20. Near Miss Reporting

Definition

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

SHOT has been running a Near Miss pilot exercise in 2008–09, looking at errors associated with transfusion samples, with the aim of obtaining up-to-date denominator data against which to benchmark other transfusion errors.

The transfusion process can be conveniently divided up into stages, and there are already some barriers in place to detect or prevent errors at each stage, such as national guidelines incorporated into local policies and SOPs, but it is important to realise that some errors may 'get through' the systems and only be detected in retrospect.

- the **pre-testing** phase is where the bulk of sample errors might be expected to be detected. The main barrier in place is the application of national standards for sample labelling and acceptance, which must be incorporated into local policies. Sample errors rejected at this stage should be investigated locally but do not constitute a Near Miss event reportable to SHOT.
- the **testing** phase, where, despite apparent correct labelling, the blood in the sample has come from a different patient – 'Wrong Blood In Tube'. Detection of this type of error within the laboratory quality management system relies on there being a historical grouping record for the patient with which to compare the current result.

Phase 1 pilot study

This was carried out over a period of one calendar month, from 1st April 2008, and involved an intensive data gathering exercise by which all samples rejected at 'booking in' were categorised by a 'tick box matrix', as shown below. The pilot was carried out by the hospital transfusion laboratory staff.

		1	2	3	4	5	6	7	8	9
What was the error?	Handwritten details missing									
	Handwritten details incorrect									
	Addressograph label on sample									
	Handwritten error over a pre-printed ID label									
	Sample underfilled / inappropriate									
	Sample and request don't match									
Was the sample relabelled, and then tested?	Yes									
	No									
Who took the sample?	Doctor									
	Nurse									
	Midwife									
	Support Assistant									
	Phlebotomist									
	Not Known									
When was the sample taken?	Core hours (defined locally)									
	Non-core hours									

Where was the sample taken?	Emergency Department									
	Medical Admissions Unit									
	ICU / HDU									
	Pre-op clinic									
	Obs & Gynae									
	Neonatal									
	Paediatrics									
	General ward									
	GP / Community									
	Not known									

A total of 131 hospitals or Trusts expressed an interest in participating in the pilot study, and data was eventually received from 121 of these.

Participation by country

England	**92**
Wales	**5**
N. Ireland	**6**
Scotland	**6**
Channel I.	**2**

For the sake of usefulness in terms of numbers and percentages, the data from the Channel Islands hospitals has been included (with their kind permission) with that from England.

All transfusion samples received by participating laboratories in one month

	UK	E & CI	W	NI	S
No. samples	224, 829	187,265	15,812	8968	12,784
No. samples per hospital	82–6155	82–6155	123–2283	600–3020	702–5966

Samples rejected at booking in

	UK	E & CI	W	NI	S
No. samples	8535	6868	858	376	433
% Samples received that were rejected	3.8	3.7	5.4	4.2	3.4
Range	0.4% – 13.2%	0.4% – 13.2%	0.5% – 12.6%	2.0% – 7.3%	2.1% – 6.5%

NB Samples were counted as 'rejected' even if they were amended and subsequently accepted for testing.

The rate of sample rejection is fairly constant across the UK, but the rate for individual hospitals within the mean figure ranges from only 0.4% of samples received in the transfusion laboratory to over 13% samples received.

Relabelling of samples

	UK		E & CI		W		NI		S	
Hospitals allowing relabelling	47	*39%*	33	*35%*	8	*53%*	0	*0%*	3	*50%*
% samples relabelled	27%		27%		17%		0%		42%	

Many hospitals have adopted the concept of 'zero tolerance' towards sample errors, and insist that an erroneous sample is retaken, but it is clear that nearly 40% of hospitals across the UK, and 50% in Wales and Scotland, still allow amendments to be made prior to testing.

Of particular concern are the 271 cases (3.2% of all rejected samples) where samples have been relabelled despite not knowing who had performed the original venepuncture and labelling. This means the signing of the tube to convey responsibility for correct patient ID is meaningless. This can in no way be considered to be good practice, and must inevitably increase the risk of mislabelling and potential serious consequences for the patient.

Reason for sample rejection (may be more than one)

	UK		E & CI		W		NI		S	
Details Missing	3280	*37%*	2489	*35%*	477	*55%*	159	*42%*	155	*32%*
Details incorrect	3273	*37%*	2762	*39%*	173	*20%*	150	*39%*	188	*39%*
Addressograph label	500	*6%*	412	*6%*	39	*4%*	28	*7%*	21	*4%*
Underfilled or Inappropriate Sample	1142	*13%*	876	*12%*	157	*18%*	31	*8%*	78	*16%*
Sample / Form different	583	*7%*	511	*7%*	23	*3%*	13	*3%*	36	*8%*

The bulk of the sample errors (74% across the UK) are related to missing or incorrect details on the sample bottles. The relatively high percentage of missing details in Wales may well be due to the extra requirement for the first line of the patient's address as an identifier, and also the resulting design of the sample labels, meaning it is easy to 'follow down' the boxes round the sample tube but miss those that are adjacent.

The use of 'addressograph' labels, or labels pre-printed away from the patient's side, continues to be a problem, despite recommendations in previous SHOT reports and BCSH guidelines. It must be emphasised that the misuse of pre-printed labels has implications for patient identification and subsequent care far beyond the boundaries of Blood Transfusion.

Who took the sample?

	UK		E & CI		W		NI		S	
Doctor	2711	*31%*	1959	*28%*	392	*46%*	196	*52%*	164	*38%*
Nurse	899	*10%*	790	*11%*	41	*5%*	24	*6%*	44	*10%*
Midwife	1261	*15%*	1046	*15%*	90	*10%*	63	*17%*	62	*14%*
HCA	60	*<1%*	52	*<1%*	7	*<1%*	0	*0%*	1	*<1%*
Phlebotomist	348	*4%*	327	*5%*	14	*2%*	2	*<1%*	5	*1%*
Not known	3254	*38%*	2694	*39%*	314	*37%*	91	*24%*	157	*36%*

It is of some concern that in the largest category of samples rejected by the laboratory, 38%, it is not known who performed the venepuncture and labelling of the sample. Where the person performing the venepuncture was recorded, the bulk of incorrect samples were taken by medical staff (31%), followed by midwives (15%) and nurses (10%).

Although at present there is a lack of denominator data regarding the overall breakdown of who bleeds patients for transfusion samples, it is felt that the proportion of medical staff involved in the errors is high.

Where were the samples from?

	UK		E & CI		W		NI		S	
Emergency Dept	1604	*19%*	1317	*19%*	204	*24%*	30	*8%*	53	*12%*
EMAU	349	*4%*	271	*4%*	59	*7%*	6	*2%*	13	*3%*
ITU / HDU	263	*3%*	187	*3%*	33	*4%*	17	*5%*	26	*6%*
Pre-op clinic	537	*6%*	469	*7%*	27	*3%*	19	*5%*	22	*5%*
Obs & Gynae	1589	*19%*	1254	*18%*	152	*18%*	98	*26%*	85	*20%*
Neonatal	72	*<1%*	58	*<1%*	5	*<1%*	6	*2%*	3	*<1%*
Paediatric	223	*3%*	164	*2%*	22	*3%*	25	*7%*	12	*3%*
Ward	2576	*30%*	2028	*30%*	246	*29%*	156	*41%*	146	*34%*
GP / Community	1127	*13%*	991	*14%*	66	*8%*	5	*1%*	65	*15%*
Not known	195	*2%*	129	*2%*	44	*5%*	14	*4%*	8	*2%*

While it may appear from these data that general wards (30%), emergency departments (19%) and obstetrics & gynaecology (19%) seem to generate more that their fair share of sample errors the numbers probably just reflect the high volume of group & save samples received from these clinical areas.

What time of day did the samples arrive?

	UK		E & CI		W		NI		S	
Core Hours	6210	*73%*	5061	*74%*	535	*62%*	272	*72%*	342	*79%*
Non-core Hours	2325	*27%*	1807	*26%*	323	*38%*	104	*28%*	91	*21%*

The definition of 'core hours' was left to the individual hospital to decide, as there is so much variation in exact hours worked across the country. SHOT has a working definition of 'core hours' as 08.00–20.00 Monday–Friday.

Across the UK, 27% of the rejected samples were recorded as arriving out of core hours, and this compares well with previous estimates of between 24–40% errors occurring out of hours as reported by SHOT from 1998–2004.

Phase 2 pilot study

This was carried out over a period of six months, from 1st September 2008 to 28th February 2009. Reporters were asked to submit cases where sample errors were detected after passing the initial barrier to rejection at the booking-in stage. Reports were made via SABRE as 'SHOT-only' notifications, and in response the SHOT Office sent a paper questionnaire to complete and return for analysis.

What was the error?	Details incorrect on the right sample			At what point was the error detected?	After booking in but prior to testing	
	Wrong Blood In Tube (WBIT)				During testing / selection of product / component	
Had the sample been relabelled?	Yes				At authorisation of results	
	No – zero-tolerance policy in place				On labelling the product / component	
Who took the sample?	Doctor	FY1			On collection of the product / component	
		FY2			At pre-administration checking	
		STR / Cons		Who detected the error?	MLA	
	Nurse	Student			Transfusion BMS	
		Staff Nurse			Other BMS	
		Sister/Charge Nurse			Nurse	
	Midwife				Porter	
	Health Care Assistant				Other (specify)	
	Phlebotomist			Is there a policy/SOP in place to prevent this type of error occurring?	No / Yes	
	Other				If yes, brief description of policy:	

What time was it taken?	08.01–16.00		How exactly was the error noticed?	
	16.01–20.00			
	20.01 - 08.00			
Where was the sample taken?	A/E Department		Was it detected by chance, or as a result of following protocols / QMS barriers to error?	
	Medical Admissions Unit			
	ICU / HDU			
	Women's & Children's			
	Paediatrics / Neonatal		Any further comments or information you may wish to supply:	
	GP practice			
	Ward (specify specialty)			
What was the request?	Group & Screen			
	Antenatal Group & Screen			
	Crossmatch / component issue			
Was it urgent?	Urgent			
	Routine			

On receipt of a notification report, 296 questionnaires were sent out. Of these, 220 completed questionnaires were returned either electronically or as paper reports, giving a return rate of 74.3%.

Subsequently, 6 questionnaires were withdrawn, leaving 214 for analysis.

What was the error?

Details incorrect on the right sample	**123**	*57.5%*
Wrong Blood In Tube (WBIT)	**90**	*42%*
Not known or no response	**1**	*0.5%*

Who took the sample?

Doctor	FY1	**38**	*18%*
	FY2	**47**	*22%*
	STR / Cons	**12**	*5%*
Nurse	Student	**0**	*0*
	Staff Nurse	**25**	*12%*
	Sister/Charge Nurse	**4**	*2%*
Midwife		**31**	*15%*
Health Care Assistant		**4**	*2%*
Phlebotomist		**22**	*10%*
Other		**25**	*11%*
Not known or no response		**6**	*3%*

What time was it taken?

08.01–16.00	**130**	61%
16.01–20.00	**32**	15%
20.01–08.00	**42**	20%
Not known or no response	**10**	4%

What was the request?

Group & Screen	**150**	70%
Antenatal Group & Screen	**19**	9%
Crossmatch / component issue	**45**	21%
Not known or no response	**0**	0

Was it urgent?

Urgent	**35**	16%
Routine	**173**	81%
Not known or no response	**6**	3%

At what point was the error detected?

After booking in but prior to testing	**44**	20.5%
During testing / selection of product / component	**66**	31%
At authorisation of results	**86**	40%
On labelling the product / component	**1**	0.5%
On collection of the product / component	**1**	0.5%
At pre-administration checking	**5**	2.5%
Not known or no response	**11**	5%

Who detected the error?

MLA	**10**	4%
Transfusion BMS	**159**	74.5%
Other BMS	**27**	13%
Nurse	**5**	2.5%
Porter	**0**	0
Other	**11**	5%
Not known or no response	**2**	1%

Was there a policy or SOP in place to prevent this type of error occurring?

All respondents indicated that there were organisational policies in place, based on national guidance, which covered sample taking and labelling. The sample taking process was covered mainly in the Trust transfusion policy, although many reporters had a separate venepuncture policy as well.

How was the error detected?

Of the 123 errors where the samples were from the correct patient, but where there were labelling errors that had been missed at booking in, 4 were detected at bedside administration of blood components, when it was realised that identification details were discrepant.

The other 119 errors were detected by the quality management system in the transfusion laboratory, where SOPs defined check procedures including:

- checking sample details against worksheets prior to testing on analysers
- checking sample details against worksheets prior to compatibility testing
- checking sample details against completed worksheets prior to authorisation of compatibility testing
- checking sample details against worksheets prior to authorisation of grouping results.

Of the 90 errors classified as 'Wrong Blood in Tube':

- 74 were detected because there was a discrepancy between blood group for the current sample and a historical group on the LIMS.
- 8 were detected because the person taking the sample realised that they had made an error and contacted the laboratory to inform them of this fact.
- 5 were detected because the clinical area were expecting either blood results or blood components for a particular patient, but were informed that results or components were available on a different patient (see Case 3 below).
- 2 were detected by alert BMSs who realised there was something unusual about the requests (see cases 1 and 2 below).
- 1 error was detected because a patient demanded to know why he had been bled twice in one day for a Group & Save request.

Case 1

Duplicate samples alert BMS to possible mix-up

The duty transfusion BMS working out of core hours noted that a second set of samples had been sent for the same patient in a very short space of time. On questioning the requesting doctor, it became apparent that the samples had been taken from a completely different patient, but labelled with the first patient's details. The samples were discarded prior to testing.

Case 2

Samples and requests on deceased patient alert BMS to error

A transfusion sample and request for blood components were received in the laboratory, where the duty BMS recognised the patient as having died in theatre some hours ago. On challenging the requesting doctor, it transpired that the sample had been taken from a different patient, but labelled using the deceased patient's notes.

Case 3

Unduly rapid G&S results alert clinicians to error

A group & save request was booked in routinely. The patient was new to the laboratory, and there were no discrepancies apparent on either the sample or the request form. The clinical team looking after the patient noted that a blood grouping result was available on the Trust electronic results reporting system and telephoned the laboratory to highlight that no grouping sample had yet been taken from this patient. The true identity of the sample was never established.

COMMENTARY

Near Miss events have long been recognised as a good indicator of strengths and weaknesses within the transfusion process. Near Misses often have the same root cause as actual transfusion accidents, but their relatively higher frequency allows systems to be analysed in more detail and deficiencies corrected before accidents occur.

The potential for an error to have a serious consequence depends on many factors, including the effectiveness of checks or barriers built into the process. Earlier SHOT annual reports have demonstrated that in many instances several errors may contribute to a 'wrong blood' event, and minor errors that evade the checks and barriers may play a significant part in a serious outcome for the patient.

Previous SHOT data have shown that around 50% of all Near Miss events, where an incorrect component was recognised before transfusion took place, occur at the sampling stage.

In phase 2 of the pilot study, 123/214 (57.5%) reports were of identification errors on correct samples that were missed at the sample receipt stage but detected on testing or checking within the laboratory. Actual WBIT errors accounted for a smaller number, 90/214 (42%), of errors. Of these, 76% of errors involve samples taken within core working hours, with 20% identified as arriving out of hours.

As in previous reports, the sample errors detected after acceptance for testing originate predominantly with medical staff (45%), but also with midwives (15%), nurses (14%) and phlebotomists (10%). The percentage of sample errors attributed to medical staff seems disproportionately high, and it would be interesting to obtain denominator data as to what proportion of all samples are taken by which group of staff. This would, however, be an intensive and difficult data gathering exercise, and until it is completed it may be enough to note that the figures obtained are comparable with previous SHOT annual reports. This emphasises the need for training as well as adherence to policies for venepuncture and sample labelling for all staff groups including doctors.

It is pleasing to see that check procedures put in place as part of the laboratory Quality Management System have been successful in screening out some of these errors, and there have been some examples of good laboratory practice in identifying 'out of the ordinary' requests that uncovered serious errors.

The importance of a clean, accurate transfusion database is highlighted by 74/90 WBIT errors being detected by comparison with historical data. If patients have never been grouped before, then there is a much higher likelihood that the errors will get through the system undetected, with the potential to cause death or major morbidity if components are issued on the basis of an incorrect blood group.

Local analysis of the origin/root cause of these Near Miss errors should be conducted against the background of competency assessment for clinical staff undertaking venepuncture, but what is apparent is a persistent failure to adhere to national and local policy regarding patient identification procedures.

The development of the new SHOT database later this year should facilitate the reporting and analysis of the whole range of Near Miss events, including WBIT errors, component selection and handling errors, collection and pre-administration errors.