Highlights from the Annual SHOT Report 2013

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Medical Director
Serious Hazards of Transfusion
SHOT Cumulative data: 17 years \( n=13,141 \)

- Unclassifiable complications of transfusion
- Post-transfusion purpura
- Transfusion-transmitted infection
- Transfusion-associated dyspnoea
- Cell salvage and autologous transfusion
- Acute transfusion reaction
- Transfusion-associated graft vs host disease
- Alloimmunisation
- Transfusion-associated circulatory overload
- Transfusion-related acute lung injury
- Haemolytic transfusion reaction
- Avoidable, delayed or undertransfusion
- Anti-D immunoglobulin errors
- Handling and storage errors
- Incorrect blood component transfused

Transfusion reactions which may not be preventable

Possibly or probably preventable by improved practice and monitoring

Adverse events due to human factors

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Breakdown of reports

3568 reports

- 303 incomplete as of 31/12/2013
- 670 withdrawn
- 2595 completed and included in 2013 report

2751 Total Reports analysed

156 reports started 2012 completed 2013

1571 incidents

Errors 77.6%

- Errors 955 62.4%
- Pathological reactions 616 39.2%

Near miss 996
RBRP 184
All errors
Reporting levels for SHOT and MHRA

MHRA SAR 349
SAE 705 of which
97.8% Human errors
Everything is awesome!

Emmet loves to follow instructions, to stick with the checklists

Everything is cool when you’re part of a team

Everything is better when we stick together
It’s not OK to do your own thing

• ‘To achieve a continual reduction in harm, we must persist in reducing unwanted variation, better share learning from mistakes and from improvement activity, and continue to promote professional responsibility’
  – Standardisation
  – Education and training
  – Harmonisation of activity to support patient safety
Human factors

Errors with potential for harm 955

- Wrong component transfused 57
- Specific requirements not met 190
- Avoidable 120, delayed 34, undertransfusion 7

- Anti-D Ig 354
- Handling and storage 193

Errors with no harm 1180

- Near miss 996
- Right blood right patient 184

1 ABO death

5 deaths from delays
Risks associated with transfusion

<table>
<thead>
<tr>
<th>SHOT reports</th>
<th>Risk per components issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total risk of death</td>
<td>1 in 125,000</td>
</tr>
<tr>
<td>Total risk of major morbidity</td>
<td>1 in 19,157</td>
</tr>
<tr>
<td>Risk of ABO incompatible red cells</td>
<td>1 in 263,157</td>
</tr>
<tr>
<td>Risk of wrong component</td>
<td>1 in 48,309</td>
</tr>
<tr>
<td>Risk of specific requirements not met</td>
<td>1 in 14,514</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transfusion-transmitted infections</th>
<th>Risk of infected donation entering blood supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV</td>
<td>1 in 1.3 million</td>
</tr>
<tr>
<td>HCV</td>
<td>1 in 28.6 million</td>
</tr>
<tr>
<td>HIV</td>
<td>1 in 7.1 million</td>
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</tbody>
</table>
Deaths where transfusion was causal or contributory 2011-2013 (n=39)

**ADU**  1  Inappropriate and 5 delayed transfusion

**IBCT**  1  ABO incompatible transfusion

**PTP**  1  Post-transfusion purpura

**ATR**  2  Acute transfusion reactions

**HTR**  3  Haemolytic transfusion reactions

**TRALI**  2  Transfusion-related acute lung injury

**TACO**  20  Transfusion-associated circulatory overload

**Unclassifiable**  3  -  2 infants with necrotising enterocolitis and 1 adult after IVIg

**TA-GvHD**  1  transfusion-associated graft versus host disease
Delayed transfusions reported to SHOT
69 cases over 4 years

Not all delays relate to major haemorrhage.
SHOT accepts any case where the clinician considers there has been delay
Delayed transfusions reported to SHOT

- Age range birth to 86 years
- Sick patients with high mortality 21/69 (30.4%)
- In 10/69 (14.5%) death was definitely or possibly related to the delay – 5 of these in 2013
- Causes of delay:
  - Failure to identify patients properly
  - Poor communication
  - Poor handover
  - Slow clinical response in critical situations
Cardiac arrest follows delayed admission to the Emergency Department

• An elderly woman collapsed at home but the ambulance was ‘stacked up’ waiting outside the emergency department for 3h

• A further delay of 2h occurred before assessment when her Hb was found to be 38g/L and she was noted to have melaena

• She suffered cardiac arrest

• The MHP was activated and she received O RhD negative blood while further units were crossmatched. She made a full recovery
Outcome of ABO incompatible red cell transfusions
66% have no adverse effect

- 15 deaths to 2005
- 4 deaths 2006-2013

BSQR
NPSA SPN 14
Competency assessments

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ABO-incompatible transfusions:
Relationship between volume transfused and reaction
Recommendation

ALL ABO incompatible transfusions should be included by NHS England as Never Events, not just those associated with serious harm or death
Change in culture 2000 onwards?

- Introduction of the ‘no blame’ culture
- Importance of learning from our errors
- Need for full and honest reporting
- So how are hospitals dealing with serious adverse reactions and errors?
Local newspaper
Front page headline:

HOSPITAL STAFF SACKED OVER BLOOD BLUNDER

Two workers dismissed for putting patient’s life at risk
Multidisciplinary steps in the transfusion process

1 REQUEST

2* SAMPLE

3 SAMPLE RECEIPT

4 TESTING

5 COMPONENT SELECTION

6 LABELLING

7 COLLECTION

8 PRESCRIPTION

9* ADMINISTRATION

* Critical points where positive patient identification is essential
Incorrect blood component transfused
Where are the mistakes made?

Clinical errors
Laboratory errors

Number of errors

Request: 109
Sample taking: 2
Sample receipt: 30
Testing: 30
Component selection: 58
Labelling: 3
Collection: 26
Prescription: 132
Administration: 157

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Incorrect blood component transfused

Data from 220 reports
547 errors
Incorrect blood component transfused

The common combinations of three:

- 78% request, prescription and administration
- 12% collection, prescription and administration

Data from 220 reports 547 errors
Good detection
Most near miss events are wrong blood in tube

715 NM events could have resulted in an incorrect blood component transfusion. 637 (89%) of these were wrong blood in tube samples. 532 (84%) were detected by the laboratory.
Competency based training is a framework for incompetence

‘When novice artists joined the studios of the great Renaissance painters, I suspect they didn’t just want to be assessed on how they used a paintbrush ...

It’s about seeing the whole picture in its complete form and coordinating the work of others whose focus is on a small area’

Jonathan Glass BMJ: 7 June 2014
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Competency assessments had been passed by 66.7% of persons responsible for errors (9.3% not, 24% not answered)

Jonathan Glass BMJ: 7 June 2014
There is too much to remember
Who uses a ‘to do’ list?

It must be...

- close to restaurants
- close to Mediterranean beaches
- heated swimming pool
- private and secluded

I do!

Astronauts do!
Teenage robber trapped by DIY crime checklist

A teenager who robbed and sexually assaulted a young woman was caught by police after they discovered a checklist of how to commit a crime at his home.

Zach Jackson's five-point instructions were to wear black clothes and gloves, warm up beforehand, look out for CCTV — and grab.

Preston crown court was told that Jackson, then 18, slapped his 19-year-old victim, sexually assaulted her and grabbed her phone on December 14 last year. The victim's father used a signal to find the location of the phone and Jackson was traced by police.

When officers checked his home, they found the note-book with his crime guidelines. Roger Brown, for the prosecution, said the victim had been on a night out with friends in Blackpool and been unable to get a lift home. She saw a male standing in the doorway of a house.

The court was told that during the incident, Jackson slapped her so hard that she fell to her knees. He bent over, put his hand under her clothing and sexually assaulted her. He then grabbed her mobile phone and ran off.

Jackson, now 19, of Blackpool, admitted robbery and sexual assault and attempting to possess cocaine with intent to supply. He was jailed for three years and placed on the sex offenders register.

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The Times Saturday July 5th 2014
Recommendation

Use an aide-memoire at the bedside to check the key 5 points

1. Positive patient identification
2. Check identification of component against patient wristband
3. Check the prescription: has this component been prescribed?
4. Check the prescription: is this the correct component?
5. Check for specific requirements – does the patient need irradiated components or other specially selected units?
But this is not enough

- SHOT has been reporting errors as the main category causing harm to patients for 17 years
- Errors are the most common cause of MHRA serious adverse events – 97.8%
- The correct process is difficult to follow
- Can we redesign the process?
Designing out error
Designing out error
Recommendation

Process redesign

Process mapping and engagement of the human factors specialists

Working through:

National Blood Transfusion and Regional Transfusion Committees
NHS England Patient Safety Domain
National Comparative Audit Programme
What about the other Serious Adverse Reactions?

Transfusion-associated circulatory overload
Acute allergic transfusion reactions
Cumulative TACO-related deaths  n=36
Cases of major morbidity n=122

Includes 4 deaths and 5 cases of major morbidity from avoidable transfusions

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58% of all TACO reports occur in patients ≥70 yrs (2008-2013)

Median age TACO in 2013 = 77.5 yrs
Median age of all cases = 57 yrs
Recommendation

Don’t give two without review
Acute transfusion reactions

Number of cases

Year of report

2005 2006 2007 2008 2009 2010 2011 2012 2013

Minor reactions excluded

Anaphylaxis Other

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Transfusion reactions may occur hours or days later

- Transfusion-associated circulatory overload
  - An elderly lady felt unwell on her way home, came back to the emergency department, suffered respiratory arrest and was admitted to ICU

- Haemolytic transfusion reactions
  - A patient developed symptoms and signs of haemolysis 8 days after transfusion which was not recognised as such by the GP

- Some allergic reactions
Recommendation

Patients transfused as day cases or outpatients must be given printed advice and a 24-hour contact telephone number and warned to report any adverse symptoms or complications.
Teamwork

- Safe transfusion is a partnership involving several groups of professionals
- Good communication is essential
- Don’t make assumptions about other people’s safe practice
Transfusion is very safe
Thanks to the hard work of all of us

Everything is awesome!
Deaths definitely attributed to transfusion
1996/97 - 2013

- Total no. of reports analysed
- Death definitely attributed to transfusion

- 34%
- 10.5%

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‘Can you believe it?’
A wrong result

• An elderly woman was visited at home by her GP to assess her leg swelling
• He decided to do a blood test, and took the blood sample
• As he did not have any tubes with him, he walked 10 mins back to the surgery to decant the blood into a sample tube before sending it to the hospital laboratory

Error 1
...continued

- The hospital contacted the emergency GP service out of hours to report a Hb of 76g/L
- The GP arranged immediate admission to MAU
- On admission further samples were taken for a repeat FBC and crossmatch for 2 units
- The 2 units were issued at 07:14 and transfused at 09:55
- The Hb result had been authorised at 06:38 and was normal (114g/L)
...continued

Error 2: Was she questioned about symptoms or examined to see if transfusion was appropriate?

Error 3: Why did transfusion proceed without review of Hb result?

She was probably very anxious and spent a whole night without sleep during an unnecessary admission.
Putting the patient at the centre of everything we do

MHRA
1282 reports

SHOT
3568 reports

Patient Blood Management

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Feedback to individual laboratories

Putting the patient at the centre of everything we do

MHRA
1282 reports

From blood safety

Detailed analysis
Trending
Clinical feedback

to transfusion safety

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Acknowledgements

- The SHOT team
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