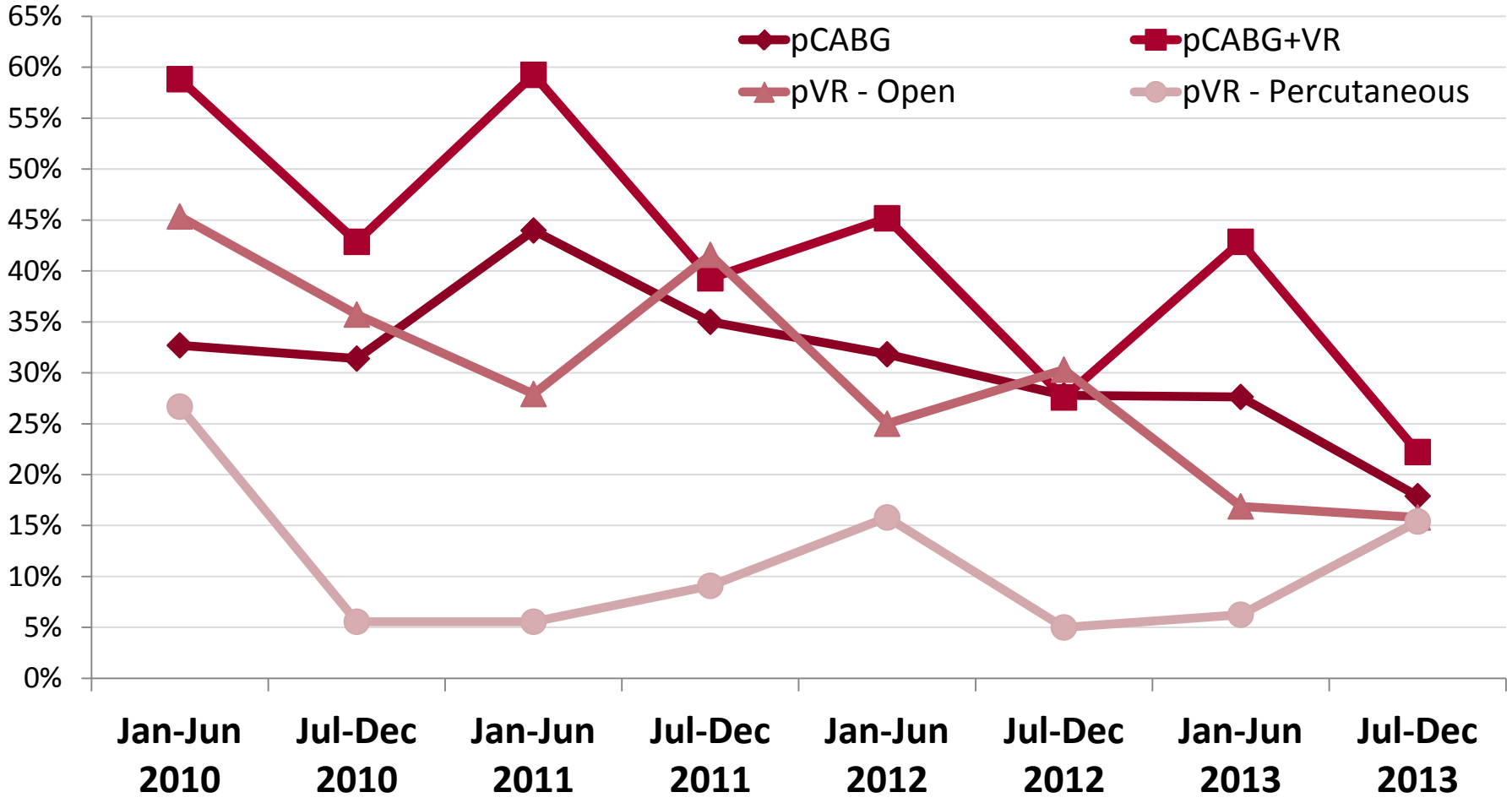
WA tertiary hospitals and associated general hospitals



Selected elective primary cardiac procedures

Red cell transfusion rate

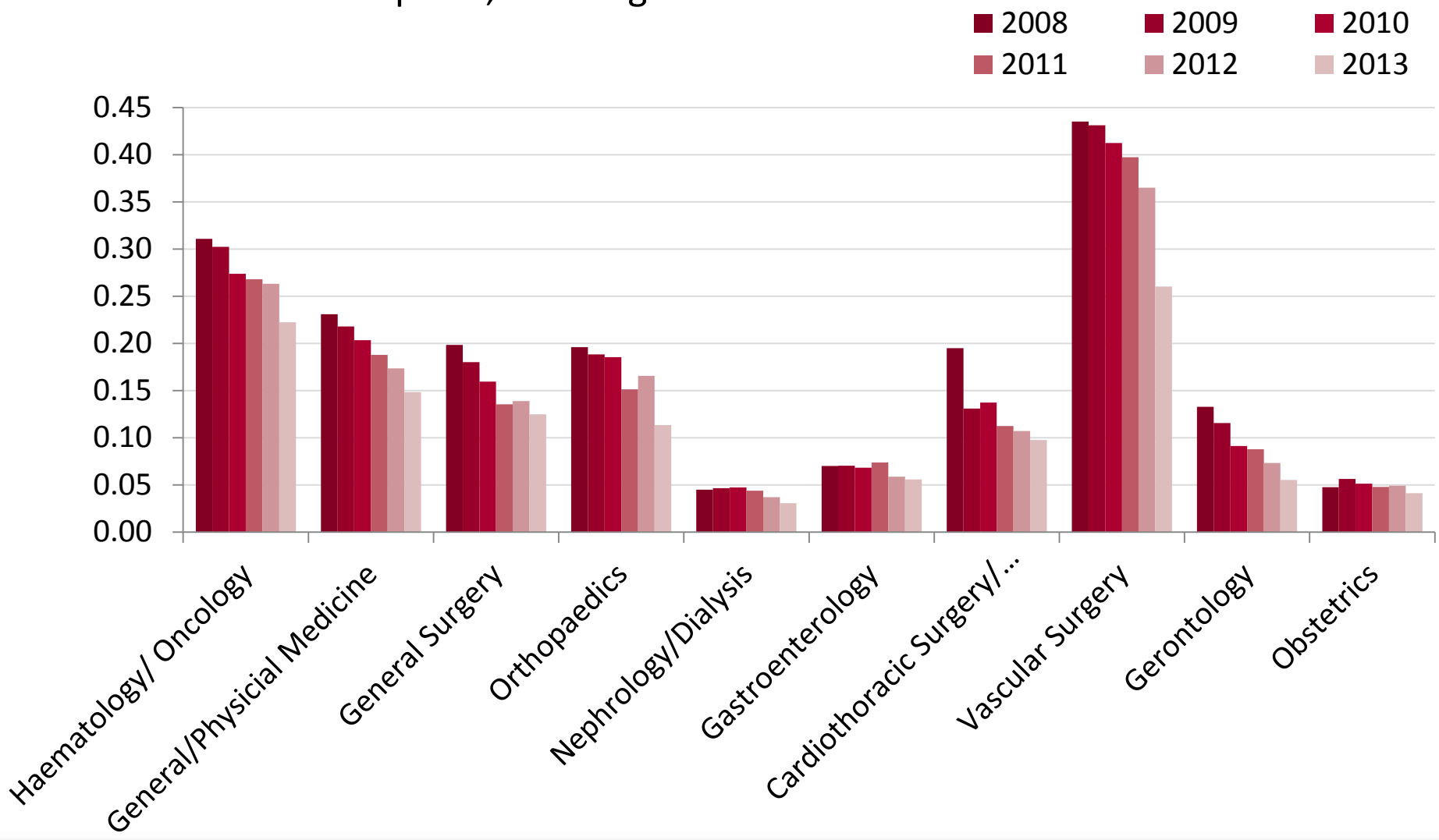
WA tertiary hospitals and associated general hospitals



Admitting Specialty

Mean red cells transfused per discharge

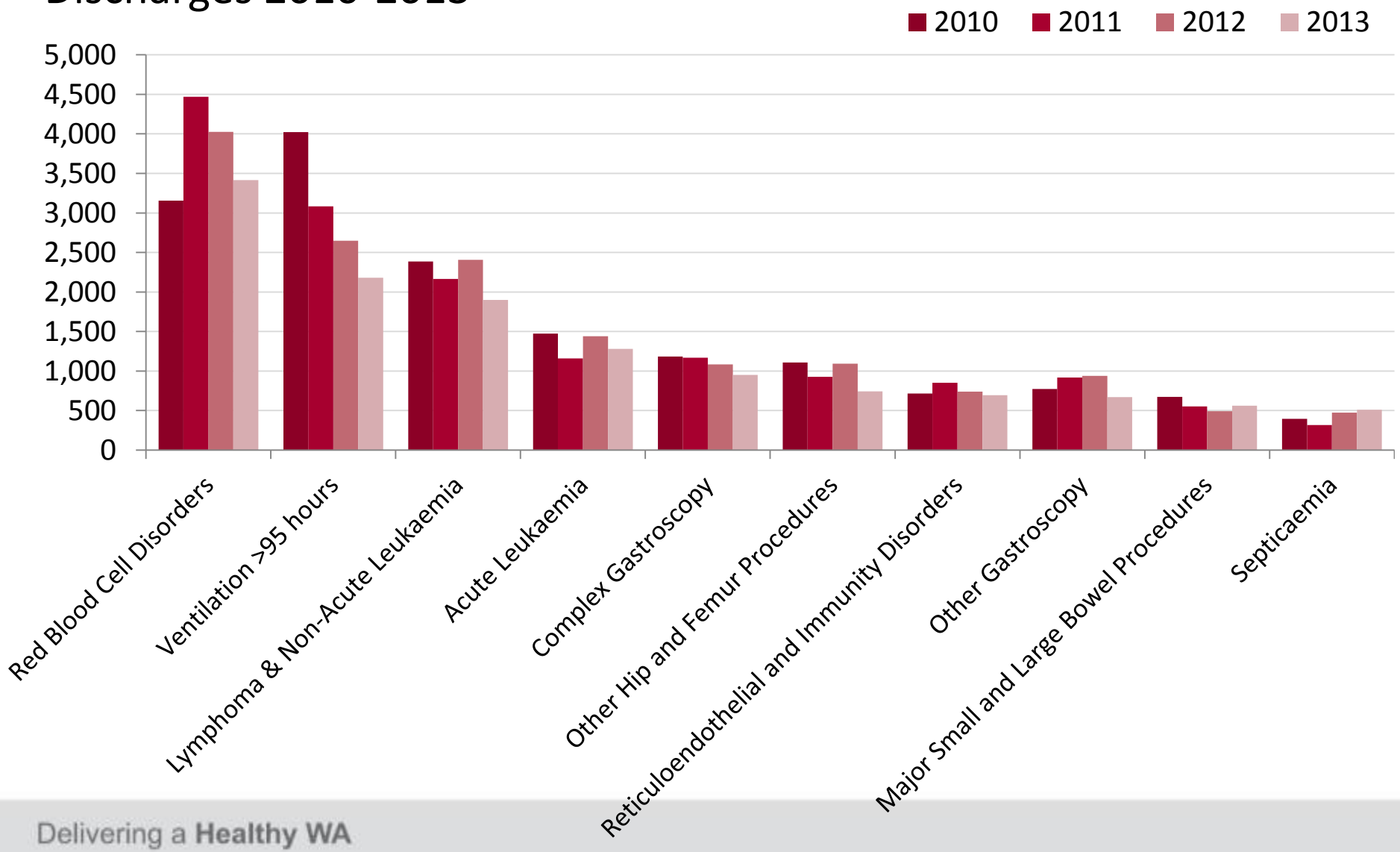
WA Public Metro Hospitals, discharges 2008-2013



Top 10 DRGs by total red cells transfused

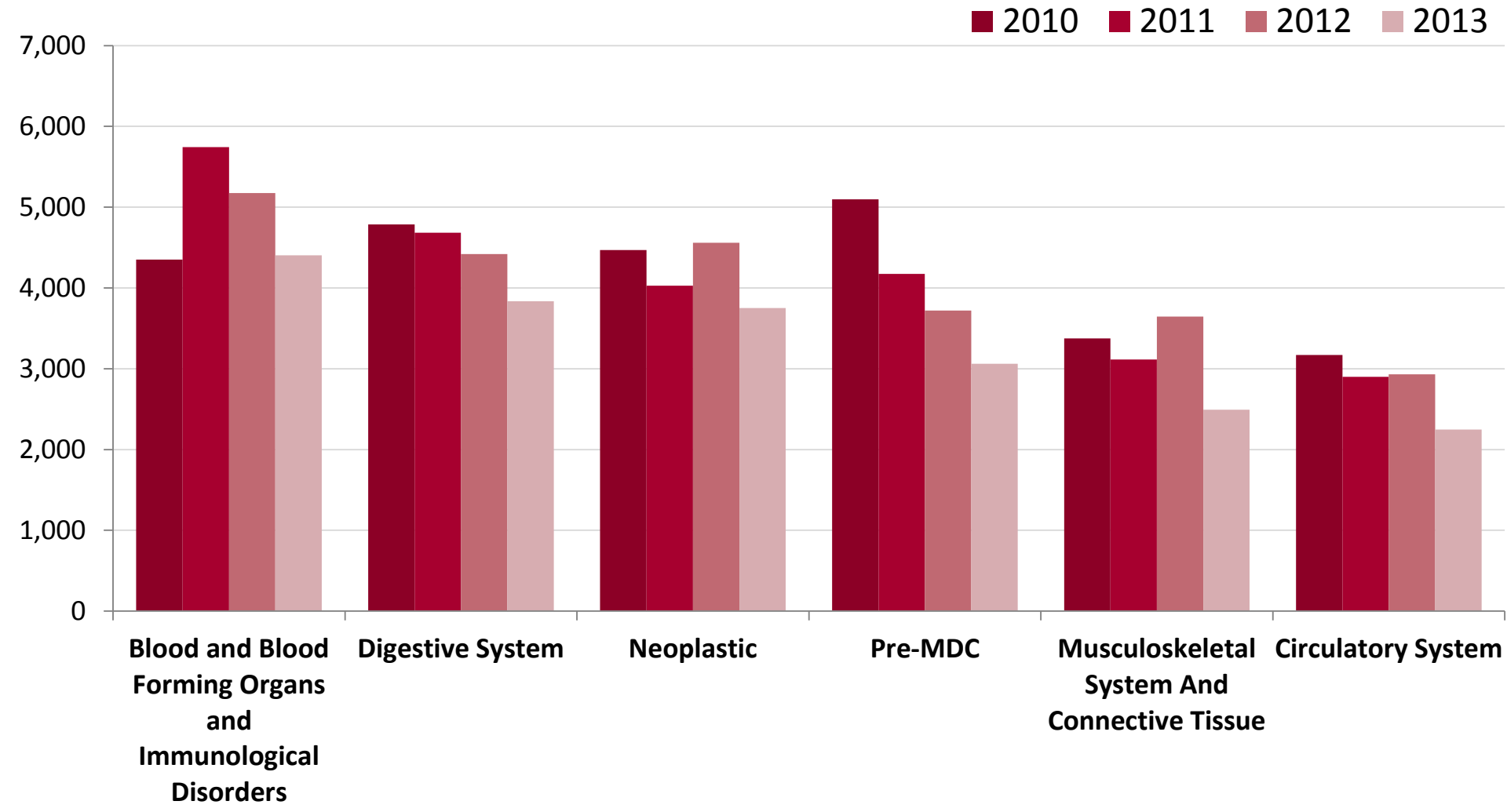
WA Public Metropolitan Hospitals (excluding SWDH)

Discharges 2010-2013



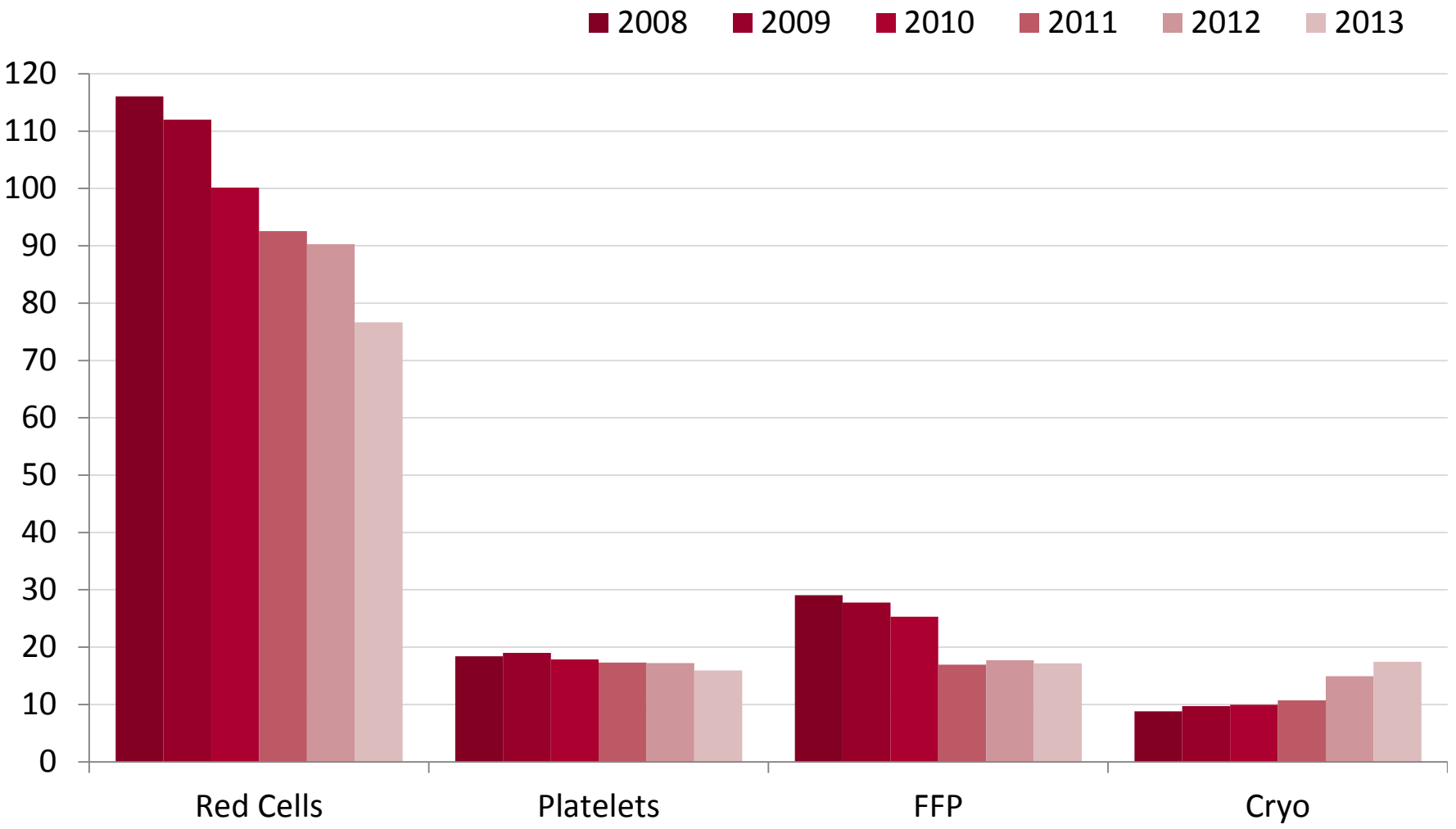
Top 6 MDCs by total red cells transfused

WA Public Metropolitan Hospitals (excluding SWDH)
Discharges 2010-2013

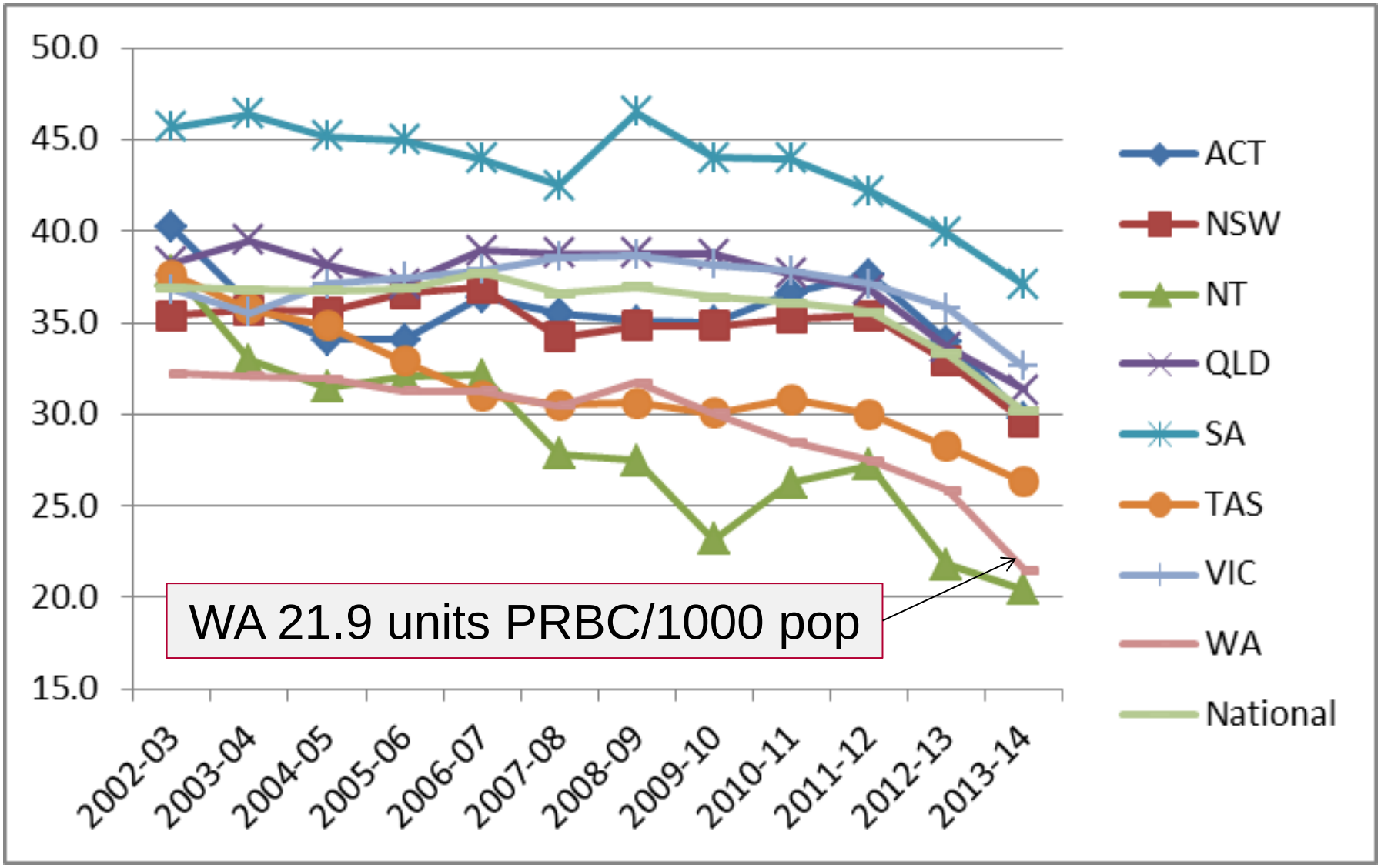


WA Fresh blood product TRANSFUSION

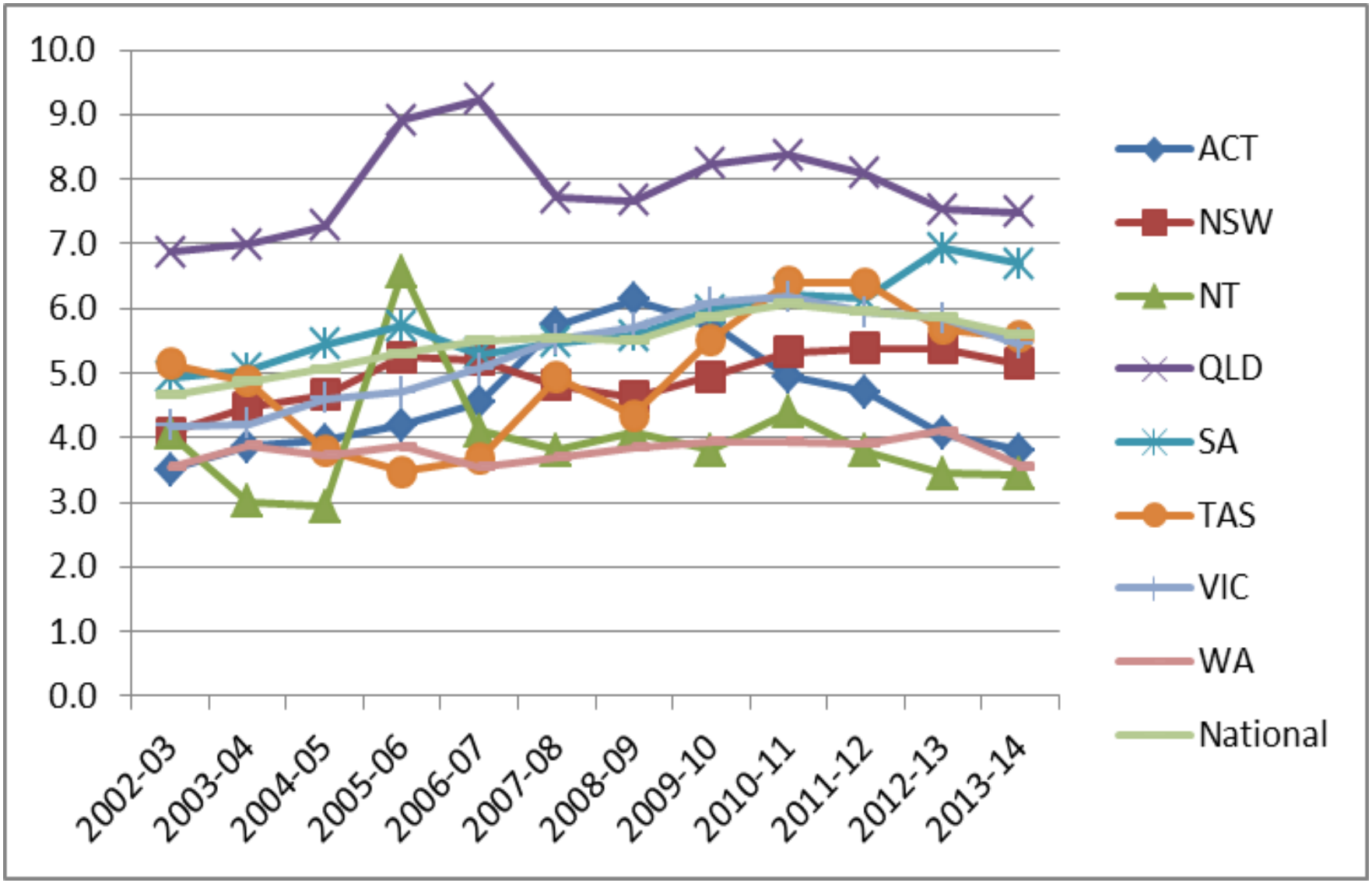
Units per 1000 separations, 2008-2013



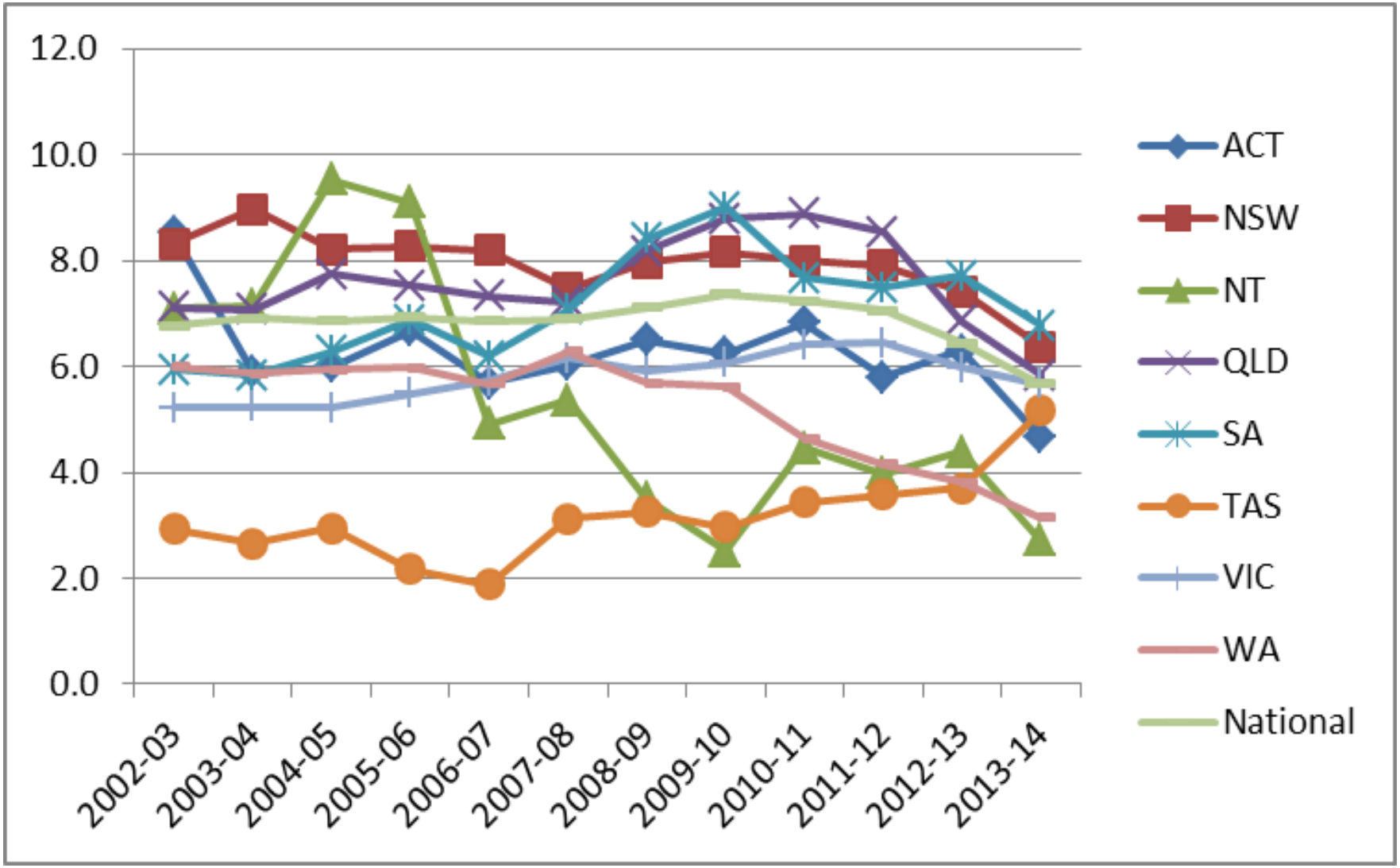
Australia - RBC Issuance – by jurisdiction – to 2014



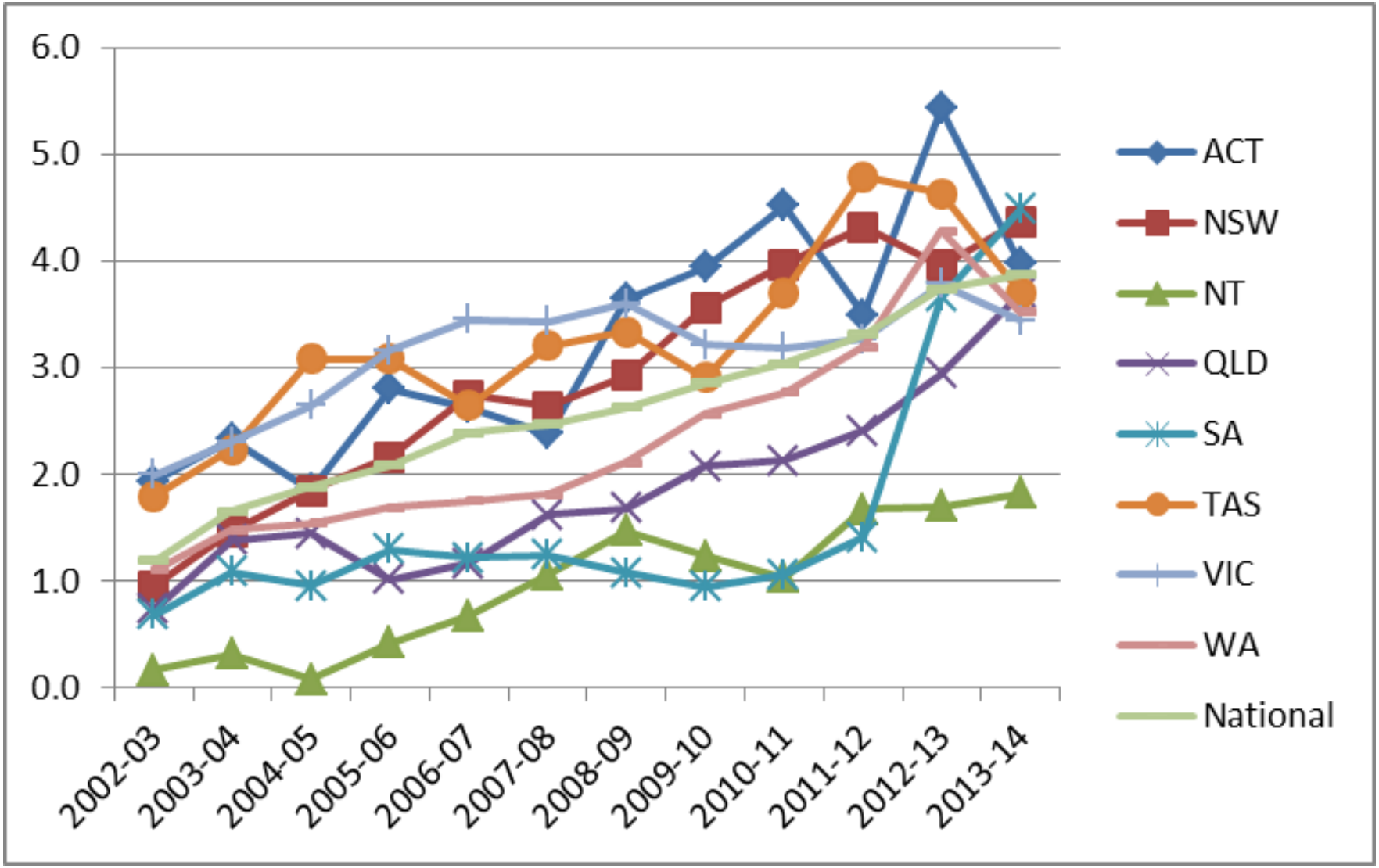
Australia – Platelet Issuance – by jurisdiction – 2014



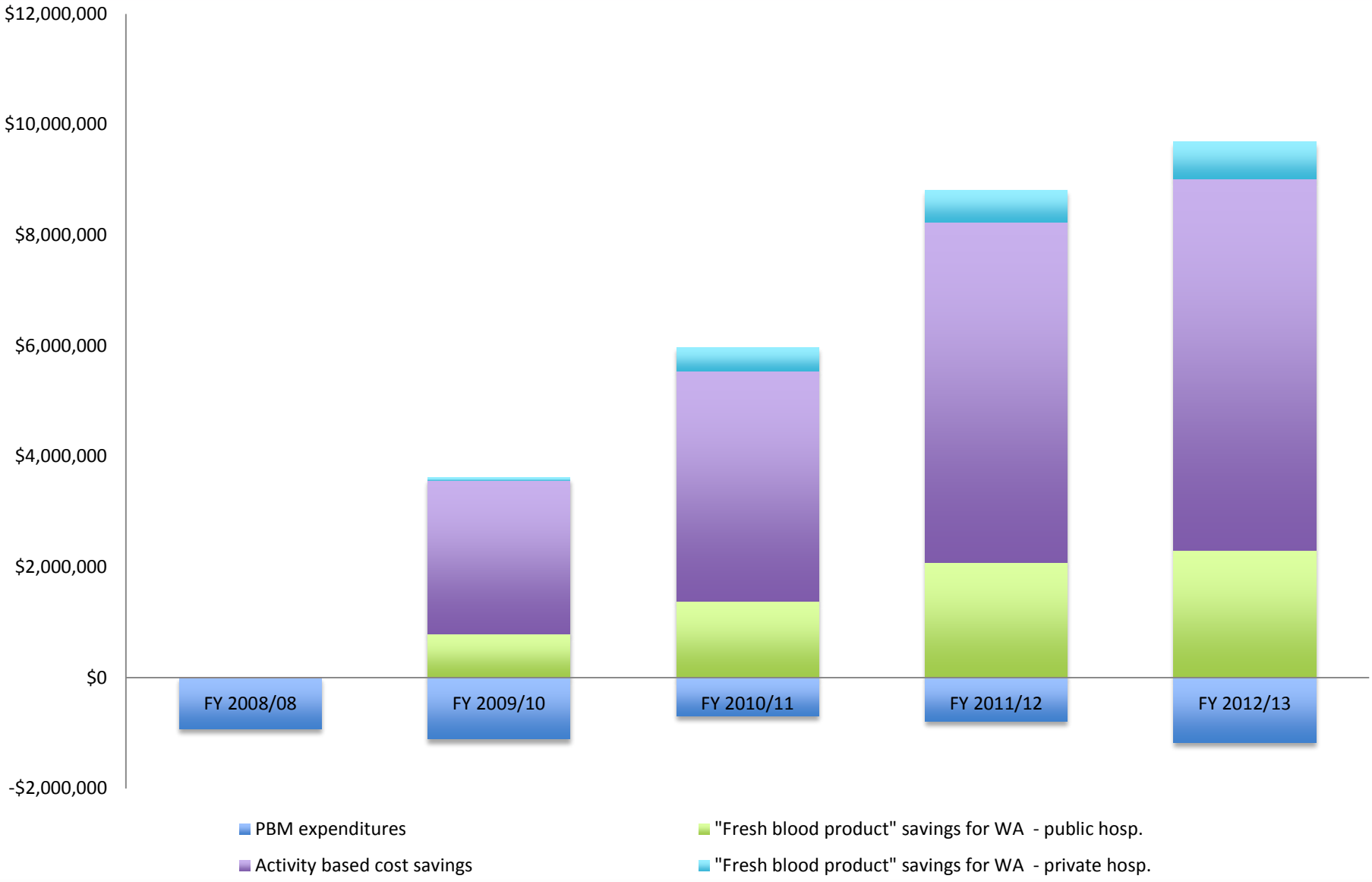
Australia – FFP Issuance – by jurisdiction – 2014



Australia – Cryo Issuance – by jurisdiction – 2014



Return on investment in Western Australia



Implementation of a Patient Blood Management Program

One Hospital's Experience in Changing Physician Practice and Hospital Culture

Irwin Gross, M.D.

Eastern Maine Medical Center

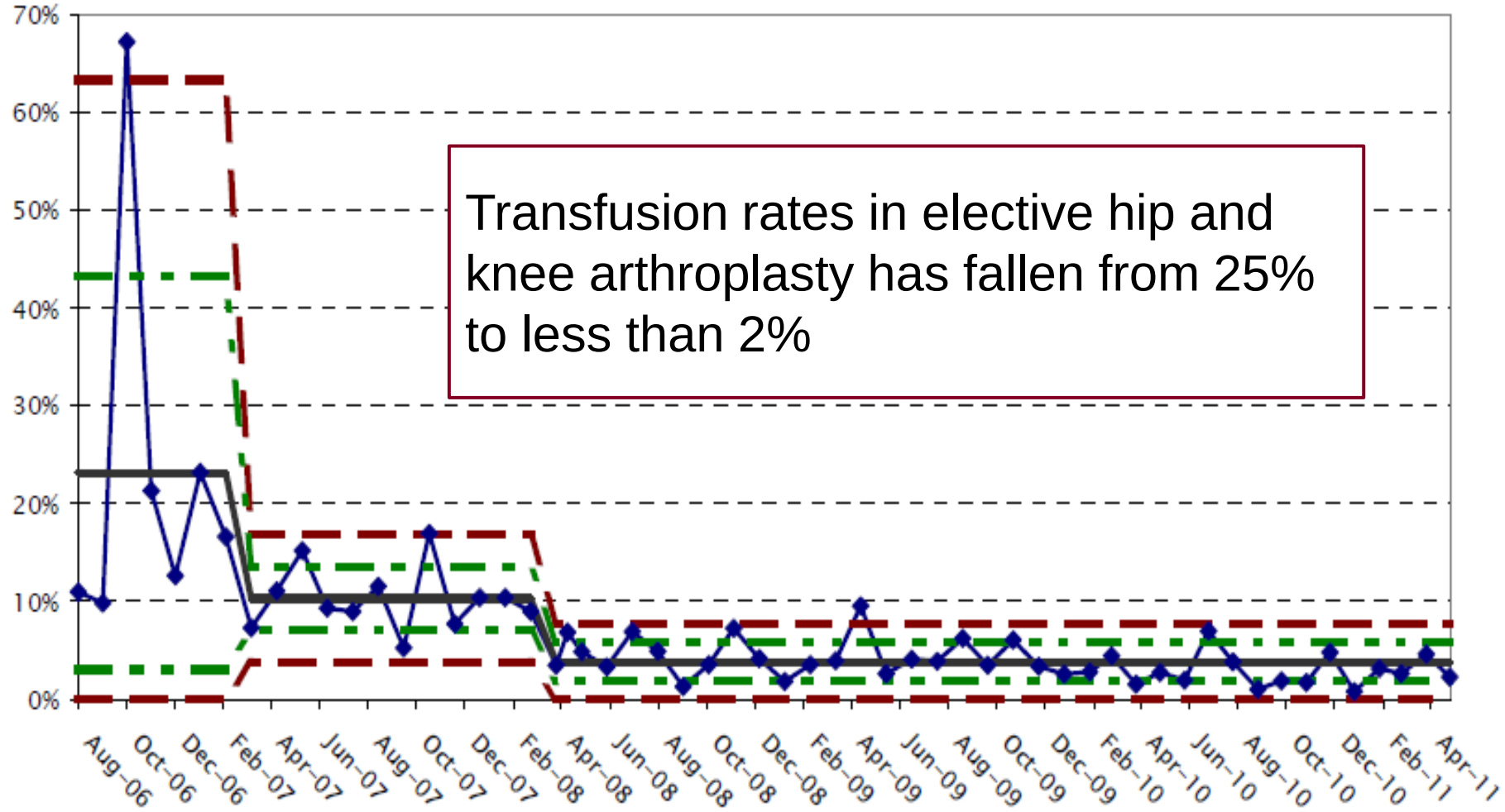
Bangor, Maine

Basics of Organizational Change

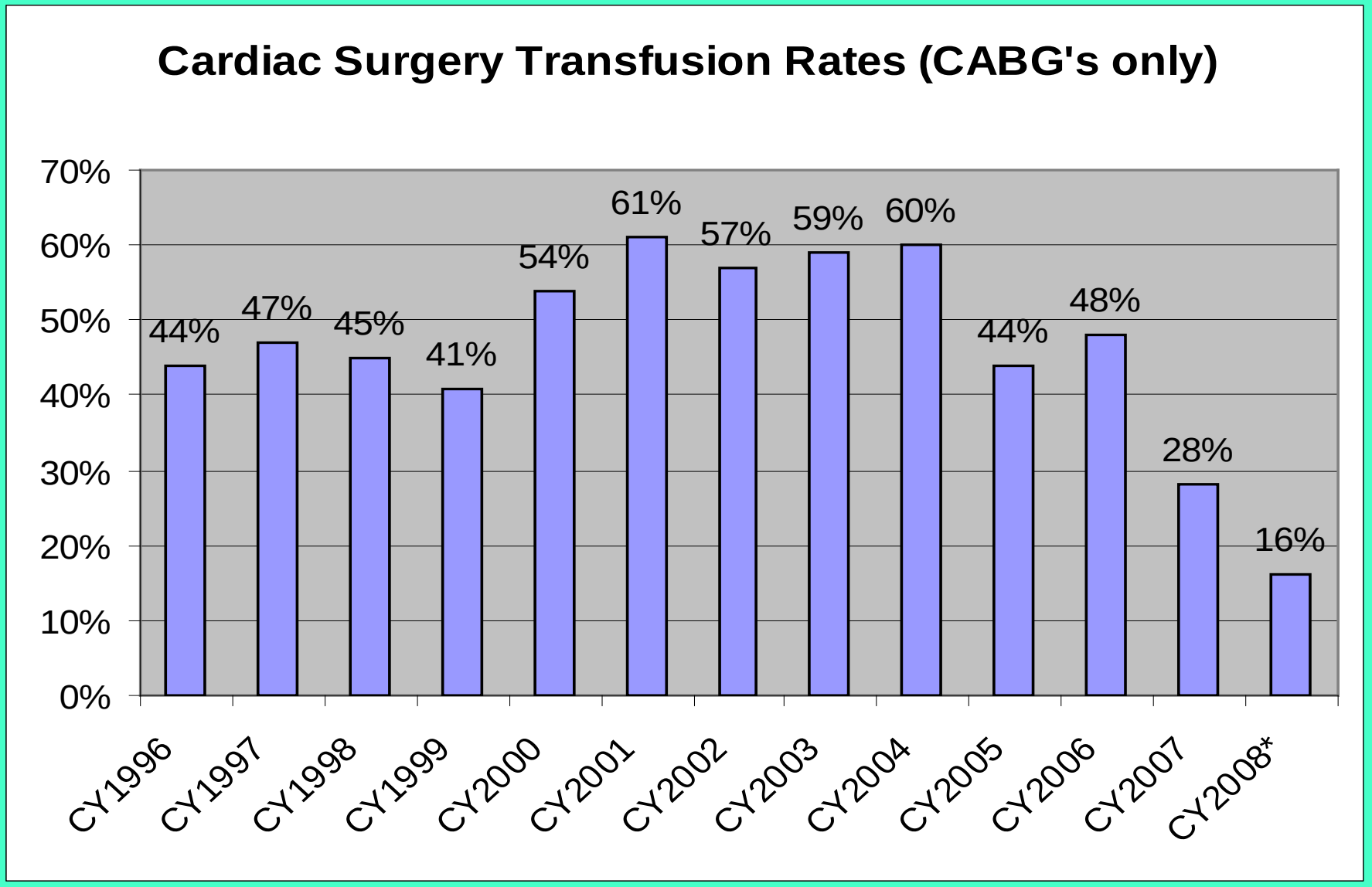
- Doesn't self-install
- All stakeholders must be engaged
- Anticipate resistance
- A scientific argument is necessary but not sufficient
- Change must be "hard-wired"

Impact Of Patient Blood Management at EMMC

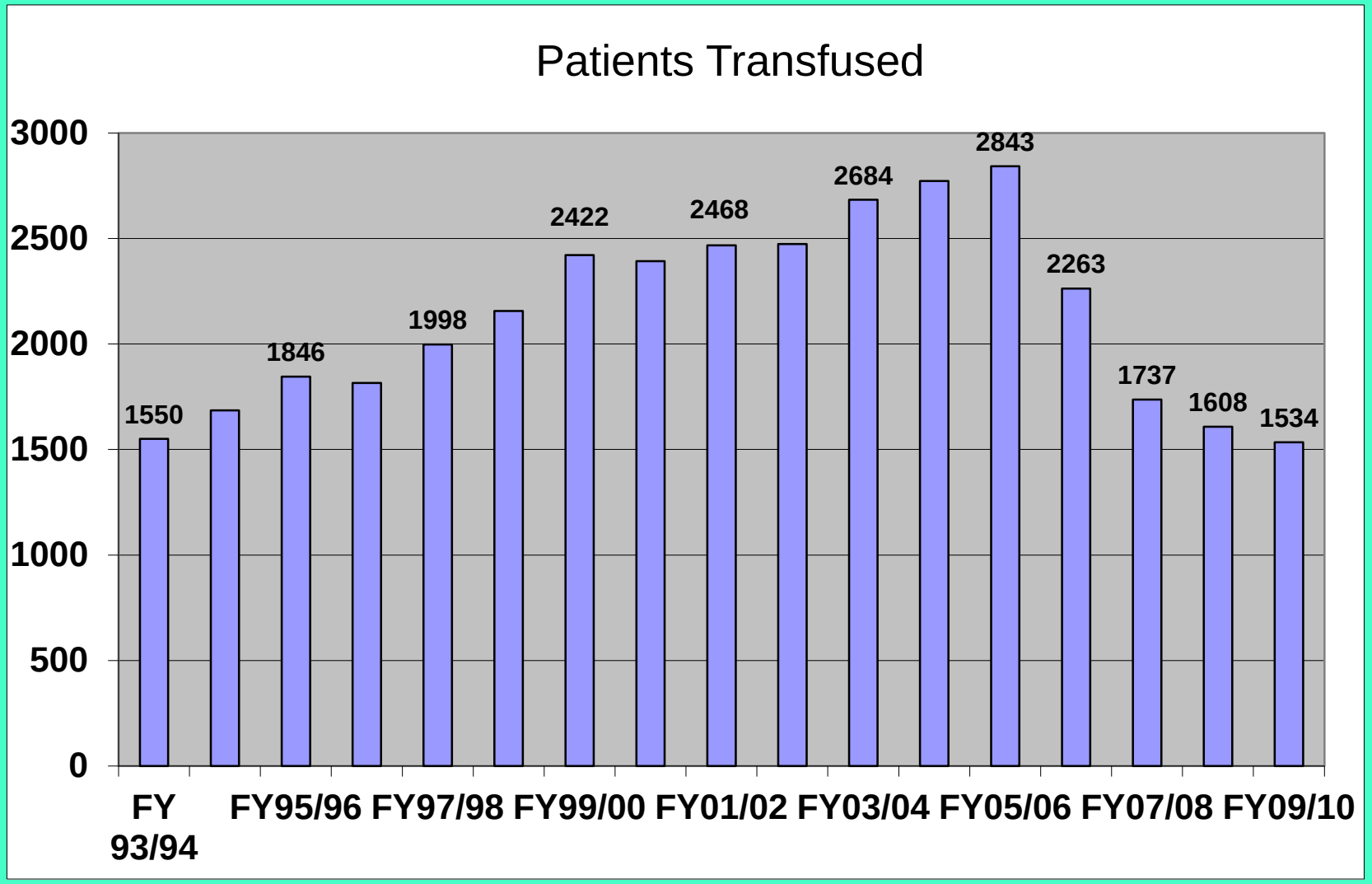
EMMC Orthopedics
Percent Inpatients Transfused



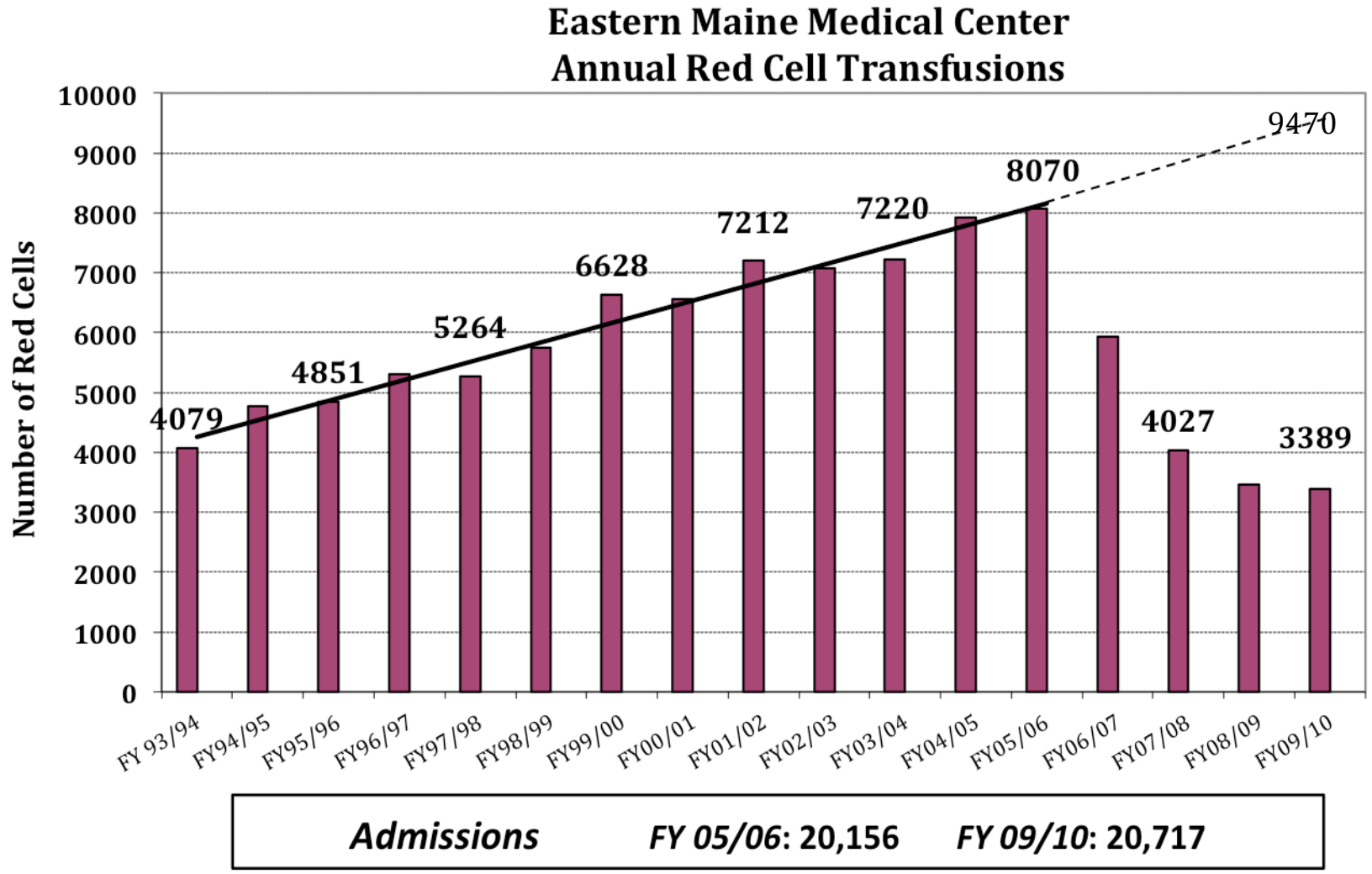
Results: Cardiac Surgery Transfusion Rates



Patients Transfused:
Financial Years 1994 - 2010

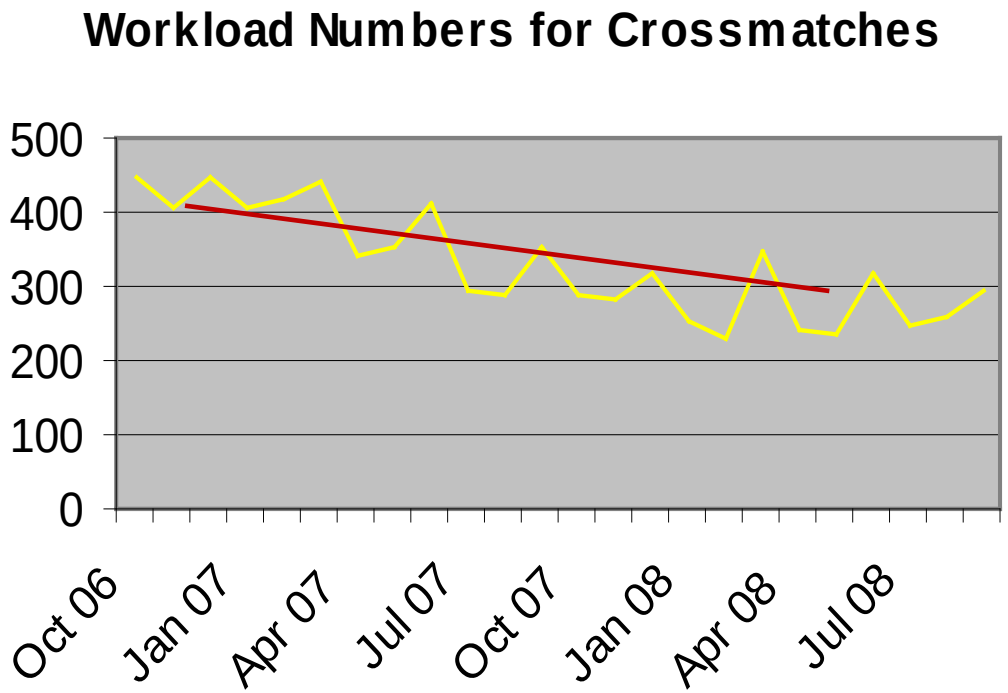


Red Cell Units Transfused
FY 1994 – FY 2010



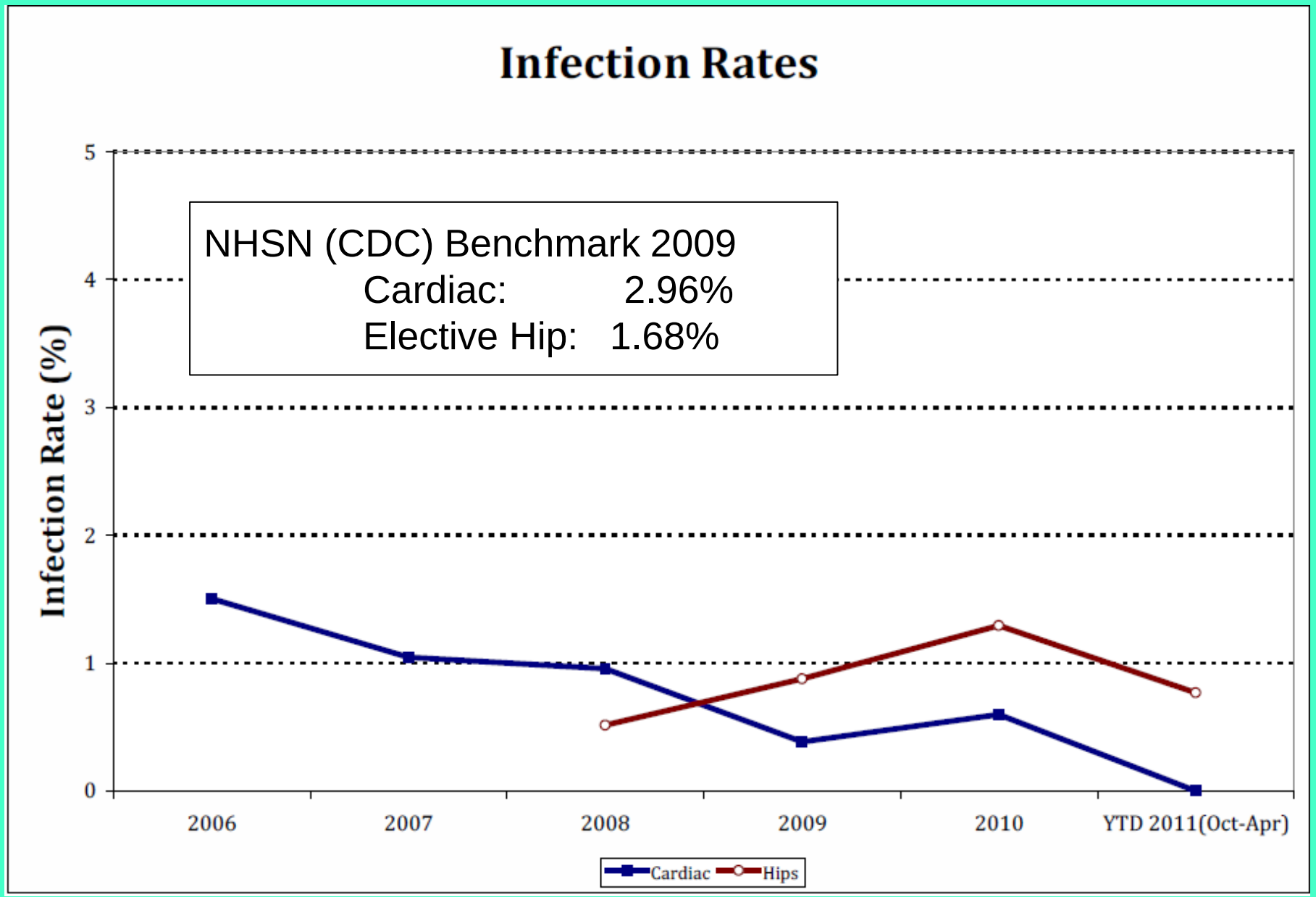
Impact on Blood Bank Staffing

- Decreased blood bank staff by 3 FTE



SSI Infection Rates

Cardiac Surgery and Hip Replacement



Blood Acquisition Cost Savings – All Components

- Total blood acquisition costs in FY ‘06 were $3,200,000
- Cost savings compared to base year, FY ’06*
  - FY ’07 $ 850,000
  - FY ’08 $ 1,400,000
  - FY ’09 $ 1,600,000
  - FY ’10 $ 1,550,000
  - **Total** **$ 5,400,000**

* No change in per unit cost from blood supplier from 2007 - 2010

Conclusions

- Significant variation in blood use across U.S. hospitals
- Over-utilization is common
- Changes in transfusion practice can occur quickly and can be “hard-wired” to be durable
- EMMC data suggest a 30 - 50% reduction in blood use nationally is a realistic goal with an associated savings in blood acquisition costs

SUSTAINING CHANGE

To put these changes into effect will require a **cultural shift** among **clinicians, managers,** and **policy makers**. No longer should **clinicians** prefer the convenience and immediate benefits of allogeneic transfusion over more troublesome but safer alternatives.

Mortimer PP. Editorial. Making blood safer: Stricter vigilance and fewer transfusions are the way forward.*British Medical Journal* 2002; 325:400-01

Transfusion Practice

Influence of knowledge and attitudes on the quality of physicians' transfusion practice

- Amount of transfused products was inversely proportional to physician knowledge of transfusion medicine
- Consultants - lower knowledge scores, greater confidence than residents
- >60% of residents inappropriate transfusion due attending pressure (once a month)

Salem-Schatz SR, Avorn J, Soumerai S B. JAMA 1990

NBA PBM Implementation Strategy

NATIONAL PATIENT BLOOD MANAGEMENT GUIDELINES IMPLEMENTATION STRATEGY 2013-2017

Better Management of Patients' Blood …

Better Patient Outcomes

NBA PBM Implementation Strategy

Key Implementation Activities

- Supporting existing activities
- PBM tool set
- Education and training
- Promotion and communication
- Data development

JAMA September 1999

Impact of Formal Continuing Medical Education: Do Conferences, Workshops, Rounds, and Other Traditional Continuing Education Activities Change Physician Behavior or Health Care Outcomes?

Dave Davis, MD; Mary Ann Thomson O'Brien, MSc; Nick Freemantle, PhD; Fredric M. Wolf, PhD; Paul Mazmanian, PhD; Anne Taylor-Vaisey, MI

What are you doing here? ;)

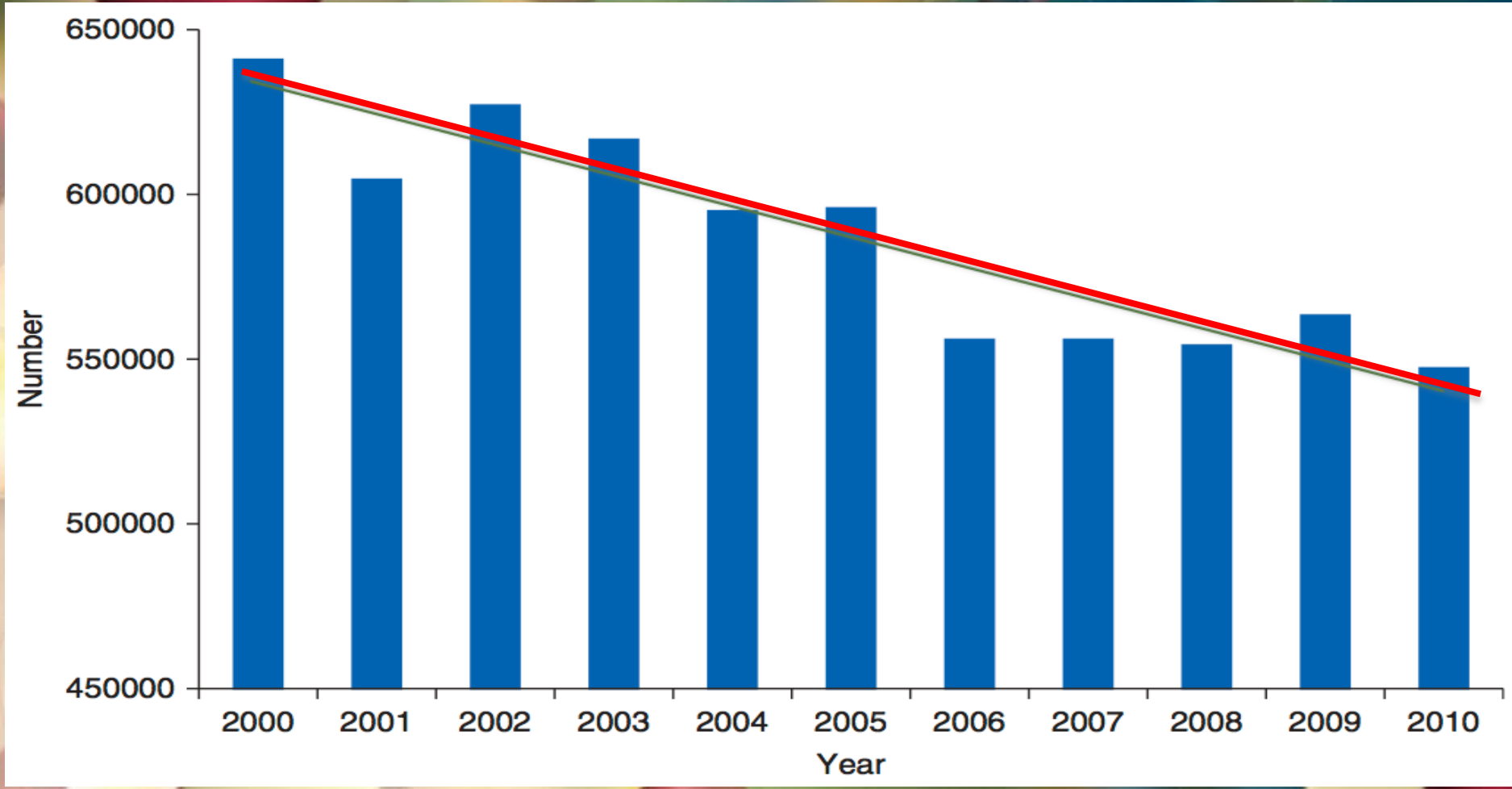
In the **rected learning and the general disinclination to believe that didactic CME works, now coupled with the findings of this review, why would the medical profession persist in delivering such a product and accrediting its consumption?**

The education revolution!

Patient Blood Management

Significant change is occurring internationally

Number of allogeneic transfusions in the Netherlands from 2000 to 2010

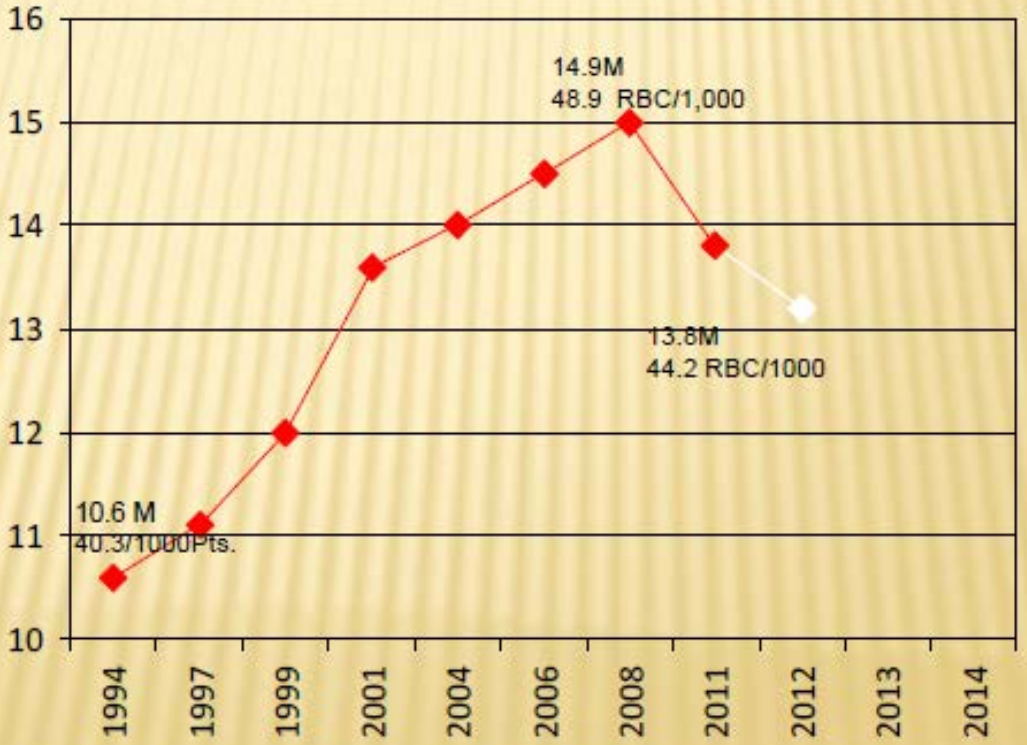


Shander A, et al. Br J Anaesth. 2012 Jul;109(1):55-68

FIRST EVER DROP IN TX. RATE/UTILIZATION!

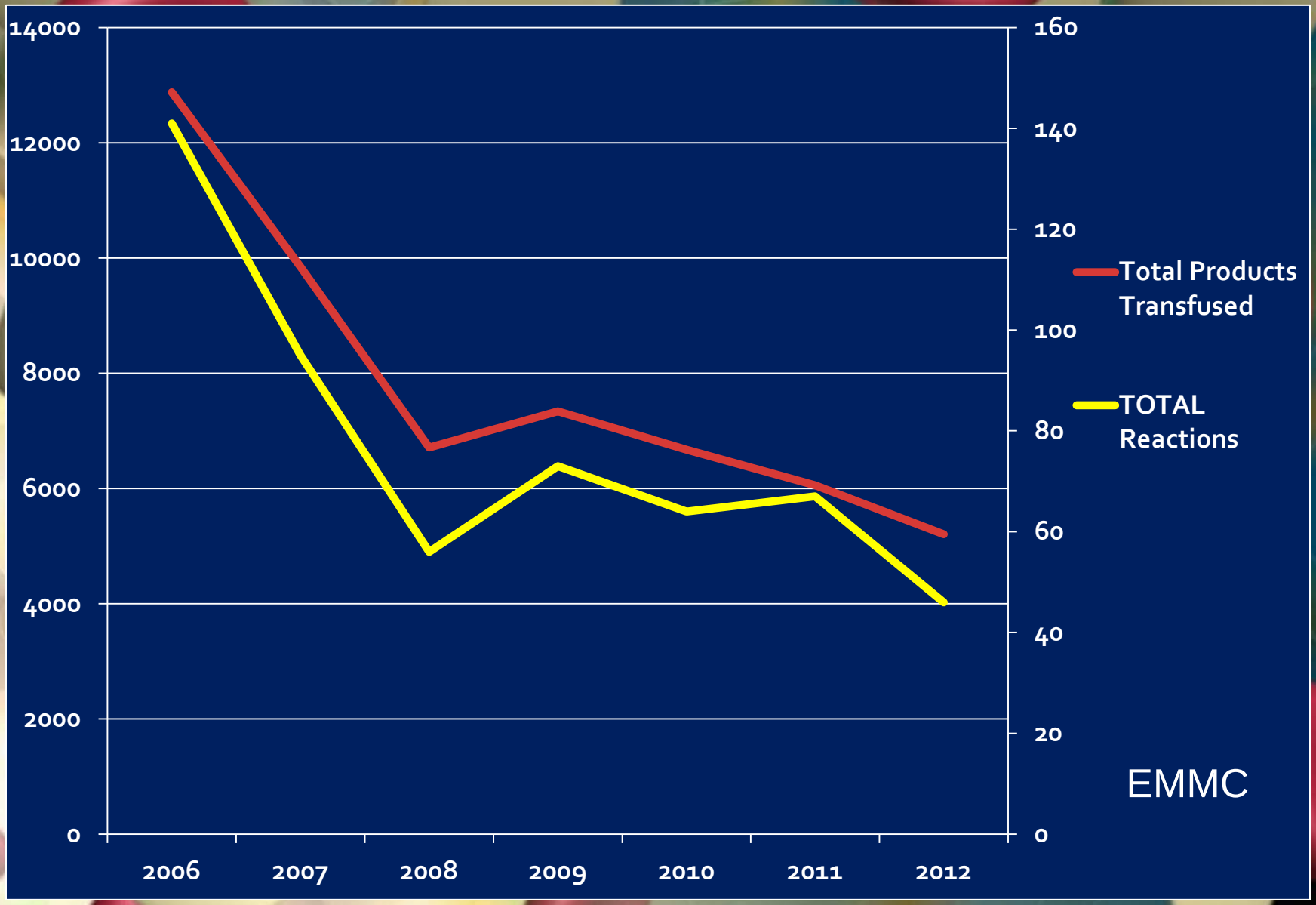
US ALLOGENEIC RBC TRANSFUSIONS FROM NBCUS DATA

Millions of Units Transfused



Affects of Bld Mgmt?

Total Transfusion Reactions vs. Total Products Transfused



The "Stephen's Report"

March 2001

Review of the Australian Blood Banking and Plasma Product Sector

Stephen's Report

"Opportunities for significant public health and safety gains lie in the **better use** of blood and blood products and **alter** e safety and quality o y on national oducts will ***rely mor*** ude the ***adoption*** ***development, data collection, audit, and patient and staff education."***

- *Data*
- *Policies*
- *Programs*
- *Education*
- *Patient engagement*

The National Blood Authority

Although it has taken time the establishment of the NBA with the endorsement of all Australian governments has created a focus for activity in the Australian blood sector that is now playing out to the advantage of implementing comprehensive

Patient Blood Management

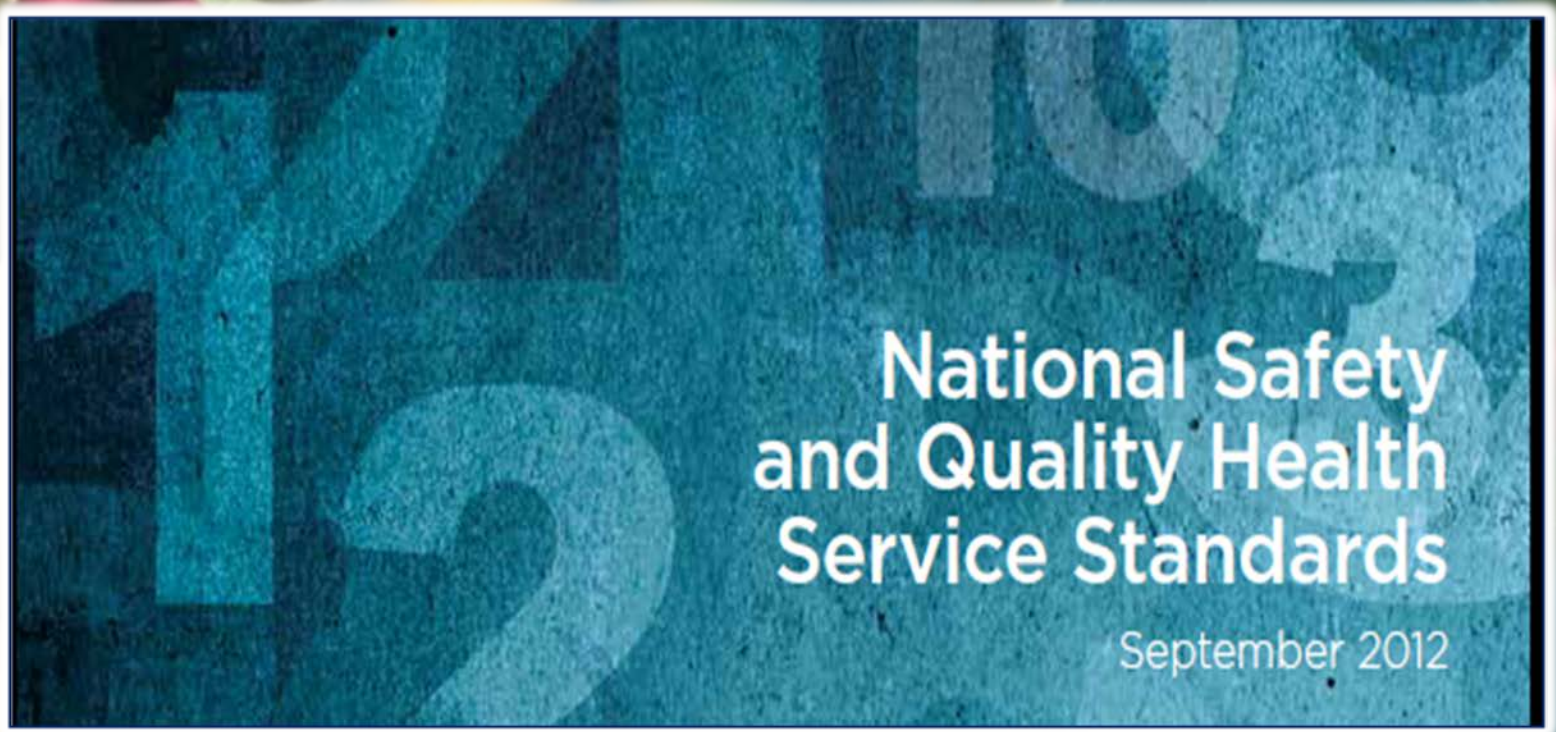
THERE is a FOCAL POINT for CHANGE!

National Stewardship Statement

All governments are committed to -

- **Providing an adequate, safe, secure and affordable supply of blood products, blood related products and blood related services; and**
- **Promoting safe, high quality management and use of blood products, blood related products and blood services in Australia.**

Australian Commission for Safety and Quality in Healthcare



Australian Commission for Safety and Quality in Healthcare

The principles **of good patient blood management** that provide for **clinically appropriate and safe management of patients** while avoiding blood and blood product transfusions and its associated risks **are supported by this Standard**.

National and international research demonstrates **that the dual approach of *implementing governance structures*** and ***evidence-based guidelines*** **is the most effective methodology to ensure the appropriate and safe use of blood and blood products**.

Communicating with patients and carers

Patients and carers are informed about the risks and benefits of using blood and blood products, and the available alternatives when a plan for treatment is developed.

Australian Commission for Safety and Quality in Healthcare

7.9.1
Patient information relating to blood and blood products, including risks, benefits and alternatives, is available for distribution by the clinical workforce

The Blood and Blood Products Standard:

7.11
Informed consent is undertaken and documented for all transfusions of blood or blood products in accordance with the informed consent policy of the health service organisation

and the available alternatives when a plan for treatment is developed.

NBA Annual Report 2012-13

Mr Leigh McJAMES
CEO NBA

Annual Report 2012-13

The role of the NBA is to ensure an adequate, safe, secure and affordable supply of blood and blood related products. The NBA delivered significant outcomes against this fundamental responsibility. The best indicator of this is the delivery of improved performance levels at a significant saving against the supply budget of $85.7 million for 2013-13.

Mr Leigh McJAMES CEO NBA

Annual Report 2012-13

A key contribu… *marked reduc…* *products* as a… appropriate u…

These improv… the implemen… and clinician …

Year	Red cell packs issued
2007-08	*768919*
2008-09	*793479*
2009-10	*795891*
2010-11	*800570*
2011-12	*801295*
2012-13	*763541*

Welcome to Australia's first two day Patient Blood Management Conference

Patient Blood Management As A Australia: Past, Present And Future

Thanks for listening

20, 21 June 2014
Perth Convention Centre
Perth, WA