2023 Annual SHOT Report – Supplementary information

Chapter 16: Errors Related to Information Technology (IT)

Additional case studies and data tables not included in the main 2023 Annual SHOT Report.

Flags, alerts and warnings

Case 16.2: Staff inexperienced in use of a newly implemented electronic blood management system (EBMS)

Nurses undertaking an electronic pre-administration check received a warning message that a unit of red cells was 'not recognised.' There was a back-up protocol in place to revert to the two-person independent check using paper documentation, but this was not followed. The laboratory was consulted and advised that the unit was returned, and a replacement was issued. This was successfully scanned, and safely administered without any further warning messages. Investigation demonstrated that clinical staff were unfamiliar with which barcode on the unit to scan and the initial error message had not clearly indicated this.

Case 16.3: Crossmatched blood could not be collected while the remote electronic issue (REI) system was updating

A member of clinical staff, who was fully trained and competent at using the EBMS, clicked 'blood products out' on the blood kiosk and entered the patient's details. An error message appeared indicating a problem retrieving the units assigned to this patient stating, 'Please try again, or contact support for assistance'. The alert was acknowledged, but to avoid delay, emergency blood was collected instead of the assigned units. Investigation identified that, at the time of the attempted collection, the laboratory had just issued two further units of red cells which were being transferred into the REI system, so the patient's record was updating. Therefore, the kiosk would not allow the already issued blood to be collected. The error message advice was specific and, had an attempt been made to collect the blood again the system would have allowed the blood that was issued and labelled for the patient to be removed.

Case 16.4: Error message misunderstood, and expired blood transfused

The ward staff administering blood to an unwell patient who needed an urgent transfusion got the error message 'dereservation' from the EBMS and reverted to a manual independent two-person check, which was the contingency for system downtime. Neither noticed the 'use by' time on the blood bag tag and it was transfused beyond its expiry. There had already been a delay in collecting

the blood and there was no written or verbal communication from the laboratory indicating the unit was close to expiry. There had been repeated error messages from the EBMS, so the clinical staff concluded that the system was not working as expected and went straight to the downtime procedure. There was already a degree of 'alert fatigue' and the error message was not understood at the bedside to mean that the unit had expired.

Interoperable IT systems

Case 16.5: Two different medical record numbers in use across hospital sites

A sample and request for red cells was sent to the transfusion laboratory from another hospital site. Two units were crossmatched using the hospital number from the main hospital site and transported to the theatre refrigerator. When the member of staff came to collect the first unit the EBMS system said there was no blood available for the patient but, using the 'emergency access' facility, blood was located and found to have correct identifiers except for the hospital number. There was a shared laboratory information management system (LIMS) across these two hospital sites which used a site-specific hospital number as the unique identifier. The NHS number was included in the patient's record for information only. The LIMS is due for replacement which may present an opportunity to resolve this lack of interoperability.

IT system and other equipment failure

Case 16.6: IT server failure causes multiple operational issues

There was a failure of the power supply to multiple servers because the uninterruptable power supply had been set up in a way which was not in accordance with the design and undermined the resilience built into the system. This caused multiple systems to fail including the EBMS and REI refrigerator resulting in potential delay to transfusion of a bleeding patient and avoidable use of emergency blood. There were additional IT-related communication issues because the bleep system was down, and it was difficult to get specific help and advice on transfusion issues without access to a telephone directory. Had they been in contact with the laboratory, theatre staff would have known that fully crossmatched units were available for the patient.

Case 16.7: Communication of the back-up procedures during planned downtime

During a planned IT downtime which affected the EBMS a patient in theatres was given emergency blood taken from a CREDOð box instead of the crossmatched blood that was available in the laboratory. Despite organisation-wide communications supplemented by individual emails to anaesthetists working on the day there was still lack of clarity about the arrangements. There was a review of the downtime arrangements including consideration of a standard blood refrigerator with keycode access and a manual register as back up in future.

Case 16.8: Loss of data from a temperature probe

A temperature-monitoring system required upgrading. There was a failure to force a data back-up before the system was taken offline for maintenance, so data appeared to have been lost since the last back-up which was scheduled every 24 hours. The external provider of this monitoring system did not consider the implications of the timing of the maintenance/upgrade although the need for an uninterrupted cold-chain record had been highlighted by the hospital laboratory and quality managers. The missing data was eventually fully retrieved and there had been no temperature excursions therefore no risk to the blood supply. Both parties undertook to take this into consideration when planning for future works.

Table 16.3: Answers to IT-related questions (n=541)

Category	Right blood	Wrong blood	Wrong blood HSCT/ SOT	Not irradiated	Not antigen matched/ pheno-typed	Not CMV tested	Sample or unit expired/ OOT control	Not HLA-matched	MISC HSE/right blood/ too fast	ADU	Totals
	87	45	34	53	85	8	100	3	57	69	541
Question: Did IT contribute to the error?											
YES	30	16	10	15	28	2	19	2	-	34	156
NO	56	29	21	38	57	6	81	1	54	34	377
BLANK	1	-	3	-	-	-	-	-	1	1	8
Question Could the error have been prevented by IT?											
YES	35	27	16	28	41	4	39	2	-	30	222
NO	47	16	15	25	39	4	58	1	4	32	241
BLANK	5	2	3	-	5	-	3	-	53	7	78

Table 16.4: Classification of IT-related error reports (n=541)

Category	Right blood	Wrong blood	Wrong blood HSCT/ SOT	Not irradiated	Not antigen matched/ pheno-typed	Not CMV tested	Sample or unit expired/ OOT control	Not HLA-matched	MISC HSE/right blood/ too fast	ADU	Total
Total cases	**87**	**45**	**34**	**53**	**85**	**8**	**100**	**3**	**57**	**69**	**541**
Flags alerts and warnings n=194											
Failure to use flags or logic rules	-	11	14	8	25	--	11	2	-	1	**72**
Warning flag not updated or removed in error	1	2	5	23	18	5	-	1	-	1	**56**
Warning flag in place but not heeded	7	7	13	2	17	1	17	-	-	2	**66**
Discrepancies n=55											
Blood issued against wrong patient ID	5	-	-	-	-	-			-	-	**5**
Discrepancy between LIMS and PAS/EPR	18	-	-	-	-	-			-	-	**18**
Failure to link, merge or reconcile computer records	4	-	1	9	9	-			-	1	**24**
Failure to consult or identify historical record	-		-	3	4	-			-	1	**8**

Category	Right blood	Wrong blood	Wrong blood HSCT/ SOT	Not irradiated	Not antigen matched/ pheno-typed	Not CMV tested	Sample or unit expired/ OOT control	Not HLA matched	MISC HSE/right blood/too fast	ADU	Total
Errors n=98											
Errors related to computer system	2	1	-	1	5	2	2		-	10	**23**
Errors related to EBMS	9	7	-	-	1	-	18		1	8	**44**
Incorrect result or data entered manually	10	6	1	-	3	-	3		-	1	**24**
Wrong record selected on LIMS or PAS	6	1	-	-	-	-			-	-	**7**
Technology or equipment failure n=130											
Computer or other IT systems failure	5	3	-	-	1		2		-	12	**23**
Other equipment failure	3	1	-	-	1		29		54	19	**107**
IT systems as CAPA n=64											
IT system as corrective or preventative action	17	6	-	7	1	-	18	-	2	13	**64**