Near Miss Reporting (NM) n=1243

8

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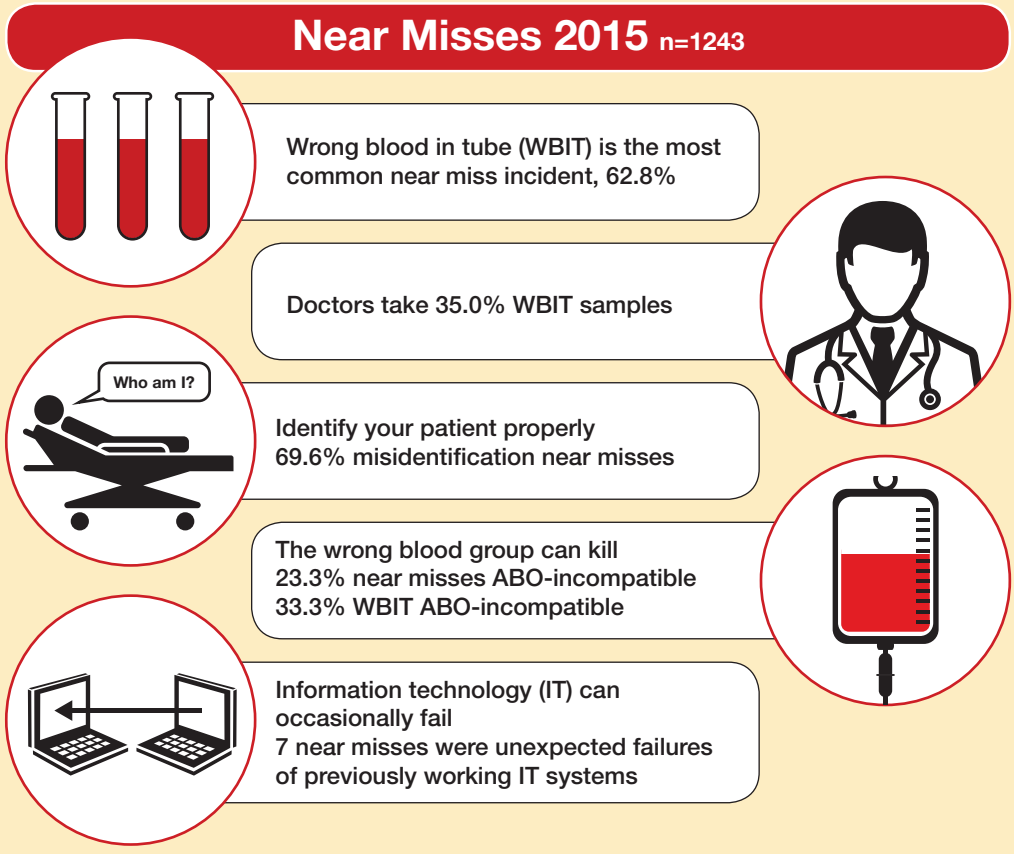
Definition:

A 'near miss' event refers to any error which, if undetected, could result in the determination of a wrong blood group or transfusion of an incorrect component, but was recognised before the transfusion took place.

Near miss reports continue to increase, n=1243 in 2015 from n=1167 in 2014.

Key SHOT messages



Discussion of near miss errors in other chapters

In order to highlight the importance of continuing to report and learn from near miss incidents, full discussions of these cases are incorporated into each relevant chapter according to the likely outcome if the near misses had progressed to full incidents and components had actually been transfused. Table 8.1 details the subcategorisation of near miss events according to SHOT definitions.

Table 8.1: Categorisation of all near misses according to SHOT definitions

Categorisation of all near misses according to SHOT definitions		Related chapter	Number of cases	Percentage of cases
Incorrect blood component transfused (IBCT)	Wrong component transfused (WCT)	Chapter 6	889	71.5%
	Specific requirements not met (SRNM)		97	7.8%
Right blood right patient (RBRP)		Chapter 19	130	10.5%
Handling and storage errors (HSE)		Chapter 20	97	7.8%
Adverse events related to anti-D immunoglobulin (Anti-D Ig)		Chapter 9 & 21	23	1.8%
Avoidable, delayed or undertransfusion (ADU)		Chapter 7	7	0.6%
Total			**1243**	**100%**

Reporting of near miss errors

Wrong blood in tube incidents (WBIT) are the most frequently reported errors, 62.8% (780/1243) of all near misses in 2015, but important lessons can be learnt from all near miss errors, so continued reporting is strongly encouraged.

ABO incompatibility prevented by detection of near miss incidents n=288

ABO-incompatible red cell transfusions could have resulted from 288/1243 (23.2%) near miss events. More than half of these would have been the most high risk error of group A red cells being transfused to a group O patient (145/288, 50.4%). Previous SHOT analysis (Bolton-Maggs et al. 2014) indicates approximately one third of ABO-incompatible transfusions result in death or major morbidity.

Table 8.2: Potential ABO-incompatible transfusions

Potential incorrect ABO transfusions	Number of cases	Percentage of cases
A to O	145	50.4%
B to O	46	16.0%
A to B	28	9.7%
B to A	26	9.0%
AB to O	11	3.8%
AB to A	10	3.5%
AB to B	5	1.7%
Groups not stated	17	5.9%
Total	**288**	**100%**

ABO mismatches that would not result in incompatible red cell transfusions could still be unsuitable for transfusion of plasma components. There might also be circumstances where the patient has red cell antibodies that have not been detected, because the WBIT sample tested was not their blood, Case 8.1.

Case 8.1: WBIT could have resulted in a transfusion incompatible for both ABO and K

A sample was received from the emergency department (ED). The sample acceptance criteria were met. The patient's historical record was group A D-positive, with anti-K. The sample received tested as AB D-positive, as a result of a wrong blood in tube error.

Alongside potential ABO incompatibilities, there were also 83/1243 (6.7%) cases where patients were at risk of D mismatches, of whom 30/83 (36.1%) were females of childbearing potential.

Potential D-mismatches		Number of cases	Percentage of cases
D-positive to female of childbearing potential n=30	ABO-incompatible and D-mismatch	16	19.3%
	D-mismatch alone	14	16.9%
D-positive to others n=53	ABO-incompatible and D-mismatch	14	16.9%
	D-mismatch alone	39	47.0%
Total		**83**	**100%**

Table 8.3: Potential D-mismatched red cell transfusions

It is important to understand that the severity of an error is not related to the outcome. Near miss errors, such as the 288 that might have led to ABO-incompatible transfusions, could in more unfortunate circumstances have led to death or major morbidity. SHOT is aware of individual staff members who have been disciplined or dismissed because an error in transfusion has led to patient harm. When compared with the potential outcome of these near miss events, it may be inappropriate to assign blame to staff only when the outcome is more severe, because the potential outcomes of all these events could be equally catastrophic. Within the field of human factors it is recommended that institutions adopt a 'just culture' policy (Dekker, 2012) where staff members are not punished unless there has been wilful violation or gross negligence (see also further comments in the Error Reports: Human Factors section).

Importance of group-check policy

A small sample of wrong blood in tube cases (43/780) were analysed where the reporter mentioned the policy of requiring a group-check sample, as recommended in the British Committee for Standards in Haematology (BCSH) guidelines for pre-transfusion compatibility (BCSH Milkins et al. 2013) (Figure 8.1). Reports of a further 4/780 WBIT cases indicated that a group-check policy had not yet been introduced.

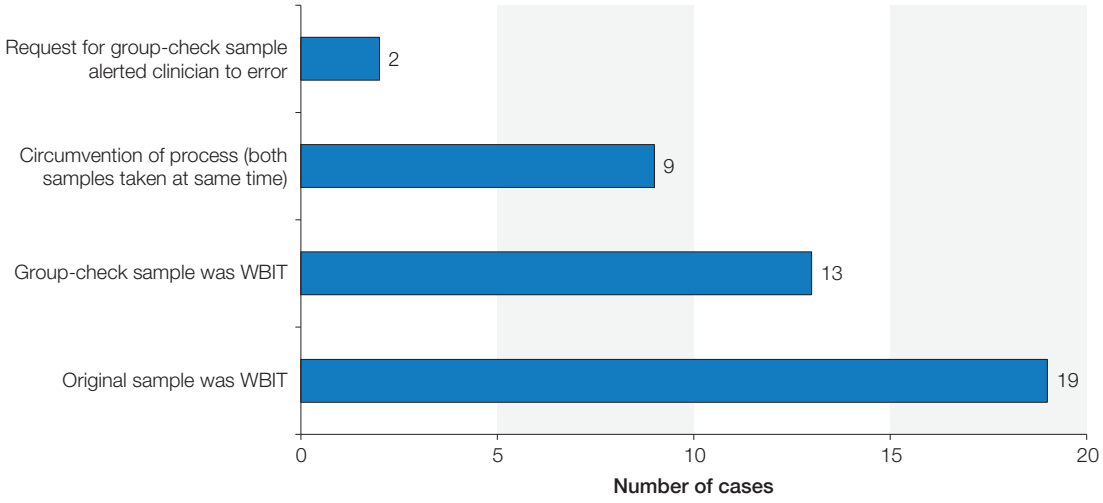


Figure 8.1: Outcomes of testing a group-check sample on a previously unknown patient n=43

These numbers may not be very representative of the process as a whole. Use of the group-check policy is becoming part of routine practice, so reporters may not mention the policy when a repeat sample detects an earlier WBIT (19/43, 44.2%), but may be more likely to refer to the policy when either the group-check sample was a WBIT (13/43, 30.2%) or there has been a circumvention of the process (9/43, 20.9%). In the circumvention of process incidents, 6/9 cases revealed that two samples were taken at the same time from the wrong patient. A specific question about the group-check policy has been added to the SHOT WBIT questionnaire from January 2016.

Case 8.2: The transfusion group-check policy highlights an error in non-transfusion samples

A group and screen sample was taken on a previously unknown patient. The group-check sample taken the next day showed a discrepancy with the blood group and the investigation revealed that the first sample was a wrong blood in tube. Non-transfusion blood samples taken at the same time

as the initial error were also from the wrong patient and this impacted on the patient's care, because abnormal liver function test results were not recognised for a further 24 hours.

Case 8.3: Incorrect second sample reveals other underlying poor practice

A group and save sample grouped as O D-positive. A few days later a group-check sample was taken, because the patient was having a surgical procedure, but this grouped as AB D-positive. The patient was re-bled to check the group and this confirmed the patient was O D-positive. Although not relevant to this case, which was separated by a few days, the investigation revealed that when the individual involved was aware that two samples for grouping were needed, she would ask a colleague to check the patient details with her and take both samples together, instead of following the correct procedure where two separate people identify and bleed the patient at different times.

A further danger was highlighted unexpectedly and is not included in the data in Figure 8.1, because a group-check sample is not required when secure electronic sample labelling is used. Case 8.4 revealed that a supposedly secure electronic labelling system was being used incorrectly.

Case 8.4: WBIT shows a secure electronic labelling system was being used incorrectly

Two samples were sent for the same patient from the ED. Sample bottles were electronically labelled and forms and bottles matched. As the bottles had been electronically labelled, a group-check sample was not required and a single sample would have been deemed safe for transfusion purposes. The laboratory was alerted by a telephone request for another patient in the ED, from whom no sample had been received. When the two samples labelled for the same patient were tested, one sample grouped as B D-positive and the other as O D-negative. The sample taker confirmed when taking the WBIT sample the patient wristband was scanned with the electronic labelling system handheld device without it being on the patient's wrist. In addition, no verbal confirmation was done of the patient identity and all of the labelling was done away from the patient.

Learning point

- Continued education is needed to ensure all staff understand the reasons for a group-check policy and the possible consequences of trying to circumvent the system

Since the BCSH guidelines for pre-transfusion compatibility (BCSH Milkins et al. 2013) recommended the introduction of a group-check policy, there has been some debate about what constitutes a historical sample. This was summarised in a presentation at the 2015 UK National External Quality Assessment (NEQAS) *Blood Transfusion Laboratory Practice* (BTLP) and British Blood Transfusion Society (BBTS) Blood Bank Technology Special Interest Group (Rowley 2015). SHOT data from WBIT reports in 2015 show that 66/780 were historical WBIT samples. Many of these historically incorrect samples were taken close to the repeat sample that demonstrated the error, 32/66 in the same year 2015, many of these within the same patient episode and 11/66 in the previous year, 2014. However, the dates of historical WBIT errors stretch back as far as 1990 and 7/66 were tested before 2000. It is doubtful if records that old could be treated as valid historical groups.

Learning point

- Local group-check policies should include a cut-off point, before which a historical record in that institution should not be considered valid and a further group-check sample should be requested

Quality management systems

Quality processes and checking procedures can prevent errors leading to incorrect transfusions, but there were elements of good fortune in the detection of 261/1243 (21.0%) of near miss cases. A further 581/1243 (46.7%) were found as a result of testing anomalies, usually a different ABO/D group, which is only possible if the incorrect sample is of a different group. Hence there was an element of good fortune in the detection of 842/1243 (67.7%).

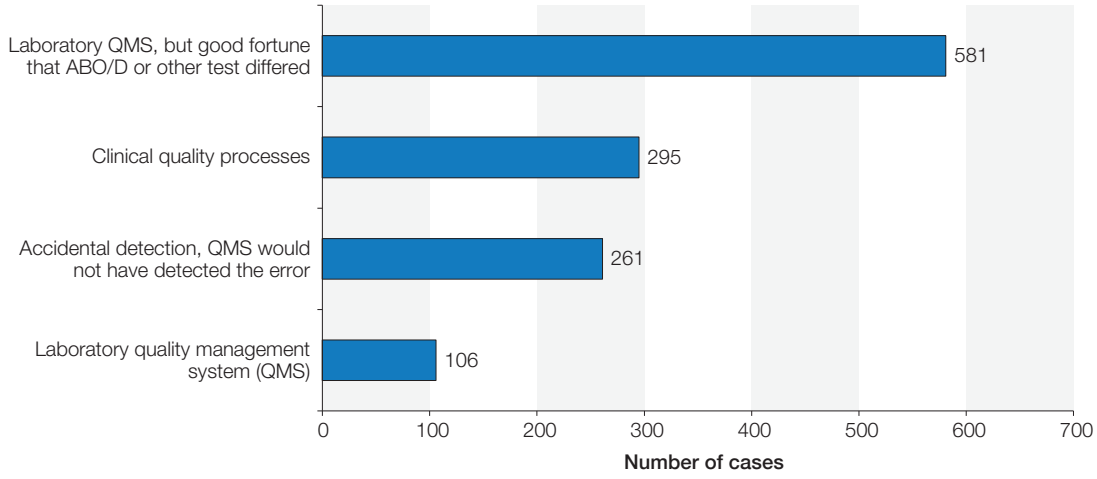


Figure 8.2: Near miss detected by quality management system or good fortune

Staff groups responsible for taking WBIT samples

As in previous years doctors are the largest group that take WBIT samples (Figure 8.3), but in general it is not known what proportion of transfusion samples are taken by different staff groups. Data provided from the Oxford hospitals, which use a fully electronic system, provide some denominator evidence. Comparison of the percentages of each group who take transfusion samples shows that doctors and midwives are overrepresented in the WBIT group.

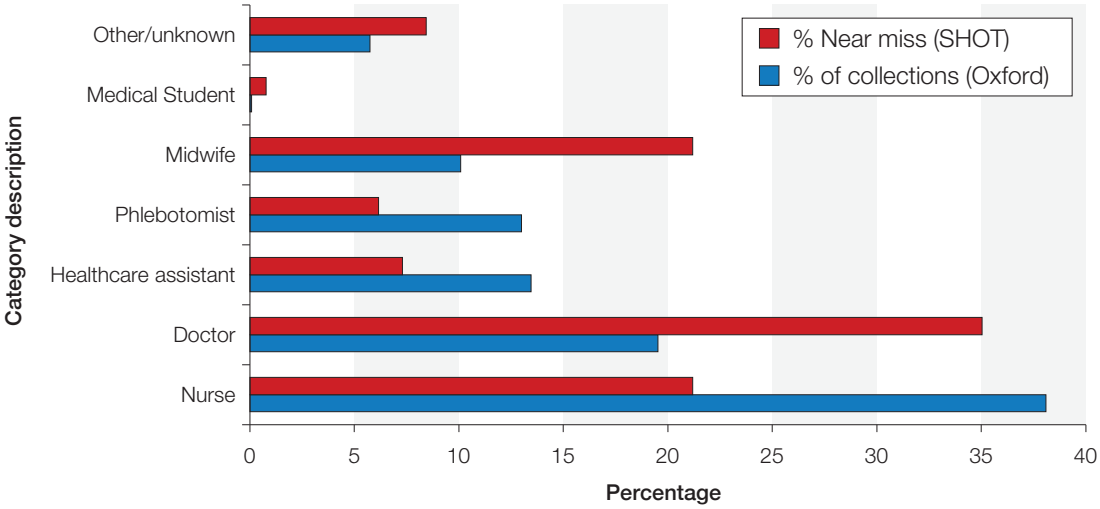


Figure 8.3 Staff groups responsible for WBIT samples reported to SHOT (n=780) compared with staff groups who take all transfusion samples in Oxford Hospitals. Total Oxford samples n=14802 (3 months January to March 2016)

With thanks to Professor Mike Murphy and colleagues for making these data available

Case 8.5: Sample labelling error on a cord sample reveals WBIT caused by dangerous practice

A cord blood sample was received to check whether anti-D immunoglobulin (Ig) prophylaxis was required for the mother. This grouped as O D-negative. However, the sample was missing the baby's hospital number, so a repeat sample from the baby was requested, which grouped as A D-positive. A further sample confirmed the correct group as A D-positive. On investigation it was discovered that at delivery the placenta and cord had been disposed of in a clinical waste bin. After realising a cord blood sample should have been taken, the midwife sampled the placenta in the bin. However there was more than one placenta in the clinical waste and the incorrect one was selected, so that cord blood from another baby was sent. As a consequence, it had initially been queried whether there could have been a switch of babies, until the discovery of the sampling error. If the error had not been discovered, then no prophylactic anti-D Ig would have been issued as the baby would have been reported as D-negative.

IT and analyser-related near miss reports n=7

As reported in 2014 there were again a small number of reports of unanticipated IT equipment failures leading to laboratory problems, n=7. These incidents were all in separate Trusts/Health Boards and all involved the IT not working as expected, including 3/7 where the patient demographics were populated with an incorrect group. Of those, 2/3 involved the same manufacturer and this was discussed with the Medicines and Healthcare Products Regulatory Agency (MHRA), when these incidents were reported under the Blood Safety and Quality Regulations (BSQR) (BSQR 2005), so the MHRA are aware of two similar issues related to the same analyser supplier.

The other 4/7 incidents involved IT equipment not working as it had previously (3/4), or as expected following additional programming requested of the manufacturer (1/4). Errors such as these are often the result of validation or testing failures when new or updated systems are implemented. Ongoing vigilance and validation is vitally important where reliance on IT is critical to the process, such as for electronic issue of blood as demonstrated by the ABO-incompatible transfusion (Case 6.1) reported in Chapter 6, Incorrect Blood Component Transfused (IBCT).

Further analysis of total near miss errors n=1243

Table 8.4: Numbers of near misses originating in clinical or laboratory areas

Category of incidents	Number of cases	Percentage of cases
Clinical errors	956	76.9%
Laboratory errors	287	23.1%
Total	**1243**	**100%**

Additional tables showing the subcategorisation of near miss errors consistent with those in previous Annual SHOT Reports (2010–2014) can be found in the supplementary information on the SHOT website www.shotuk.org.

COMMENTARY

Failure of patient identification is a common root cause of transfusion errors. In near miss cases misidentification can lead to WBIT or to collection or attempted administration of components intended for another patient. Patient identification failures contributed to 865/1243 (69.6%) of all near misses.

Wrong blood in tube incidents (WBIT) remain the most commonly reported near miss error, 780/1243 (62.8%) of all near misses. Reporters are encouraged to report all types of near miss, because valuable lessons can be learnt.

Near miss incidents show that errors can put patients at considerable risk of ABO-incompatible transfusions 288/1243 (23.2%) and at particular risk when the incident is a WBIT sample 260/780 (33.3%). A group-check policy is an effective quality improvement to detect wrong blood in tube events and all Trusts/Health Boards should implement the policy as detailed in the BCSH guidelines for pre-transfusion compatibility (BCSH Milkins et al. 2013) and recommended by SHOT in previous Annual SHOT Reports.

Laboratories are heavily dependent on IT systems and a small number of near misses (n=7) demonstrated that IT is not always 100% reliable. Robust validation and testing of IT can mitigate many of these problems and laboratory staff need to remain vigilant for unexpected failures.

References

BCSH Milkins C et al. (2013) **Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories**. Transfus Med 23, 3-35 http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3148.2012.01199.x/pdf [accessed 27 April 2016]

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