Transfusion Reactions
SHOT Annual Report 2010
Hazards of Transfusion
Over & Under Transfusion

The Technical & Advisory Discussion Group (TADG)

& The South East Coast RTC Education Day

“Have you got the TX Factor?”

27 January 2012

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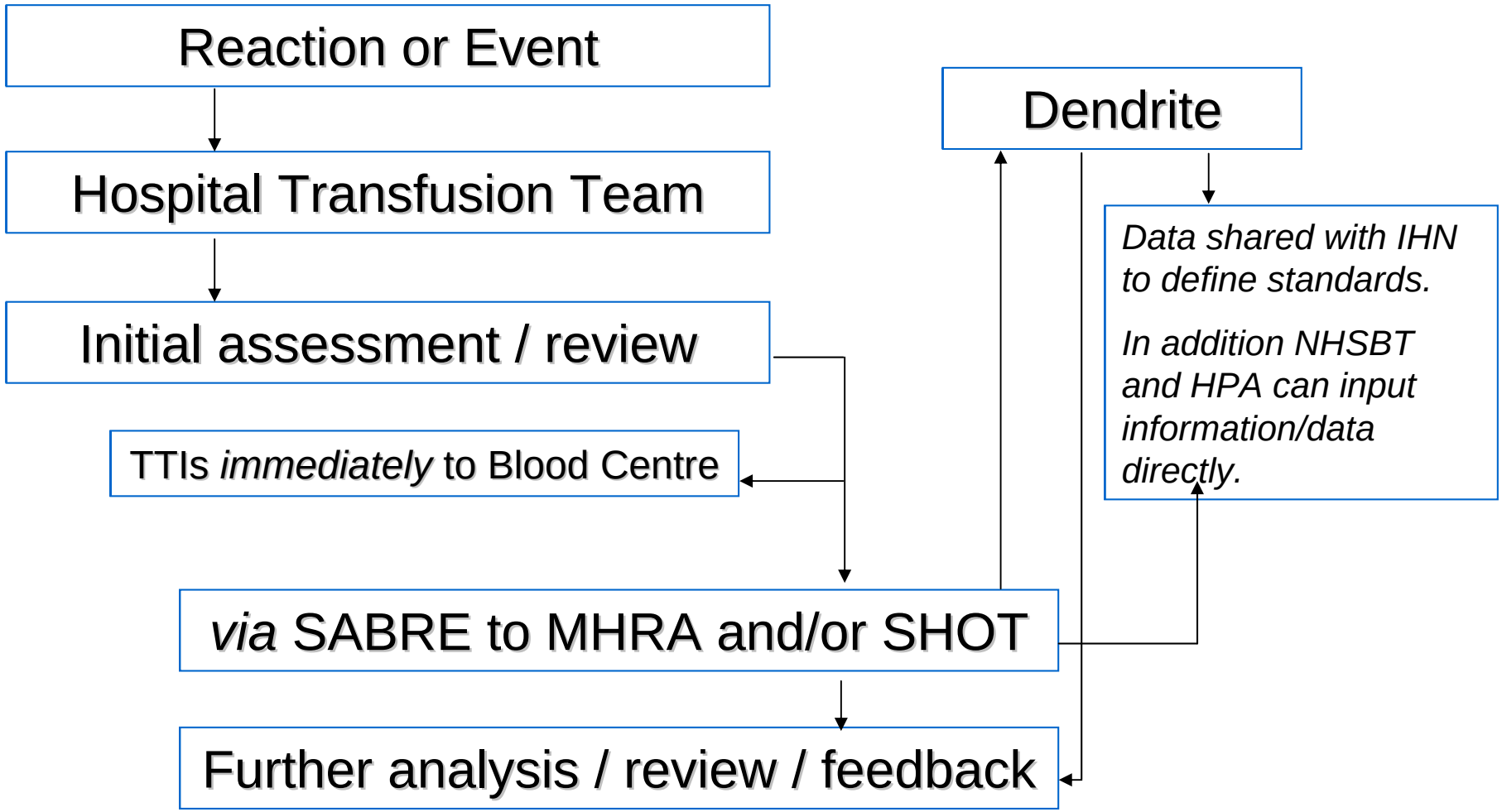
SHOT Mission Statement

To improve patient safety in blood transfusion practice

Aims of SHOT

- Improve standards of hospital transfusion practice
- Educate users on transfusion hazards and their prevention
- Aid production of clinical guidelines
- Inform policy within the UK Blood Services
- Inform national policy on transfusion safety within the UK
- Inform Europe about transfusion safety in the UK

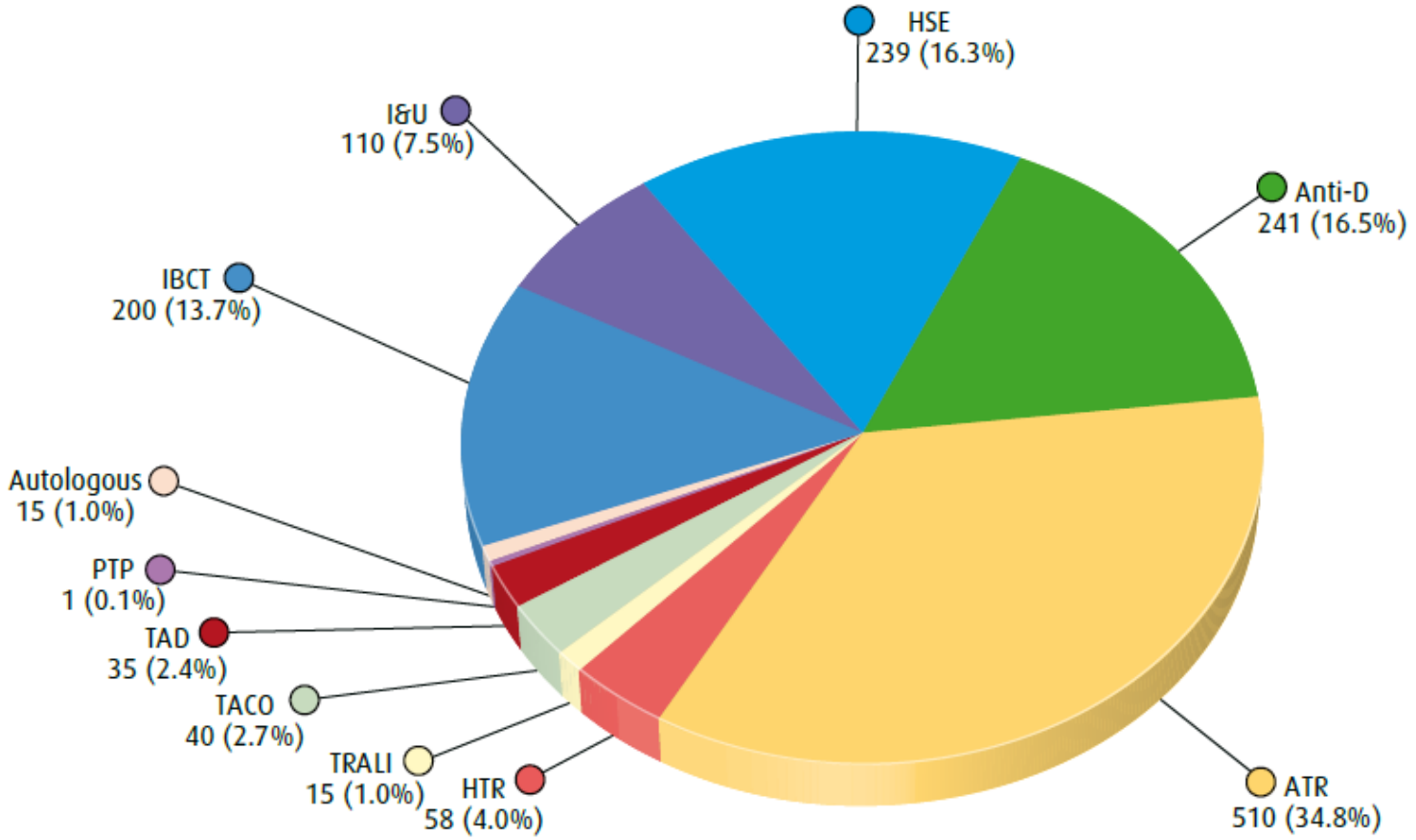
Procedure for Reporting



SHOT Categories of Tx Hazards

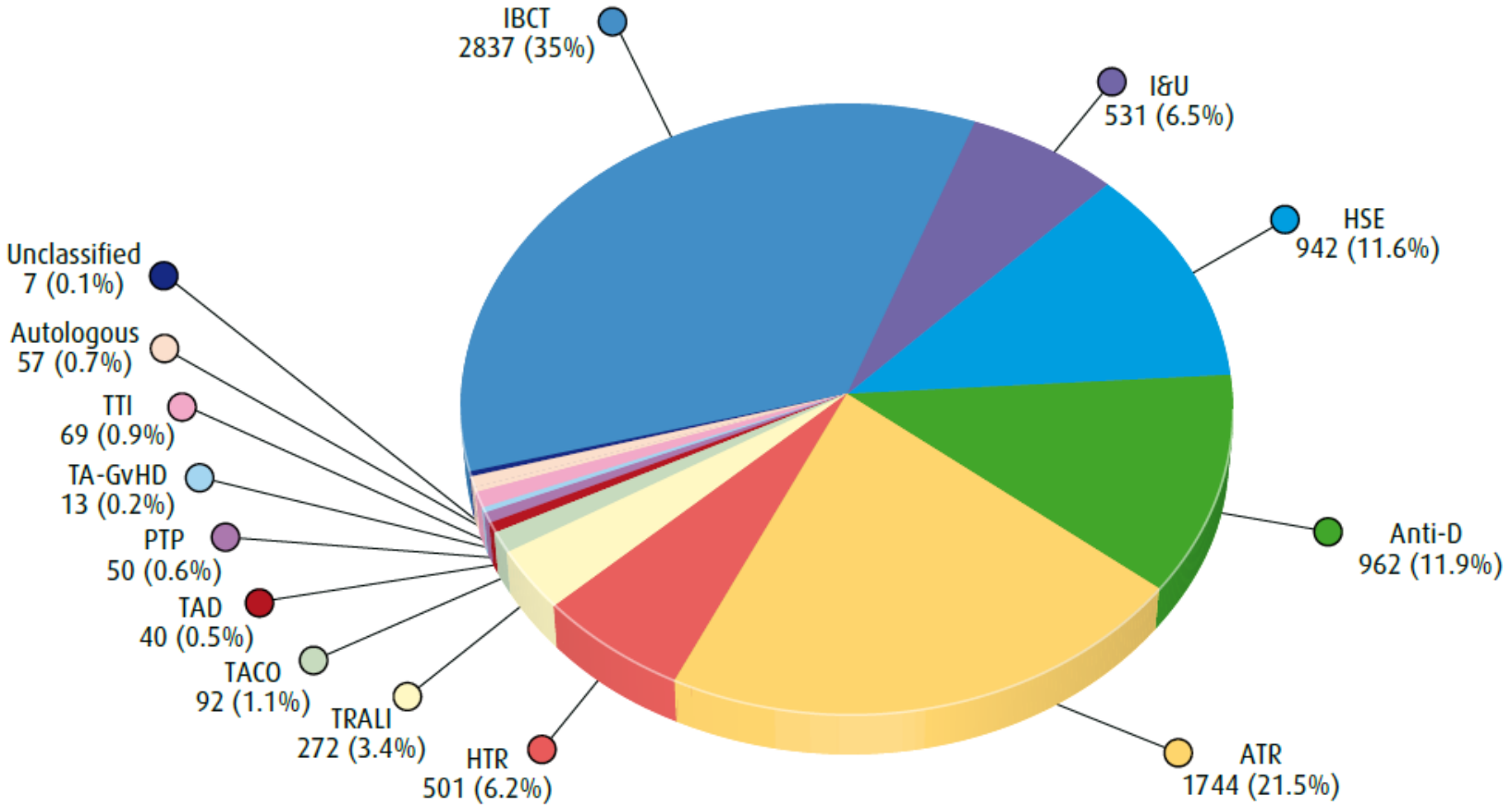
- **IBCT - Incorrect blood component transfused**
  - **SRNM** (Special Requirements Not Met)
  - **RBRP** (Right Blood Right Patient)
- **I&U - Inappropriate, Unnecessary, Under/Delayed Transfusions**
- **HSE - Handling & Storage**
- **Anti-D Ig**
- **ATR - Acute transfusion reactions**
- **HTR - Haemolytic transfusion reactions**
- **Near-miss events**
- **TRALI - Transfusion-related acute lung injury**
- **TACO - Transfusion Associated Circulatory Overload**
- **TAD - Transfusion Associated Dyspnoea**
- **PTP - Post-transfusion purpura**
- **TA-GVHD - Transfusion-associated graft-versus-host-disease**
- **TTI - Transfusion transmitted infections including bacterial contamination**
- **Autologous (cell salvage)**

Reports 2010 *n=1464*



* Chart excludes NM(863) & RBRP (137).

Cumulative reports 1996-2010 *n=8117*



* Chart excludes NM & RBRP.

2010 - What's good

- There were **no** cases of transfusion transmitted infection (TTI)
- 29% overall reduction in IBCT reports

  (*57% clinical & 28% laboratory)*
- Participation increased

  (only 22% in 1996, now 94.7% in 2010)

2010 - What's bad

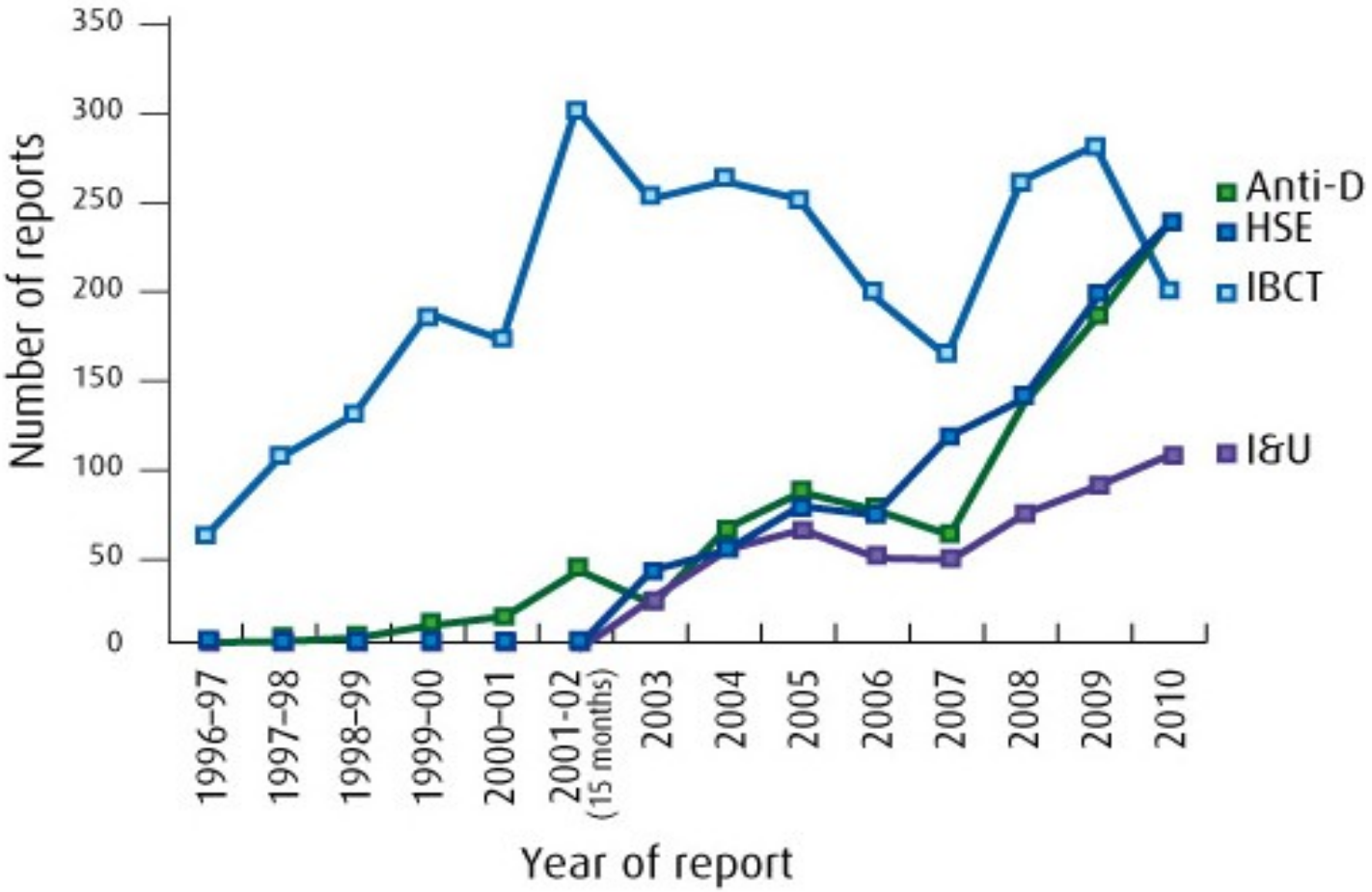
- 13 transfusion-related deaths, 7 due to TACO
  - 3 at imputability 3
    - *Sudden unexpected death ATR*
    - *TACO*
    - *Hyperhaemolysis in child with SCD*
  - Remainder
    - *6 due to TACO*
    - *1 under-transfusion*
    - *2 ATR*
    - *1 TRALI in patient with massive GI bleed who died the same day of cardiorespiratory failure. No serology.*
- 101 cases of Major Morbidity

Hospital Laboratory Risks

- **Wrong Blood (leading to IBCT)**
  - ABO/Rh grouping errors
  - Incorrect component selection, including SRNM
  - Wrong blood for stem cell transplant patients
- **Pre-Transfusion errors (leading to IBCT, I&U)**
  - Procedural: unsuitable samples/historical records/incomplete testing
  - Testing: errors during crossmatch/interpretation/transcription error

    Examples of errors
    - Transposed samples
    - Wrong result from test
    - Incorrect interpretation of result
    - Transcription error of results (reduced risk with IT)
    - Problems exacerbated where no historical group available
- **HSE**
  - Equipment Failure
  - Transport/Delivery

Trends – avoidable errors (includes lab errors)

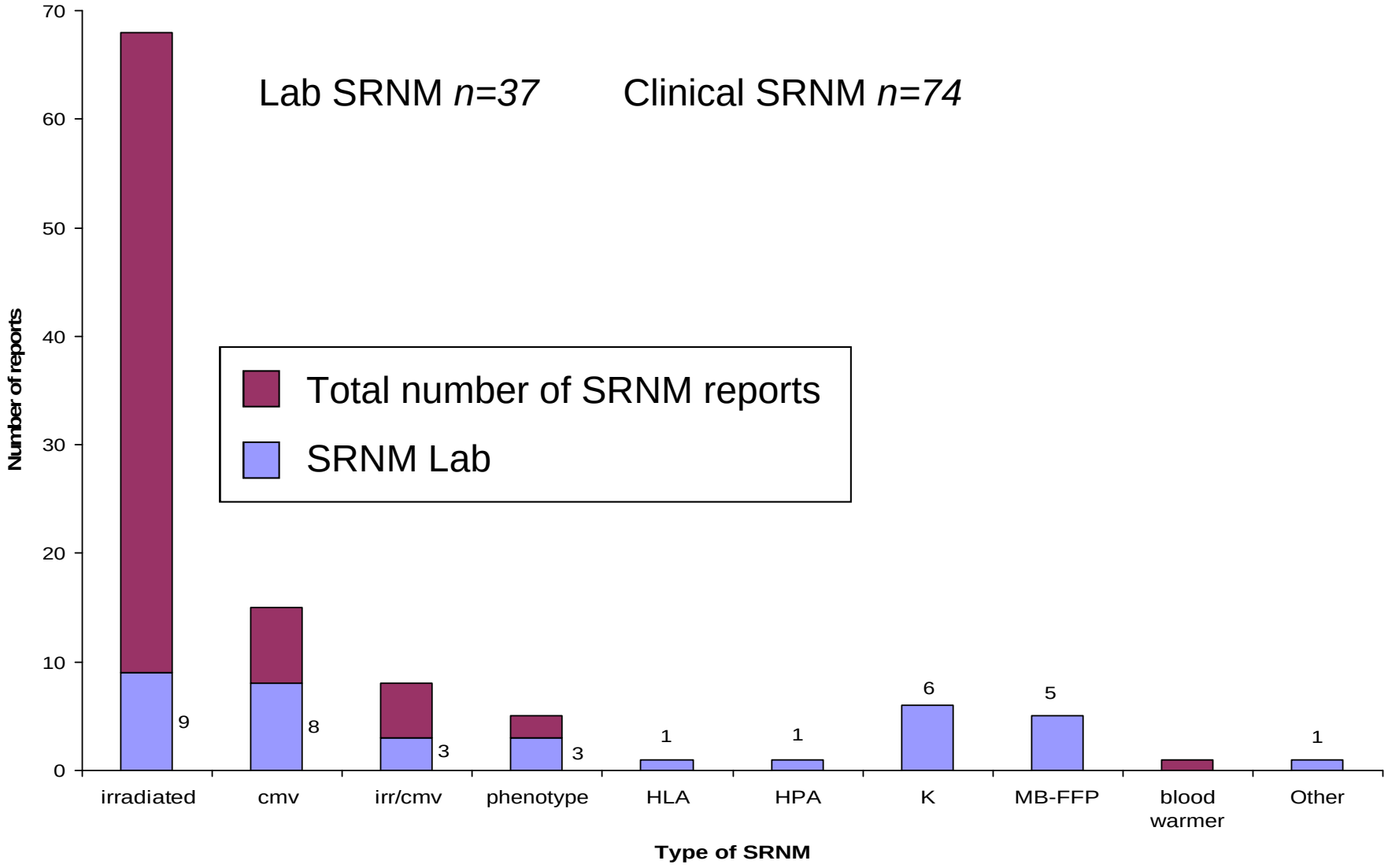


IBCT - comparison 2010 & 2009

Event	**2010**	**2009**
Administration of wrong blood	16	40
Wrong blood in tube	3	4
Lab errors leading to Tx ABO/RhD incompatible rbc	3 (1ABO/2RhD)	5 (2/3)
Compatible, but wrong group for SCT patient	15	13
Other pre-transfusion testing errors	52	64
Special requirements not met *(clinical)*	74	87
Special requirements not met *(laboratory)*	37	67
Miscellaneous	0	2
TOTAL	**200**	**282**

29% overall reduction in IBCT reports (*57% clinical & 28% laboratory)*

SRNM – lab & clinical



SRNM – lab

- Can be due to poor serological knowledge/carelessness in selection
  - Incorrect phenotype selection

- Failure to recognise the needs of specific patient groups
  - K positive units against national recommendation/local protocol
  - Non MB-treated FFP and cryoprecipitate to children <16 yrs old
  - CMV unscreened units to children <1 yr old
  - CMV unscreened units to pregnant women

- Failure to consult patient records thoroughly

I&U *n=110*

- NPSA/2010/RRR/017: The transfusion of blood and blood components in an emergency
- Under/delayed added to I&U to reflect this
- Increased to 110 reports in 2010 (92 in 2009) including 2 cases of under/delayed – thought to be under reported

Common Causes:

- sample from drip arm

- erroneous result (POCT/BGA, clotted, incorrect machine used)

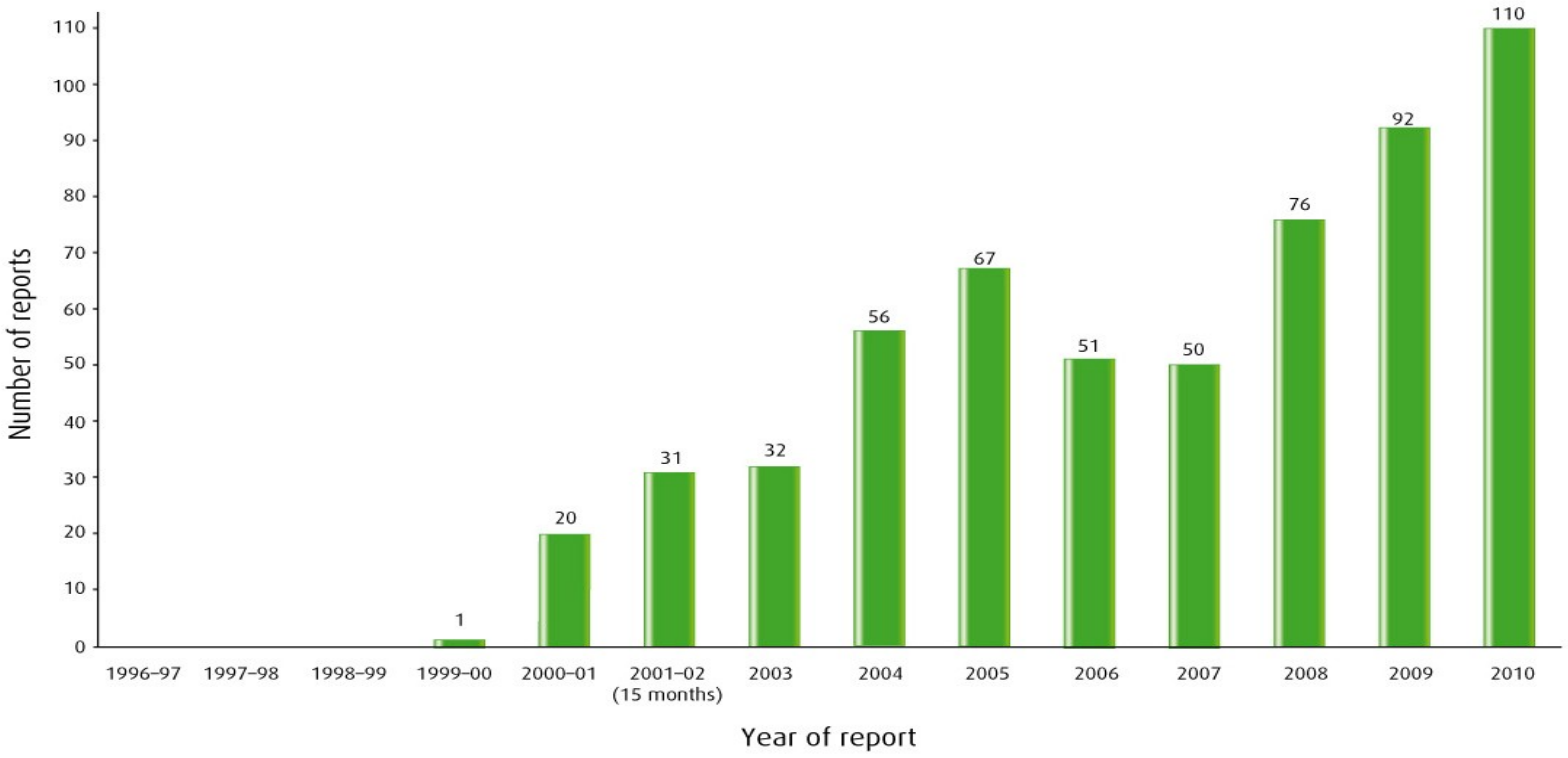
- verbal miscommunication, poor handover, Hb of wrong patient/WBIT

- poor pre-transfusion assessment & poor prescribing knowledge

SHOT I&U reports 1996 – 2010

- causing patient harm

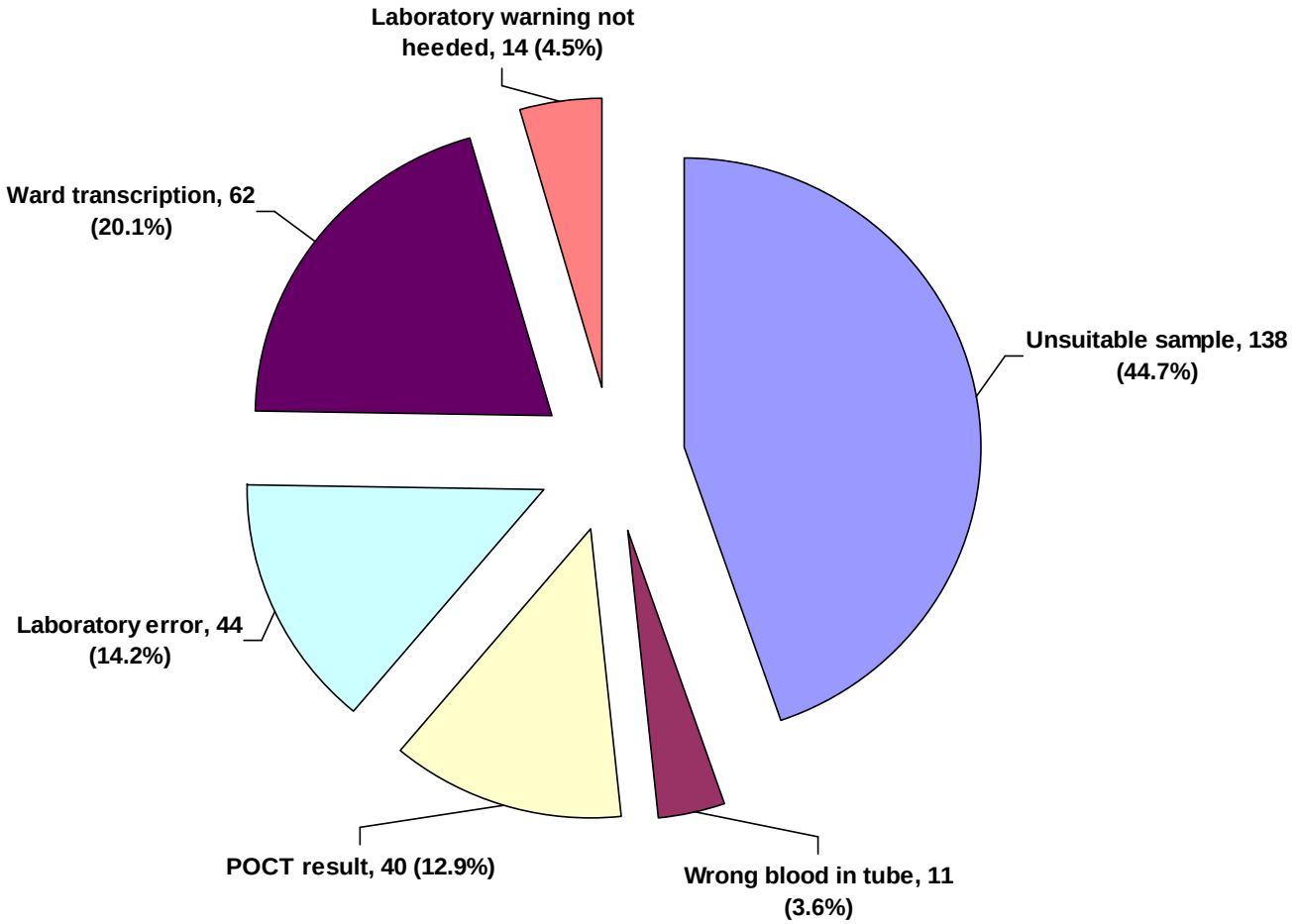
Figure 6
Cases of inappropriate and unnecessary transfusion 1996–2010



2010 - 48 I&Us based on wrong Hb

Causes of falsely low Hb measurements	Cases
Phlebotomy from drip arm (lab requested repeat)	6
Faulty sample - clotted, short, etc. (lab requested repeat)	7
Old Hb level though a more recent one was available	4
Result belonged to another patient (includes 3 wrong blood in tube)	9
Erroneous POCT results (includes blood gas machines and glucose level!)	9
Unauthorised result viewed on ward and acted upon	1
White cell count used as Hb (transcription)	3
Verbal miscommunication of results	3
Lab error (e.g. authorising result from clotted sample)	3
Other/Unknown	3
TOTAL	**48**

Transfusions given on the basis of unsuitable samples or incorrectly documented results 2000-2010 (n = 309)



Learning points - 2010

- 12% of the reported unnecessary transfusions could have been avoided if laboratories had not transmitted results they knew or suspected to be inaccurate, but instead requested a second sample
- A further 12% could have been avoided if laboratories had required confirmation of correct transmission of telephoned results according to CPA Standard G3.

HSE *n=239*

- 68% increase in excessive time to transfuse (*n=116)*
- 50% increase in technical administration errors *(n=18)*
- 6% reduction of expired components transfused *(n=29)*
- 13% reduction in cold chain errors (*n=73)*

Near Miss *n=863*

- Near miss = no products transfused
- Near miss reports identify potential weak points

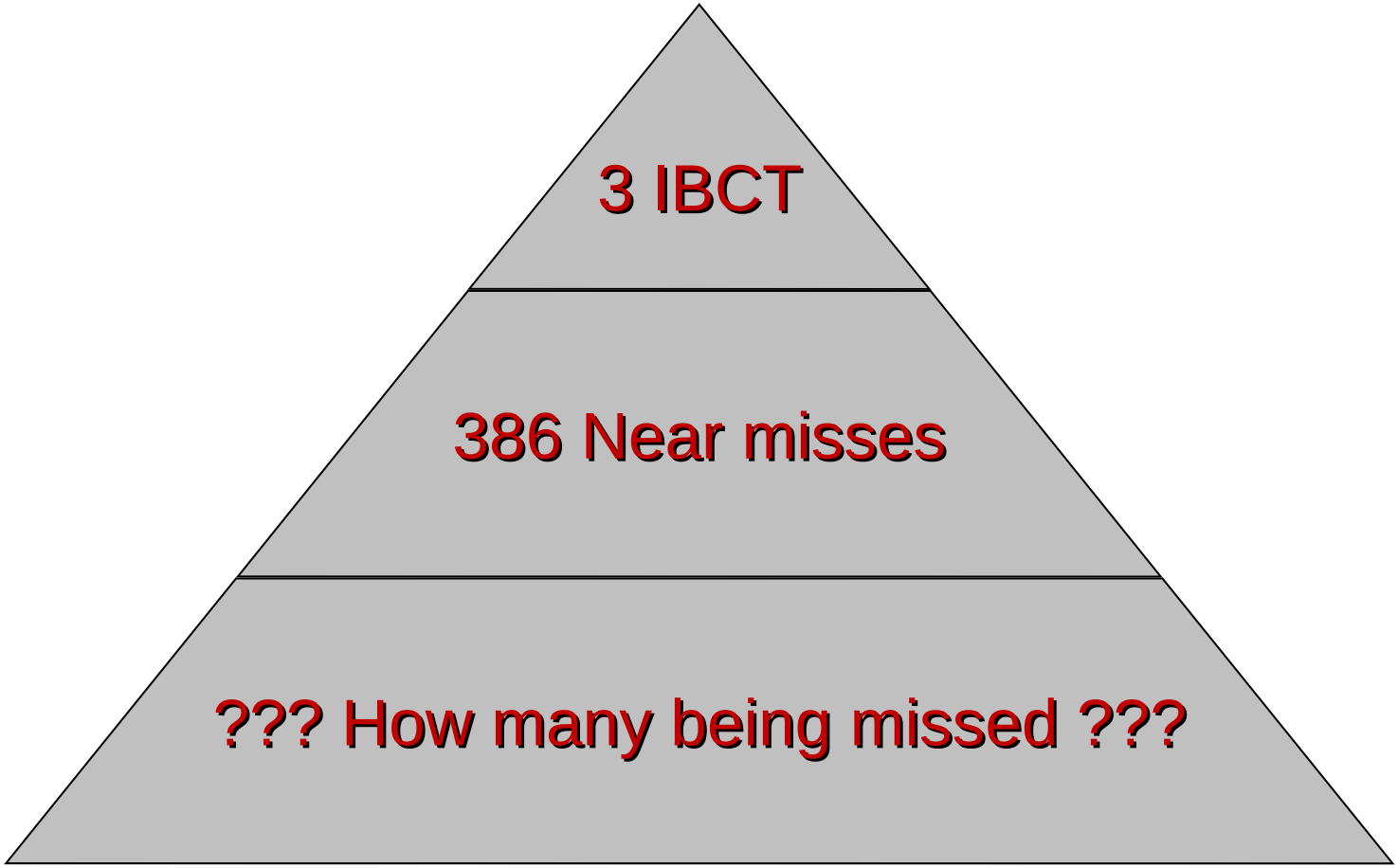
  - may lead to an error or event on another occasion
- Enable measures to be put in place to address issues

  - can prevent harm to patient.
- Same root cause as reported actual transfusion errors

Near miss categories

Category of incidents	No. of cases
Sample errors	409
Request errors	44
Laboratory procedural or testing errors	119
Laboratory component selection errors	100
Component collection/administration errors	50
Expired components available	29
Cold chain events	97
Others	15
Total	**863**

Wrong Blood In Tube *(WBIT)*



Anti-D Events in 2010 *n = 241*

- **59** cases where anti-D was inappropriately administered - *unnecessary exposure to a human blood product*
- **166** cases where anti-D was delayed or omitted, putting patient at risk of sensitisation to the D antigen - *potential Major Morbidity*
- **12** cases where the wrong dose of anti-D was administered
- **4** handling and storage errors

Anti-D….who makes the errors ?

- Midwives	178	(74 %)
- Laboratory	51	(21 %)
- Medical staff	12	(5 %)

Case Study *(Anti-D)*

RhD testing by rapid manual technique results in inappropriate administration of anti-D

A BMS, during a routine working day but under 'intense pressure' from clinical staff, performed RhD testing by a rapid manual technique and issued anti-D on the basis of a RhD negative result.

Later testing by the routine laboratory methodology showed the patient to be RhD positive.

Common themes – in labs

- Communication between staff involved in process:
  - Lab/Clinical
  - Lab/Blood Service
- Automation related errors result in majority of SRNM:
  - Ignoring warning flags
  - Not updating warning flags
  - Not consulting patient history
- Failure to follow procedure or lack of knowledge:
  - wrong component selection
- Incorrect labelling:
  - consider no. Near Miss/RBRP cases of a similar nature.
- Erroneous results (I&U):
  - Haematology laboratories.

Common themes – assumption

- We all make mistakes!

- Never assume others have completed their part of the process completely or correctly.

- Always carry out any necessary checks again yourself.

- If something doesn't look or feel right – query it.

  - *blood results*

  - *appearance of the component/labels*

  - *prescription*

Interactive Case Studies – 1

A BMS on duty was unable to identify an antibody specificity and issued crossmatch compatible blood, which was transfused. A senior BMS reviewed the antibody identification results prior to authorization of the antibody report. The senior BMS thought that the results were indicative of anti-Fya and performed additional testing with Fya homozygous cells. Results indicated likelihood of anti-Fya. The BMS then looked back at historical data for the patient on a separate database and found a previously detected anti-Fya but this data was not available on the current IT system

HSE

Near Miss

IBCT – Clinical

IBCT – Laboratory

Interactive Case Studies – 2

A nurse was instructed to take a blood sample from the patient in Bed 2. She was given no documentation and continued to label the sample with the information contained in the notes for that bed number. However, it was not appreciated that a different patient was now occupying that bed 2 and that the request should have applied to the patient in bed 3. The error was noticed during laboratory testing prior to transfusing

IBCT

HSE

Near Miss

RBRP

Interactive Case Studies – 3

A 64-year-old male patient on ITU received 3 units of red cells during an emergency laparotomy. Biochemistry results were phoned to the ITU and an albumin of 6 g/dL reported, but a nurse documented this result as a Hb of 6 g/dL. Four units of red cells were then transfused on the basis of this result, resulting in a post-transfusion Hb of 17.6 g/dL.

IBCT

HSE

I&U

RBRP

Interactive Case Studies – 4

A patient was transferred from his primary hospital, where he had undergone a stem-cell transplant, to another hospital within the same Trust in order to access an ITU bed. Each site has a blood transfusion laboratory. Platelets were requested by ITU and issued by the hospital transfusion laboratory. Irradiated components were not requested due to the lack of communication between the clinicians, and the laboratory records were separate from those at the originating hospital

I&U

IBCT (SRNM)

Near Miss

IBCT (WBIT)

Interactive Case Studies – 5

Following abdominal surgery a patient fell in the ward and fractured her femur. Her most recent previous Hb was 15.9 g/dL. On testing a new FBC sample the BMS called the ward, gave an Hb of 6.1 g/dL, and requested another sample as he thought the result was incorrect. However, the result was passed to the medical team on the ward round by a nurse who did not mention the need to repeat the test. On the basis of the erroneous result, even though clinically there was not extensive bleeding, a 4-unit red cell transfusion was ordered by the consultant, and all 4 units were given without further review. The patient's Hb was 20.2 g/dL before surgery on the following day, and the anaesthetist was aware of this. The patient developed cardiac failure and died. This was thought to be probably related to the excessive transfusion.

I&U

TACO

IBCT

Near Miss

SHOT Symposium 2012

Thursday 5th July 2012

The Lowry Theatre,

Manchester

Delegate rate £69 (same as last year)

SHOT Website

www.shotuk.org

SHOT / RCA Toolkits

Reports and Summaries

Lessons for Laboratory Staff

Lessons for Clinical Staff

Acknowledgements

- SHOT office in Manchester
- Steering Group
- Working Expert Group
- Hospital Transfusion Committees for reporting

Thanks for listening

Any questions?