

SERIOUS HAZARDS OF TRANSFUSION

SHOT

Recurring Errors in Transfusion and Human Factors

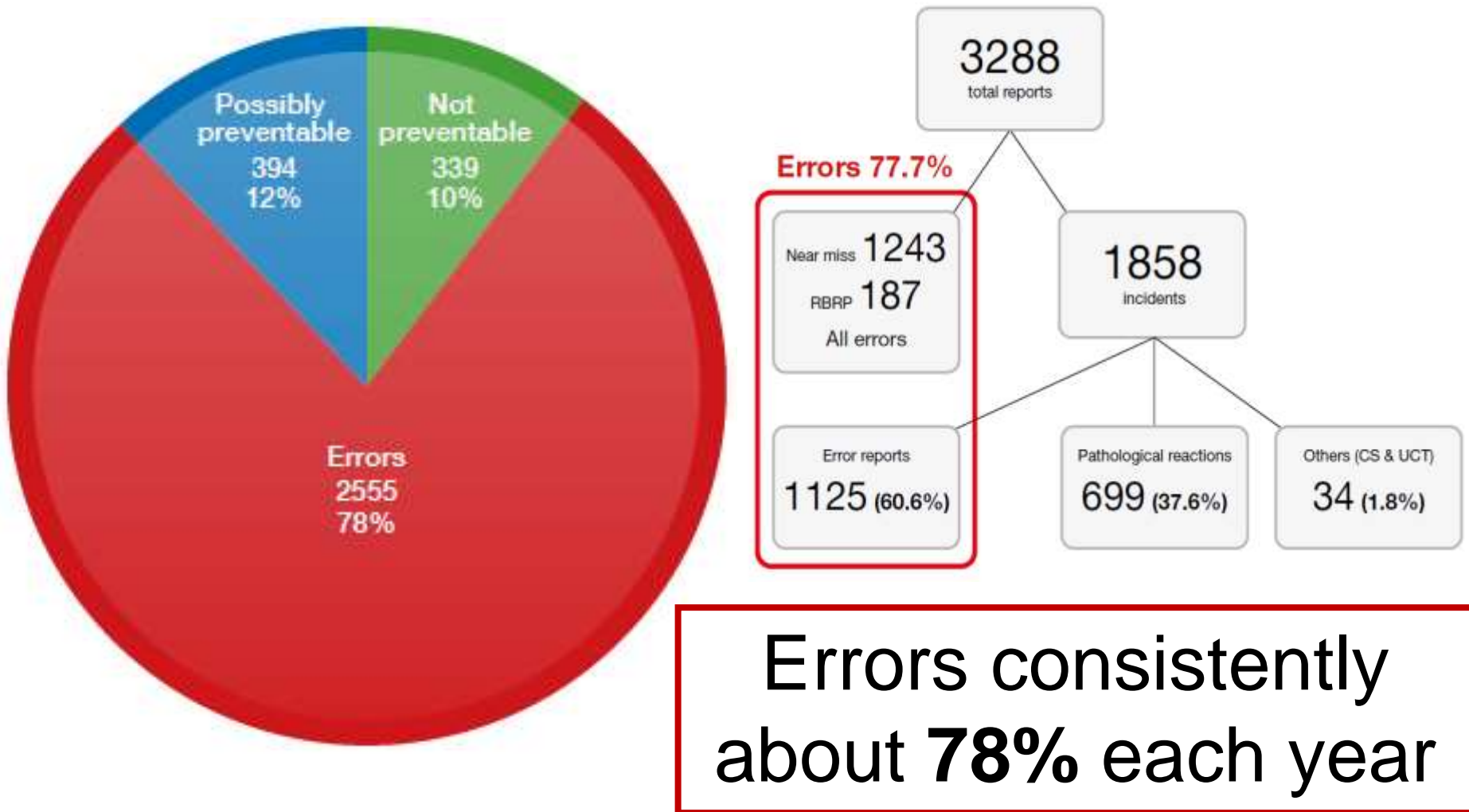
Sheffield Lab Matters – 22nd June 2017

Hema Mistry– Laboratory incidents specialist

SHOT recommendations

- But some recommendations have been repeated many times – **almost 50% recommendations are repeats**
- Many have been actioned:
 - SHOT contributed to 14 different British Committee for Standards in Haematology (BCSH) guidelines
 - Changes to Blood Service practices = reduced TRALI & bacterial infection
 - Transfusion training and competency assessments
 - Widespread appointment of transfusion practitioners
 - Patient blood management

SHOT Reports 2015 n=3288



Errors consistently
about **78%** each year

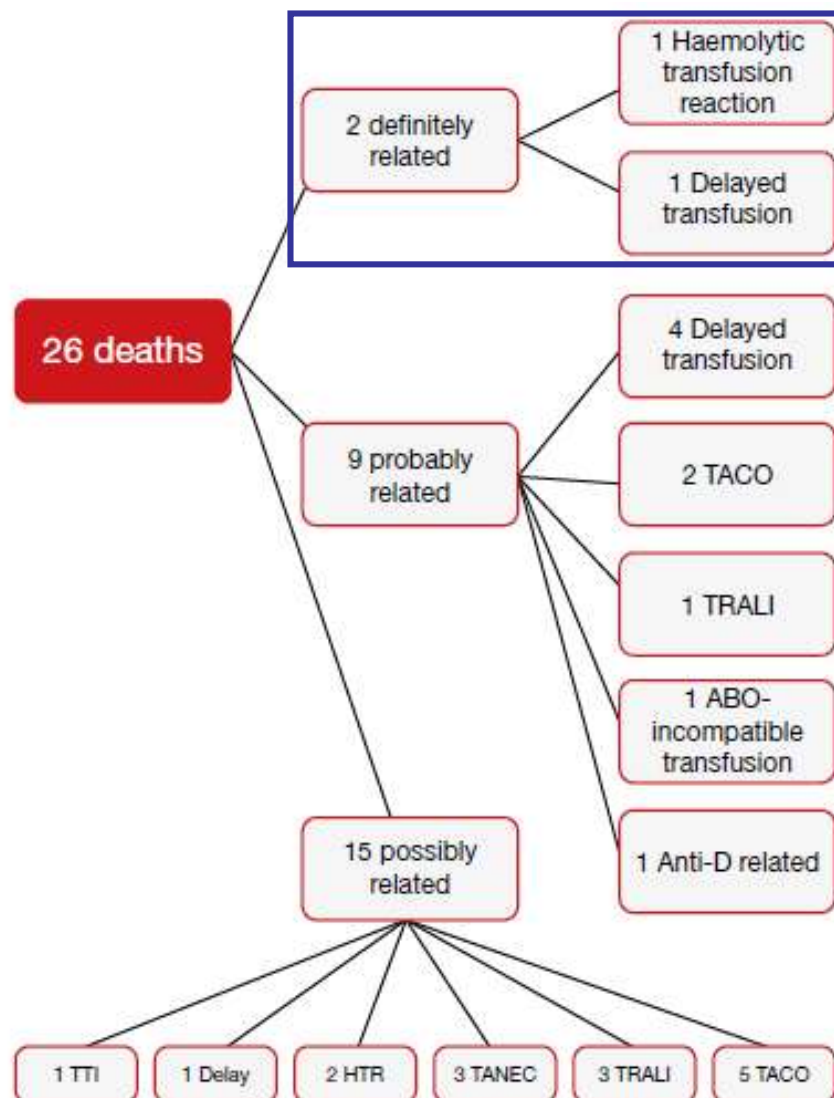
Recurring error themes to be considered

1. Delays, especially in emergency situations
2. Multiple errors
3. Near miss incidents
4. Patient identification failures
5. TACO is biggest cause of death
6. IT systems are not infallible

**Can understanding Human Factors
reduce errors?**

1. Delays, especially in emergency situations

Deaths & Major Morbidity



Death – Delayed transfusion

- An elderly woman was admitted for elective aortic aneurysm repair
- The aneurysm had been identified when she attended the emergency department (ED) with gastroenteritis
- She was transferred to another hospital where she was an inpatient for several days
- On admission for surgery a week later, blood samples were taken and 6 units of red cells crossmatched
- When the blood was required in theatre a discrepancy in the spelling of the patient's name was discovered (one letter was incorrect)
- The case notes and consent form had the wrong spelling but the blood was labelled correctly
- The units were returned to the transfusion laboratory according to the hospital protocol
- There was subsequently a delay in transfusion which contributed to her deterioration with development of coagulopathy and death later that night

How did this happen...?

- **Name correct on transfer letter but incorrectly entered onto patient information system**
- **Discovered prior to admission, the electronic patient records were updated but hard copy case notes was not**
- **Wristband correct on admission, but this was not accessible at surgery (under drapes) so blood checked against hardcopy notes**
- **Two samples sent to lab who advised delay of 45-50 mins for crossmatch units**
- **Surgical complications resulted in urgent transfusion, emergency O D negative were not available, delay**

2. Multiple errors

Critical points in the transfusion process

**Critical points:
Positive patient
identification essential**

1 REQUEST

2* SAMPLE

3 SAMPLE RECEIPT

4 TESTING

5 COMPONENT SELECTION

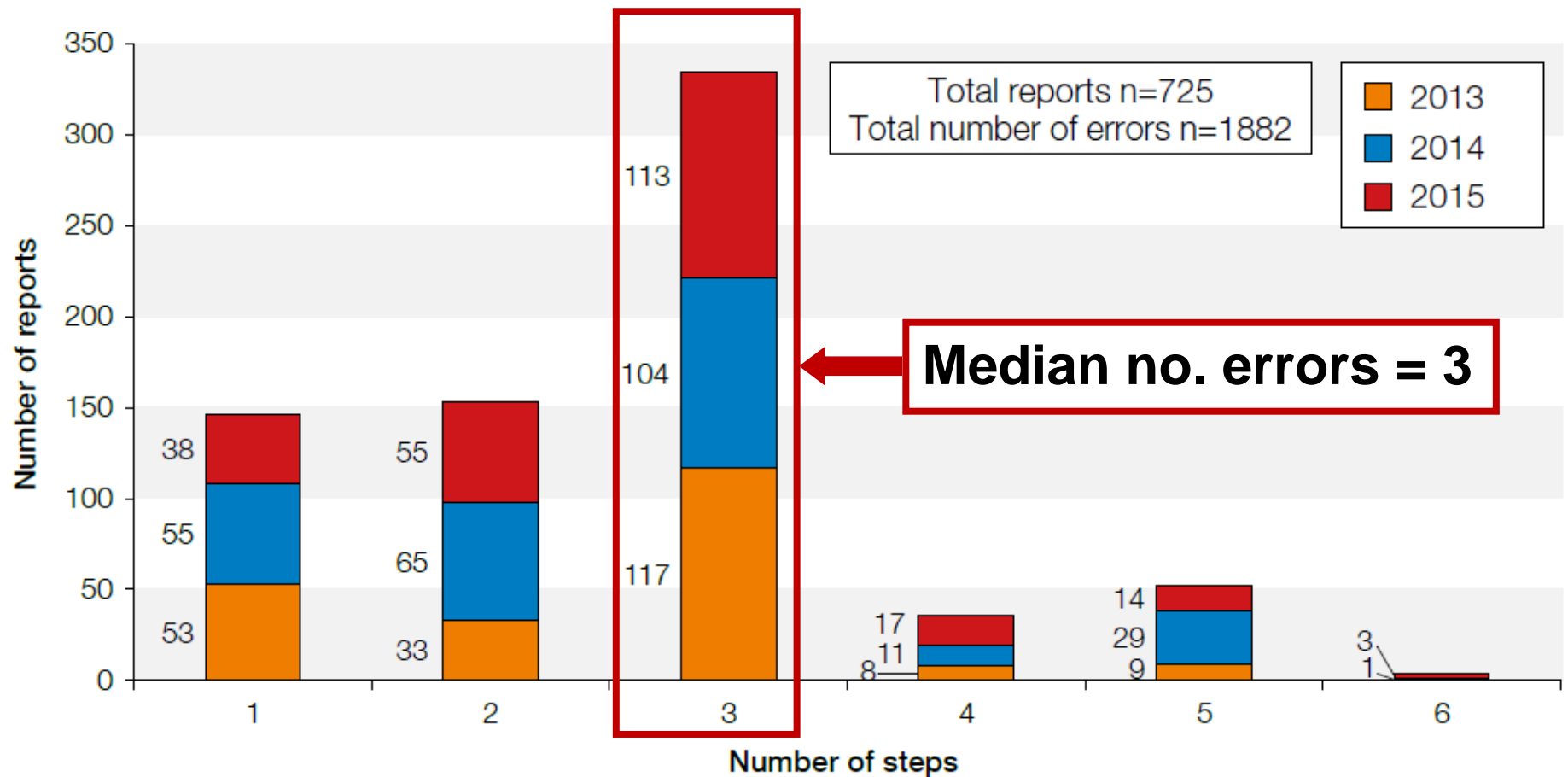
6 LABELLING

7 COLLECTION

8 PRESCRIPTION

9* ADMINISTRATION

Multiple errors 2013-2015



Multiple missed opportunities to detect the primary error

ABO incompatible transfusion despite a robust system of warning alerts on the LIMS

- The lab received a sample on the 14th Nov for a transfusion scheduled for the 16th Nov
- The sample was tested and reported as O RhD pos
- The BMS selected and issued 2 units of red cells, group A RhD pos
Error 1 – component selection
- A warning flag alerting the BMS to the incompatibility was overridden on several occasions
Error 2 – component labelling
- Another BMS labelled the units prior to putting them in the issue refrigerator
Error 3 – final bedsidecheck/administration
- Nurses did not question the discrepancy between the patient blood group and pack group of the unit during the bedside check
- Patient developed acute and delayed haemolysis, no long term sequelae

Multiple Errors across healthcare

Death from septicaemia
after catalogue of errors

Monday December 28 2015 | THE TIMES

**1,000 deaths blamed
on errors by A&E staff**



BMJ 2016;353:j2139 doi: 10.1136/bmj.j2139 (Published 3 May 2016)

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ANALYSIS



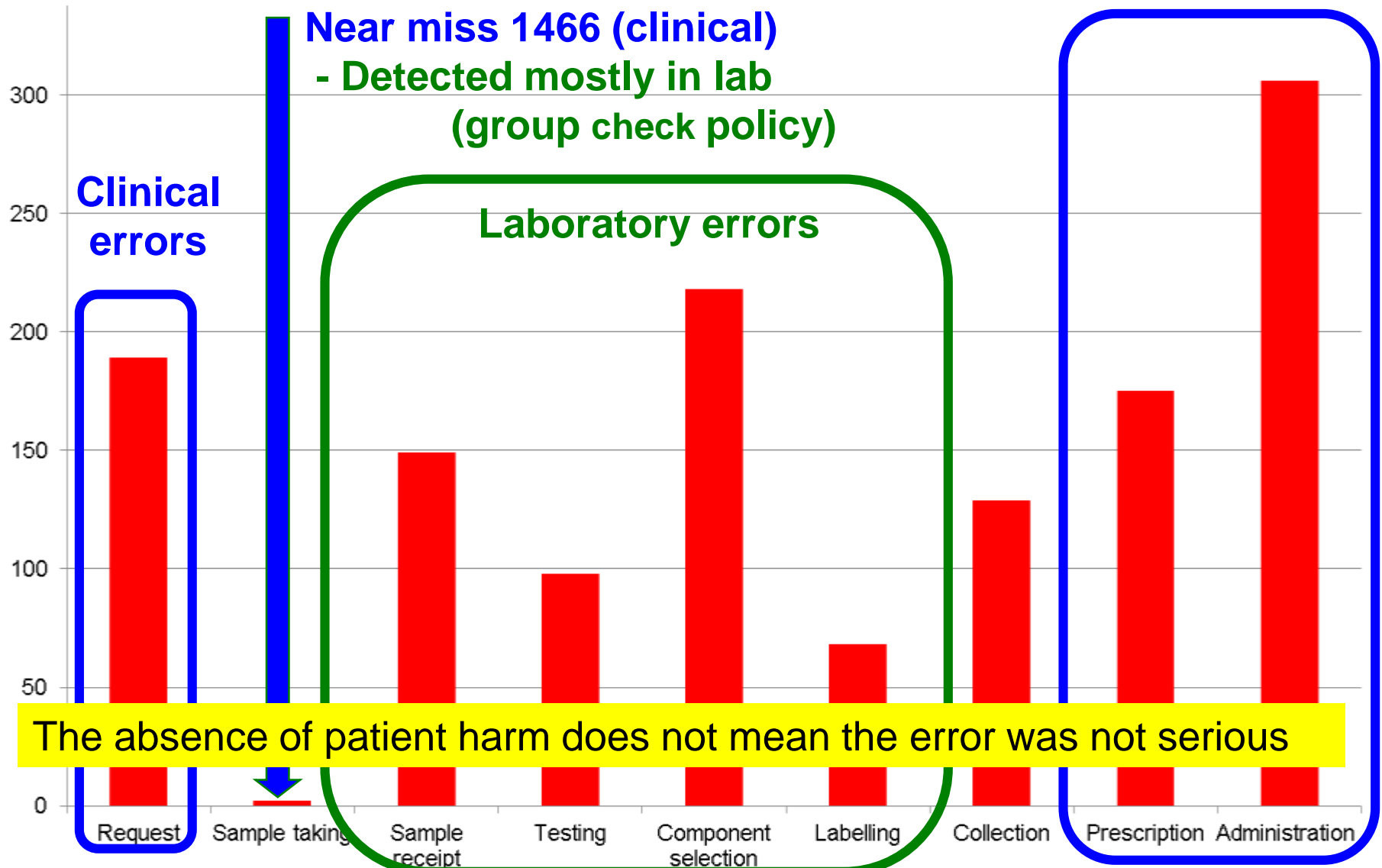
Medical error—the third leading cause of death in the US

Medical error is not included on death certificates or in rankings of cause of death. Martin Makary and Michael Daniel assess its contribution to mortality and call for better reporting

Martin A Makary *professor*, Michael Daniel *research fellow*

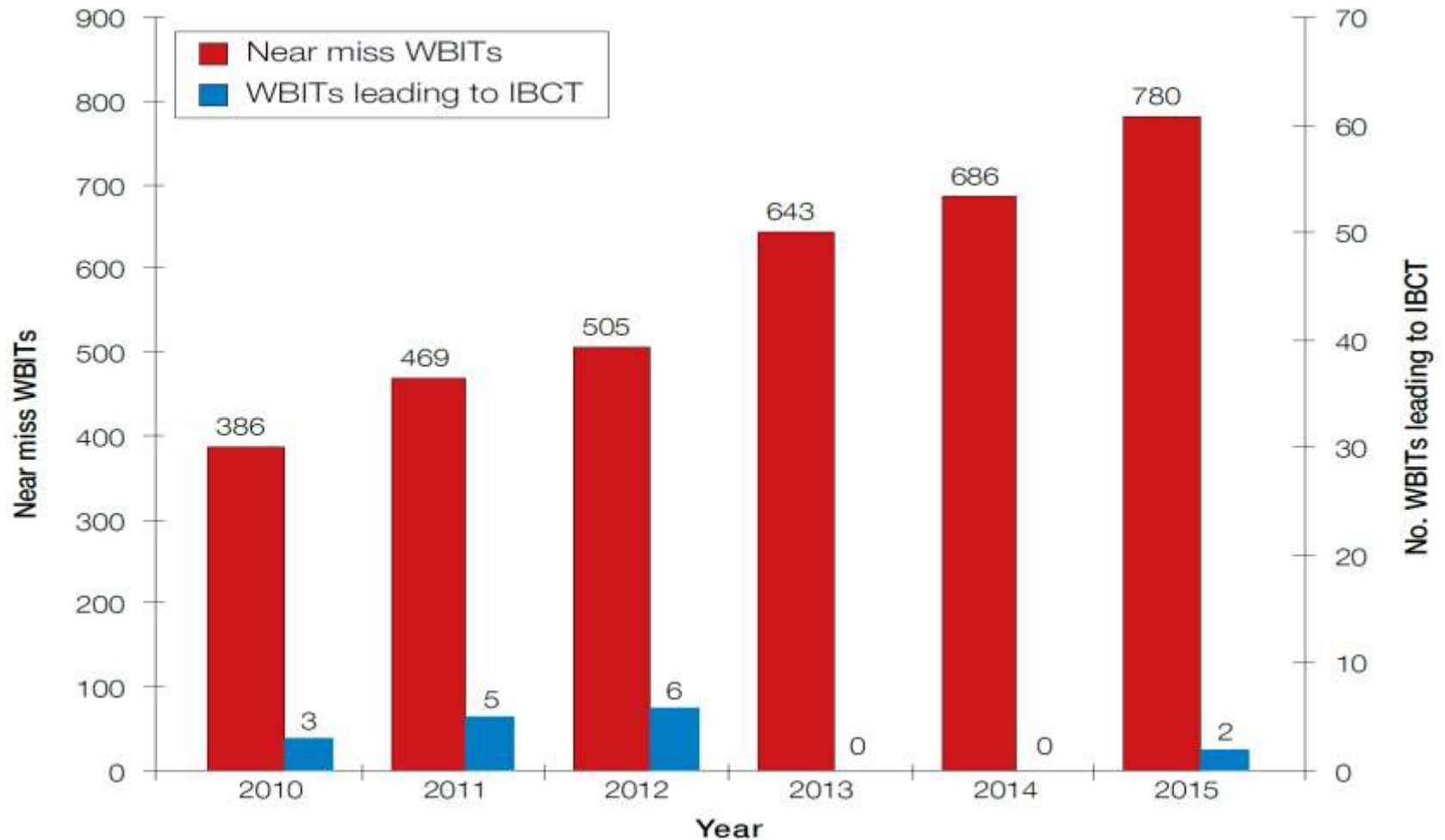
Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, MD 21287, USA

Wrong transfusions 2014 & 2015



3. Near miss incidents

WBITs = failure of patient id



4. Patient identification failures

POSITIVE patient identification

Can you please tell me your full name, date of birth and the first line of your address

Always check the patient ID band to confirm patient details

SHOT checklist recommendation

- Original suggestion made in 2013 Annual SHOT Report
- SHOT example included in 2015 Annual SHOT Report

SERIOUS HAZARDS OF TRANSFUSION

SHOT

Human factors in hospital practice
Be safe! Use the bedside checklist

☒

Positive patient identification
- ask the patient to state name and date of birth

☒

Check identification of component against patient wristband

☒


Check the prescription
- has this component been prescribed?

☒

Check the prescription
- is this the correct component?


☒

Check for specific requirements
- does the patient need irradiated components or specially selected units?



- Other checklists available - choose best option locally

RTC checklist


Blood and Transplant

Blood Transfusion Bedside Checklist

Before each unit of blood is transfused, ensure you:

1) Check for blood component integrity
- No clots, leaks, damage, discolouration or expiry

2) Check informed consent is documented
- Reason & risk/benefits explained? Alternatives? Information given?

3) Confirm Positive Patient Identification (PPID)
- Ask your patient to tell you their full name and DOB

4) Check unit tag against unit label, prescription, patient ID band and PPID
- Are there any specific transfusion requirements?

5) Perform Observations
- Baseline, after 15 minutes, end of transfusion & as per local policy

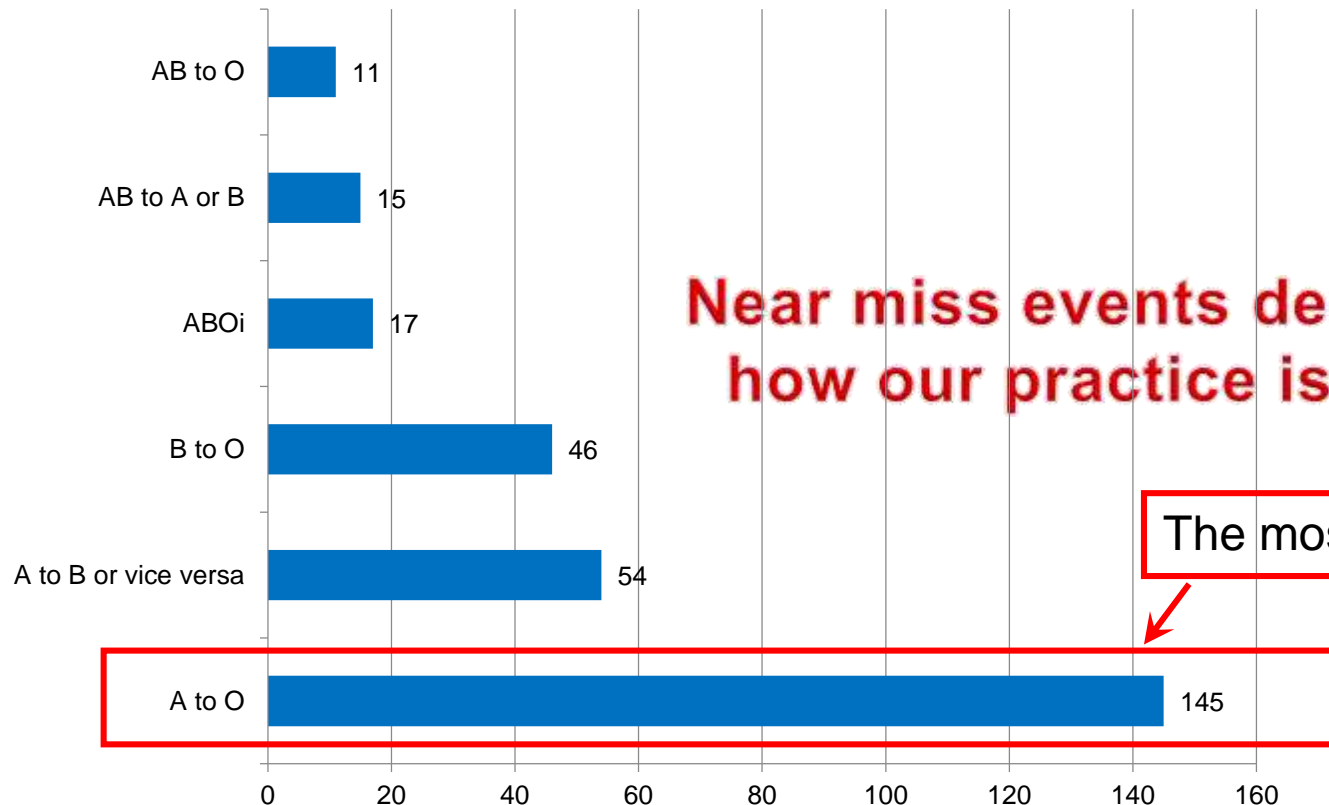
Now you may set-up your safe transfusion

Near miss incidents – potential outcomes

Total 288 possible ABO-incompatible transfusions

Cumulative SHOT data show that about 33.3% of ABO-incompatible red cell transfusions cause death or serious harm

So a third, 96/288, of patients potentially harmed



Near miss events demonstrate
how our practice is not safe

The most dangerous

ABO Errors

7

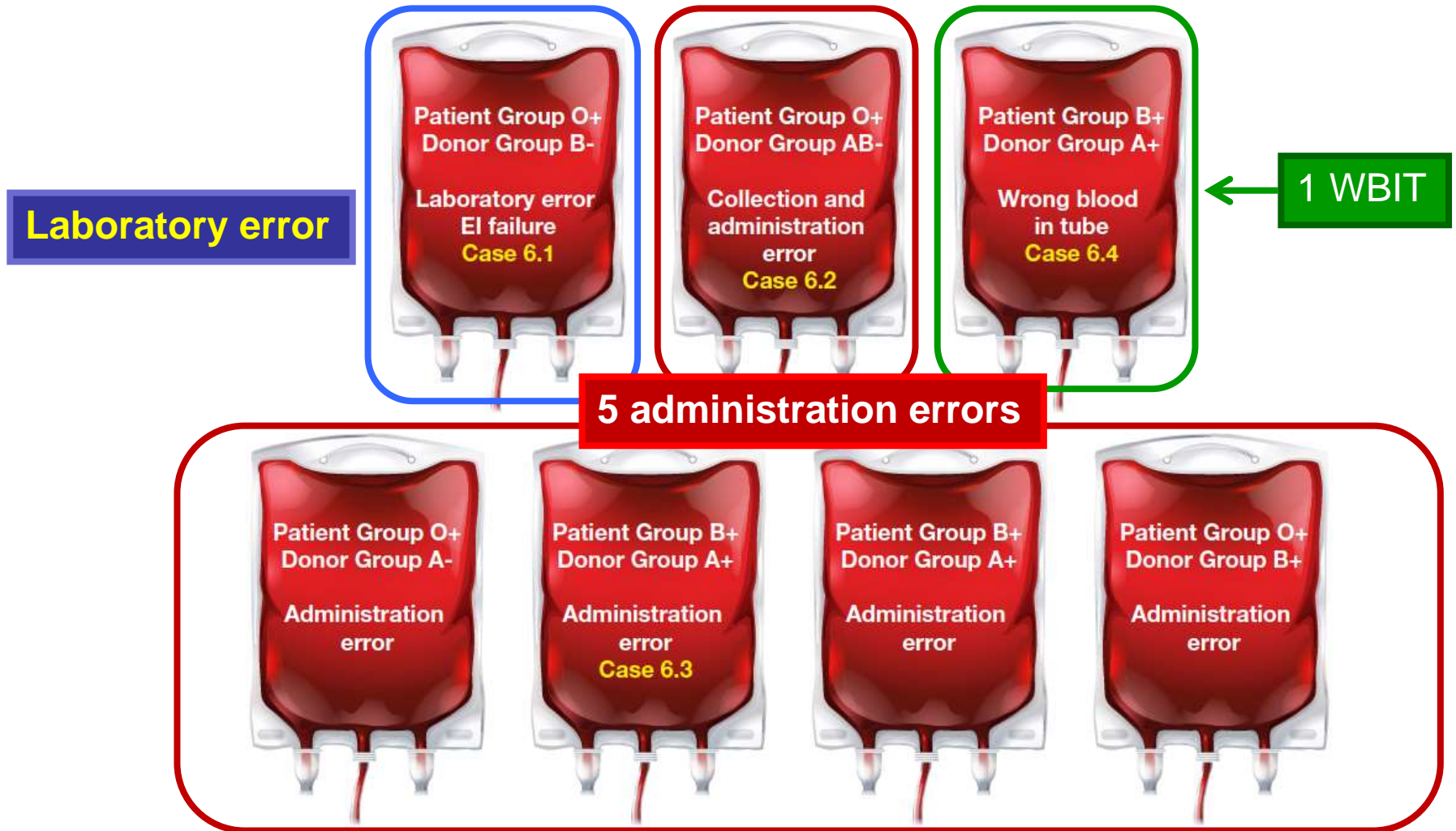
ABO-incompatible
transfusions and
6 more to stem cell
transplant patients



**But 288
additional
near miss
ABO-events**



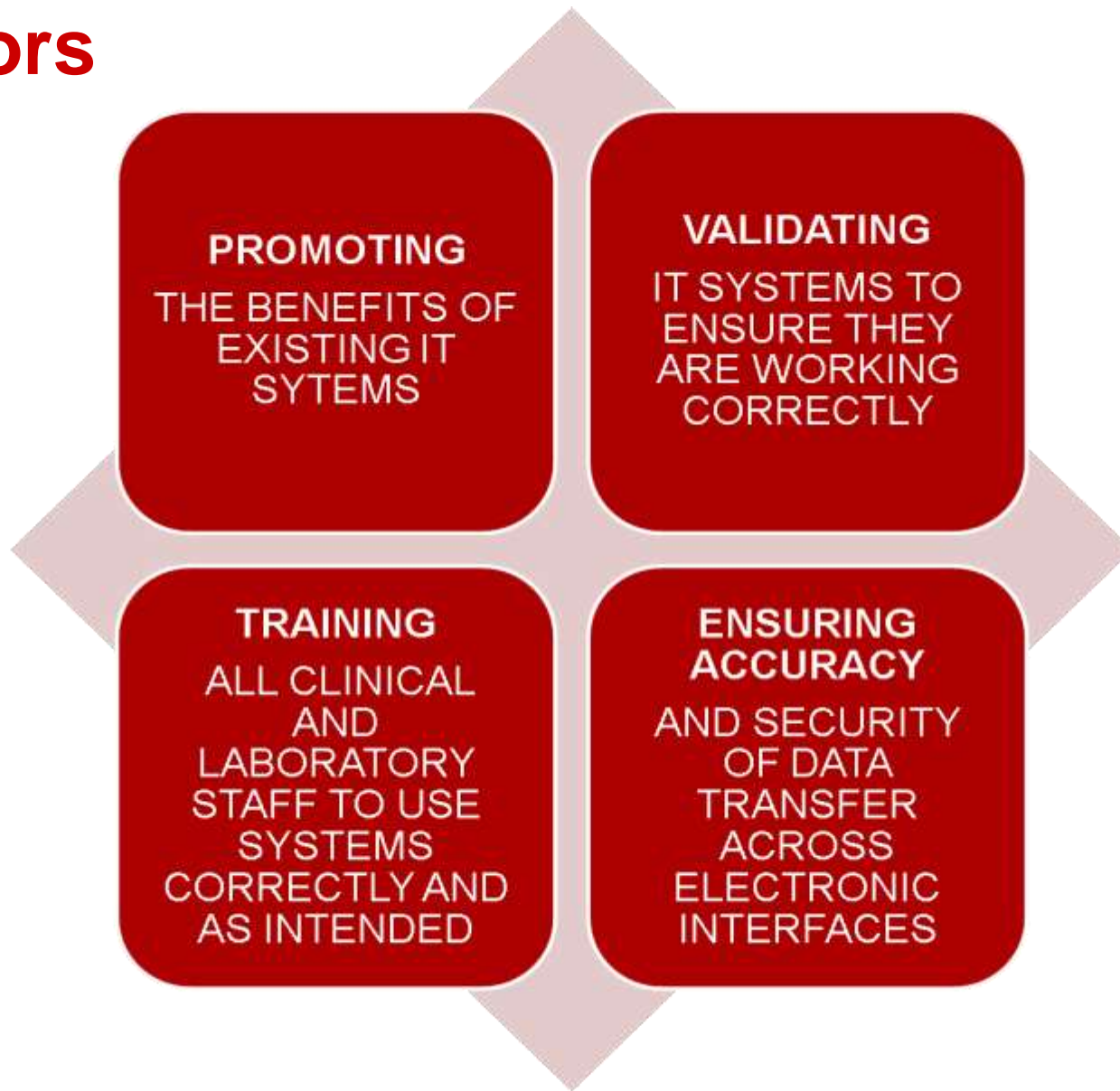
ABO incompatible red cell transfusions n=7



ABO-incompatible transfusion permitted by an electronic issue system which was not fit for purpose as it had not been validated

- A 29 year old male in sickle crisis required transfusion of 3 units of red cells
- The patient was known to be group O D-positive with no alloantibodies
- The BMS selected 3 group B D-negative red cell units in error and proceeded to issue these electronically via the LIMS
- Warnings stating the ABO discrepancy were displayed, but were overridden by the BMS by pressing a function key, because there was no requirement to enter text such as 'yes proceed'
- During transfusion of the first unit, the patient felt unwell and transfusion was stopped
- The unit was returned to the laboratory but rather than initiating an investigation, the unit was placed in quarantine until the day staff came on duty when the ABO discrepancy was noticed
- Overnight, 2 further ABO-incompatible units were transfused to the patient

IT errors

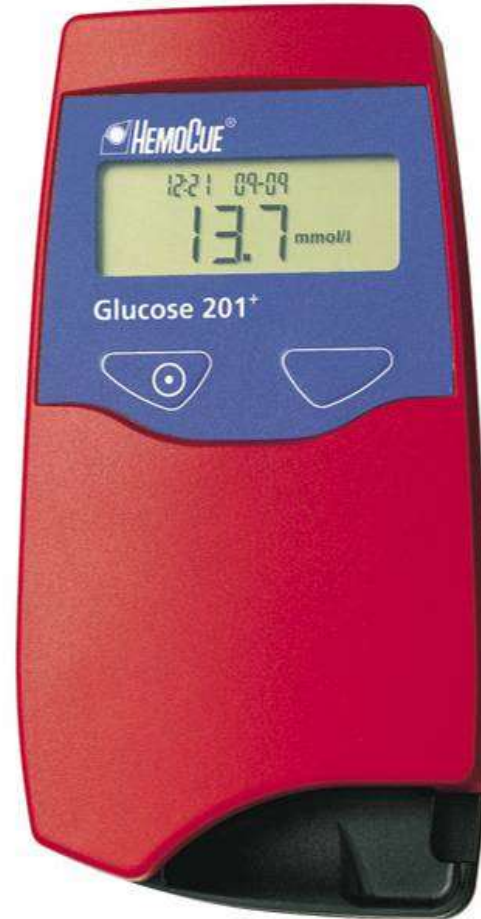
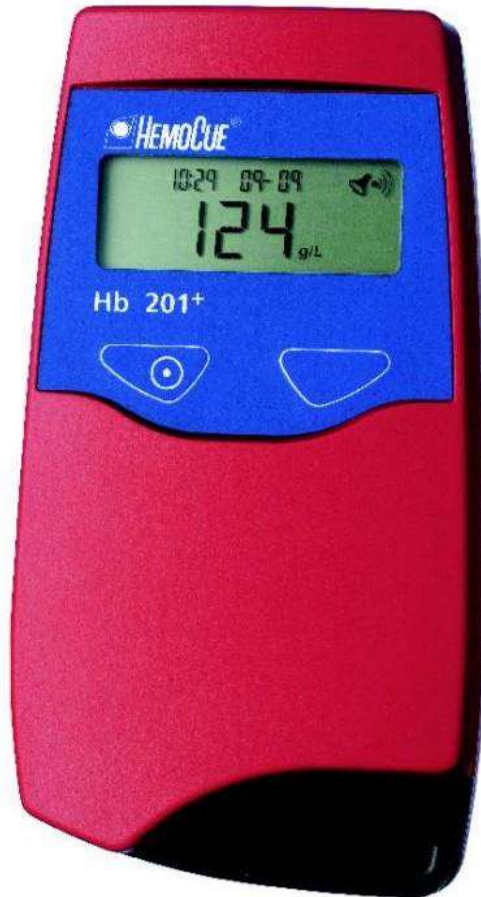


Can an understanding of Human Factors reduce errors?

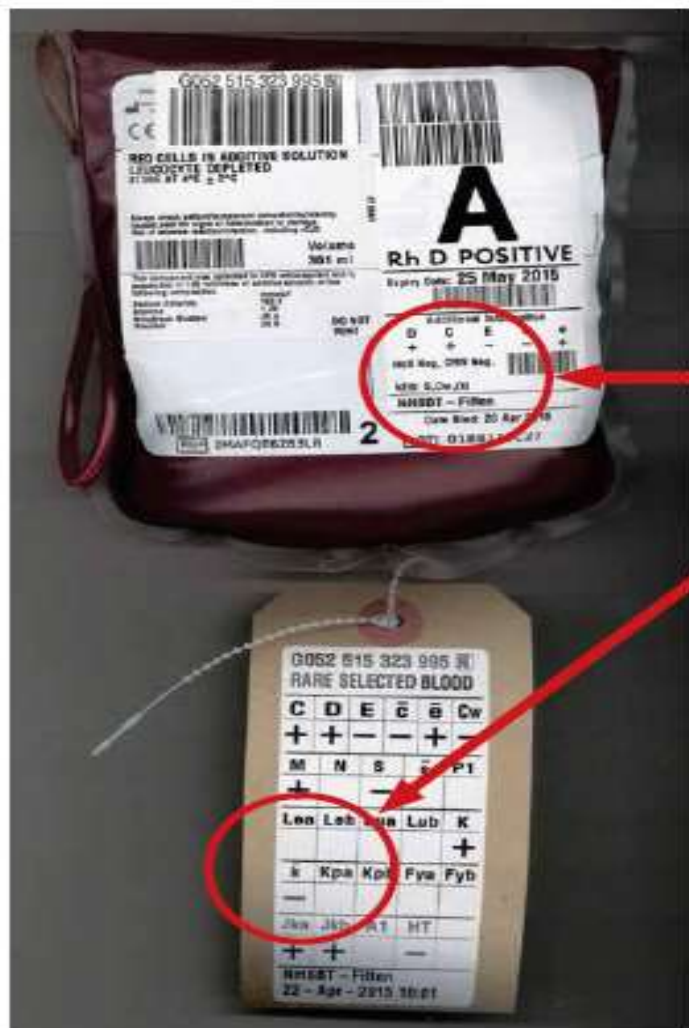
Being set up to fail...

...an accident waiting to happen

Errors have been made in theatre with point-of-care testing



Double & confusing nomenclature for k (Cellano)



(k) on the bag

Two different nomenclatures used for the k antigen (little k, formerly known as Cellano):

NEG:...(k) in the upper label, but \bar{k} in lower panel

\bar{k} on the label attached to the bag

What is Human Factors (HF)?

- The term 'Human Factors' relates to how a human interacts with processes, systems, equipment and the environment
- It is equivalent to the term ergonomics
- It should not be mistaken for being only about factors relating to the human themselves, e.g. a badly designed system or piece of equipment could be categorised as human factors because it could lead to errors and incidents

HF page in SHOT Database (Dendrite)

Human Factors	
<p>As three quarters of all incidents reported to SHOT are related to mistakes, we would like to understand more about why these occur. Mistakes in medical practice may be related to workplace features. What are the human factors that contribute to errors in transfusion practice?</p> <p>For the questions below, please estimate on a scale of 0 to 10, where 0 is none and 10 is total cause.</p> <p>SHOT has recognised how difficult it can be for reporters to score the human factors aspects of an incident. Therefore, a short self-learning package has been prepared and published on the SHOT website. Please copy and paste this link < www.shotuk.org/human-factors-tuition-package/ > into your internet browser to access the tuition package. We suggest you may want to save this incident report if you are planning to read the package now.</p>	
Please indicate if you read the human factors self-learning tuition package this time	<input type="radio"/> Yes <input type="radio"/> No; but have read it previously <input type="radio"/> No
To what extent is the cause of this incident attributable to unsafe practice by individual staff member(s)	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10
Please give any additional relevant information	<div></div>
To what extent is the cause of this incident attributable to unsafe conditions associated with the local environment or workspace	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10
Please give any additional relevant information	<div></div>
To what extent is the cause of this incident attributable to unsafe conditions associated with the local environment or workspace	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10
Please give any additional relevant information	<div></div>
To what extent is the cause of this incident attributable to unsafe conditions associated with organisational or management issues in your Trust/Health Board (E.g. staffing levels)	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10
Please give any additional relevant information	<div></div>
To what extent is the cause of this incident attributable to unsafe conditions associated with the Government, Department of Health or high level regulatory issues (i.e. the error was caused by regulatory issues, not reportable as a regulatory failure)	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10
Please give any additional relevant information	<div></div>

Organisational and Government factors are hard to score

It is clear that reporters struggle to assign scores the farther away it gets from the individual and the actual incident. This is not surprising as these are difficult factors to assess.

The discussion points in the following case studies may give some ideas for factors to consider that are outside the control of the individual or their local managers.

In particular it may be worth considering if outside factors could result in staff failing to follow policies.

Case 1: Total cause of incident initially attributed to individual

- Patient A had a pre-transfusion sample taken by a nurse in a side room of the ward
- The nurse was also co-ordinating the ward beds and labelled the sample away from the bedside, while dealing with a query from another member of staff about patient B
- The nurse labelled the sample and request form with patient B's details instead of patient A
- Patient B had a historical blood group result, so the ABO mismatch was detected by the laboratory testing
- The nurse then realised her error and repeated the sampling of patient A
- There was a slight delay in ordering blood for patient A, but no major harm was caused

Case 1 - Human factors scores initially given

Cause attributable to unsafe practice/conditions associated with:	Score out of 10
Individual staff member(s)	10
The local environment or workspace	0
Organisational or management issues in the Trust/Health Board?	0
Government, Department of Health or high level regulatory issues	0

Case 1 - Discussion

- This case was originally scored with 10 for the **individual staff** member and nothing for any other human factors
- However, the **local environment or workspace** was not ideal, because the nurse was working in a side room, whilst also being responsible for coordination of all ward beds
- If there were not appropriate systems and policies in place, that would be an **organisational issue**, e.g.
 - A member of staff involved in the critical task of taking pre-transfusion samples should not be disturbed by another staff member
 - A patient's request form should be available in advance of taking a sample, so the details can be cross-checked during the sampling process, but on this occasion that was not done
 - Does that mean there were no systems or policies in place to cover these items? Or if staff did not comply with policies because of an excessive workload that would be another organisational factor
- If the excessive workload was caused by poor staffing levels, that could be a **Department of Health level issue**, because of government underfunding of the health service

Case 1- HF scores when further info considered

* The suggested scores assume all discussion points are valid, but the local investigator may know more detail and might score differently

Additional information case study 1	Initial score	Suggested score *
Individual staff member(s): <ul style="list-style-type: none">• request form should be available, but ?no policy• sample must be labelled at the bedside	10	5
The local environment or workspace: <ul style="list-style-type: none">• working in a side room, possibly away from resources• while also being responsible for all ward beds• interrupted by colleague when doing a critical task	0	7
Organisational issues: <ul style="list-style-type: none">• ? no policies about request form, interruption etc.• ? poor compliance, due to excessive workload	0	6
Government, DH or high level issues: <ul style="list-style-type: none">• ? excessive workload caused by poor staffing levels as a result of government underfunding	0	4

Summary

- Human factors is all about how humans interact with processes and systems
- It is common to think the individual is totally responsible for an error, but they may be working in a poor system
- Our top tip is to review all contributing factors before scoring the human factors section in the SHOT Database questionnaires
- If in doubt, please ask the SHOT Office, SHOT@nhsbt.nhs.uk, 0161 423 4208

Acknowledgements

- **SHOT Team in Manchester**
- **SHOT Working and Writing Expert Group**
- **SHOT Steering Group**
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