

## Annual SHOT Report 2018 – Supplementary information

### Chapter 15: Errors Related to Information Technology

#### IT-related Anti-D Ig cases n=12

There were 12 cases where IT errors played a part in incorrect anti-D Ig administration.

#### Anti-D Ig given unnecessarily n=6

In 3 cases the women had an anomalous D group, which should have been managed as D-positive. In the first case the D-group had already been resolved but there was insufficient patient ID to merge two Specialist Services electronic reporting using Sunquest's Integrated Clinical Environment (Sp-ICE) records. In a 2<sup>nd</sup> case the Blood Service reference laboratory result was available but was not accessed so the wrong advice was given. In a 3<sup>rd</sup> case, pending the results of the investigation, the D-group defaulted to D-negative. The resolved D-group was not uploaded and acted on in a timely way. The corrective action for this error was to create a laboratory information management system (LIMS) orderset to identify a pending result and prompt quicker and more timely follow-up.

In 1 case the result of a cffDNA predicted fetus to be D-negative but the alert which stated 'Note: the fetus is rhesus negative. Are you sure anti-D is needed?' was ignored.

#### Case 7.11: Wrong calculation of FMH using the LIMS

*A D-negative woman was given four times the required dose of anti-D Ig because of a miscalculation of the fetomaternal haemorrhage post delivery. The LIMS is able to calculate the volume of fetal red cells from the Kleihauer result but the results of the cell count had to be entered manually. A member of staff returning from prolonged leave had not done the competency for this procedure and the standard operating procedure (SOP) was unclear. 3000IU anti-D Ig was given when 500IU would have been sufficient.*

#### Case 7.12: Negative antibody screen misread as D-negative

*A woman attended for routine 28-week antenatal appointment and had samples taken for group and screen. The midwife looked up the blood group from the booking appointment to see if anti-D Ig was required and misread 'antibody screen: negative' as 'D-negative' and gave an injection of anti-D Ig. This error was identified when the paperwork was reviewed and the blood group was D-positive.*

#### Delayed anti-D Ig administration n=2

In 1 case the act of booking in a group and screen to the LIMS overrode the request for a Kleihauer so anti-D Ig was issued late for a PSE. Another delay occurred because the D-group in the maternity electronic record was incorrect due to a manual transcription error.

#### Right product, right patient n=4

Manual transcription of anti-D Ig batch numbers onto the LIMS was subject to an error in 2 cases. The wrong record was selected on the LIMS in another case, and the LIMS allowed issue of anti-D without a current group in the final case.

## **IT-related IBCT cases n=125**

### **IBCT-WCT n=24**

Of the 24 WCT IT-related errors, 17 were in the laboratory area, and 7 in the clinical area.

Of the 24 incorrect blood components transfused related to IT errors, 16 were in HSCT patients and two in solid organ transplant patients. The IT errors related to the laboratory were largely due to the failure of flags, alerts and warnings but also because information about the transplant had not been communicated to the laboratory. In 8 cases there was a flag to denote the ABO requirement of blood components in ABOi HSCT, but these were not heeded and in another 8 the flags were not updated to reflect the change in requirements.

### **IBCT-SRNM n=101**

Of the 101 SRNM IT-related errors, 60 arose in the laboratory and 41 in the clinical area.

A large proportion of errors resulted in the correct phenotype match not being selected (27 cases). Ten of these were due to failure to consult the historical record and 1 due to failure to link or merge records. In 2 cases the information that could have enabled the correct phenotype of red cells was on Sp-ICE. In 12 cases flags were either not heeded (4) or not updated (5) or flags were not used (3).

There were 51 cases where irradiated blood was required but not provided. In 25 cases there was a failure to heed (4) or update (21) the LIMS warning flag and a further 16 where the flag was not used.

## **IT-related HSE cases n=23**

Of the 23 cases, 12 related to cold chain management, 2 were due to expired blood components, 3 due to sample validity and 2 due to duration of the transfusion. There were 2 labelling errors and 2 miscellaneous handling and storage errors.

### **Case 9.4: Transfusion started despite the two blood-tracking alerts**

*A unit of blood was removed from the issue refrigerator just after midnight. An alert appeared on the kiosk explaining the unit had expired and to contact the laboratory. The on call BMS incorrectly assumed the alert was related to an earlier network failure and allowed the unit to be taken to the ward. A second alert occurred on the PDA again explaining the unit had expired and not to continue. But the transfusion went ahead. Within a few minutes the on call BMS looked into the alerts further and realised the error, recommending the transfusion be stopped and the blood returned to the laboratory.*

### **Case 9.5: Malfunctioning infusion pump results in slow transfusion**

*A haematology patient was prescribed a routine red cell transfusion over 2 hours. And the infusion device was set at 150mL/hour. When the staff member returned, the rate of transfusion had changed to 75 mL/hour. The machine displayed a warning symbol next to the rate. However, the rate had not been changed by a staff member. This event was attributed to an infusion device malfunction, which is still under investigation by the hospital and the manufacturer.*

## IT-related ADU cases n=18

There were 12 blood delays, 5 avoidable transfusions, which included 2 inappropriate uses of emergency O D-negative blood, 1 wrong result accessed and 1 error in the electronic prescribing system. Finally, there was 1 report involving overtransfusion. These reports can be linked to IT or other equipment problems.

### Errors related to electronic blood management systems n=3

There were 2 delays, and 1 avoidable transfusion.

#### Case 10a.16: Satellite blood refrigerator would not release paediatric emergency O D-negative blood

*A mother with a massive third-trimester antepartum haemorrhage, was transfused all the adult emergency blood from a tracked satellite refrigerator. When her baby was born by emergency caesarian section and also needed urgent transfusion, the paediatric emergency blood in the same refrigerator could not be accessed. A problem with the system meant that it was not registering any emergency units (adult or paediatric) and would not release the locked door. A solution has been found and implemented to avoid this situation occurring again and further review is ongoing.*

In another case there were problems with bedside-tracking because the patient had 'unknown' gender instead of 'male' on the wristband. This prevented blood being administered with the bedside PDA and resulted in a blood delay. In a further case, an MLA put the blood in the wrong satellite refrigerator. The hospital did not have blood-tracking in place and there was delay to transfusion although the blood was eventually located.

### Failure of equipment n=4

There were 2 blood delays due to the porter's bleep failing in the context of a bleeding emergency. When a satellite refrigerator was out of use the message did not get through to all staff in theatre and there was delay to an emergency transfusion as a result of this. A glitch with the transfusion LIMS was known to result in frequent duplicate printed copies of the compatibility paperwork. Unfortunately blood was provided to a trauma patient without the necessary paperwork because it was still sitting on the printer as an assumed duplicate.

### Errors related to LIMS downtime n=4

There were 4 episodes of IT downtime that caused blood delays. Although 2 of these were planned, emergency blood was used unnecessarily when the patients could have waited or had crossmatched blood. In another 2 episodes of unplanned downtime delays to routine transfusions were reported.

### Errors related to interoperable systems n=2

There was a reported blood delay because of incorrectly merged/linked records when upgrading the LIMS and in another situation, failure to have interoperable systems resulted in 2 different patients ID which caused clinically significant delay.

**Blood delays due to LIMS configuration n=2**

These 2 errors occurred with a LIMS that had been configured to default to the current sample as soon as it had been booked in rather than when the group and screen result was available. On both occasions the current sample had been rejected – one because it was an unnecessary group check sample and the other because it had probably been misidentified. On both occasions, patients who were otherwise eligible for EI had to have a serological crossmatch whilst the prevention of EI by the system was investigated.

## **IT-related RBRP cases n=35**

There were 35 cases where there were IT errors that led to blood transfusion of the right blood to the right patients but with an error in the patient's ID. For 18 of these the error was the wrong name, 5 the wrong date of birth and 5 the wrong unique patient number. In 2 cases multiple details were wrong.

### **Historical or duplicate records n=4**

In 1 case the historical record had not been identified or consulted and in 3 cases the wrong record had been selected on the LIMS or patient administration system (PAS).

### **Manual transcription n=26**

There were 10 RBRP errors due to incorrect data being entered or accessed manually on the LIMS, in 11 cases there was a discrepancy between the LIMS and the PAS. In 5 cases blood was issued against the wrong patient ID manually entered from the sample or request form.

### **Problems with electronic blood management systems n=3**

In 1 case with a major haemorrhage patient was not wearing a wristband so it could not be scanned with a bedside tracking system – but the blood was given anyway. In another case blood was collected from a remote electronic issue refrigerator despite there being an error in the date of birth.

#### **Case 13.3: Expired mandatory training blocks access to electronic blood management system**

*As is intended, staff members who do not keep up-to-date with mandatory transfusion education can be blocked from using electronic blood management systems. When staff members had their access revoked they continued to transfuse patients without any electronic bedside checks.*

#### **Case 13.4: Nurse followed incorrect process and did not print a label for remote electronic issue**

*A remote electronic issue system was in operation on a site with a haematology/oncology day ward. A nurse who had been trained to use the system obtained blood for an elective day-case transfusion by using the emergency button to access the refrigerator then, using a blood group and antibody screen result, selected a unit of blood of the same blood group as the patient and transfused it without printing out any compatibility labels.*

### **Warning not heeded n=1**

In this case a PDA alerted the nursing staff to a discrepancy with the patients' name, which had the first and last names transposed. This alert was ignored and the blood transfused anyway.

### **Printing error n=1**

A transfusion record sheet contained a label where only the patient name was legible, with the other patient identifiers not being printed clearly. The transfusion took place without proper positive patient identification.

**Table 15.2: Summary of errors related to information technology**

Error	Total reports	Right blood	Wrong blood	Unit transfused when special requirements not met					Wrong group HSCT/SOT	Handling and storage errors	Avoidable or delayed
				Not irradiated	Not CMV/not PAS <sup>1</sup>	Not MB/VIP	Ag positive unit/not phenotyped	HLA-matched			
Failure to consult or identify historical record	21	1		7			12		1		
Failure to link, merge or reconcile computer records	7		1	3		1	1				1
Wrong record selected on LIMS or PAS <sup>2</sup>	3	3									
Warning flag in place but not heeded	29	1		4	2	6	4	2	8	2	
Warning flag not updated	38			21	1		5	1	10		
Failure to use flags and/or logic rules	31		2	16		8	3	1	1		
Computer or other IT systems failure	12		1		1				1	4	5
Errors related to computer system	3										3
Errors related to electronic blood management system	10	3	1							3	3
Other equipment failure	18	1								14	3
Incorrect result or data entered or accessed manually	11	10									1
Discrepancy between LIMS and PAS <sup>2</sup>	13	11									2
Blood issued against wrong patient ID (sample or request form)	5	5									
EI cases (DOUBLE COUNTED)	(18)	(2)					(11)		(5)		
<b>Total</b>	<b>201</b>	<b>35</b>	<b>5</b>	<b>51</b>	<b>4</b>	<b>15</b>	<b>25</b>	<b>4</b>	<b>21</b>	<b>23</b>	<b>18</b>

CMV=cytomegalovirus; PAS<sup>1</sup>=platelets in additive solution; MB=methylene-blue; VIP=virally inactivated plasma; HLA=human leucocyte antigen; HEV=hepatitis E virus; HSCT=haemopoietic stem cell transplant; SOT=solid organ transplant; PAS<sup>2</sup>=patient administration system; ID=identification; OBOS=online blood ordering system; EI=electronic issue