Annual SHOT Report 2013 – Supplementary Information

Chapter 9: Events Originating in the Hospital Transfusion Laboratory

A summary of all Laboratory cases, as shown on Table 9.1 within the Laboratory chapter in the 2013 Annual SHOT Report are detailed below.

Table 9.1: Laboratory errors n=284

Laboratory categories	Total	Percentage	Chapter					
			IBCT	SRNM	HSE	RBRP	ANTI-D	ADU
Sample receipt and registration	84	29.6%	4	16	8	35	21	0
Testing	51	18.0%	8	19	0	0	18	6
Component selection	36	12.6%	9	19	0	1	7	0
Component labelling, availability, handling and storage	104	36.6%	3	0	43	48	9	1
Miscellaneous	9	3.2%	0	2	0	0	0	7
Total	**284**	**100%**	**24**	**56**	**51**	**84**	**55**	**14**

Sample receipt and registration n=84

RBRP cases n=35

In 35/84 (41.7%) reports patients received the correct component but had one or more patient demographic data entry errors made when 'booking in'. These included errors in

Table 9.3: Sample receipt and resgistration RBRP errors n=35

Demograhic data entry error	Number of reports
Patient's name	15
Date of birth (DOB)	10
Hospital number	8
Sample number	1
Address	1
Total	**35**

Anti-D cases n=21

In 21/84 (25.0%) reports anti-D immunoglobulin (Ig) was inappropriately issued despite the availability of historic information.

Table 9.10: Sample receipt and resgistration Anti-D errors n=21

Error	Number of reports
Women of childbearing potential who had known immune anti-D	14
RhD negative women that delivered an RhD negative infant	4
Women known to be RhD positive	3
Total	**21**

SRNM cases n=16

In 16/84 (19.0%) reports patients were transfused components that did not meet their specific requirements.

Table 9.11: Sample receipt and resgistration SRNM errors n=16

Error	Number of reports
Irradiated	7
Requirements on patient's historical record missed/not heeded for patients with known alloantibodies	6
RhD/K matched and HbS negative for sickle patient	2
Irradiated and cytomegalovirus virus (CMV) negative	1
Total	**16**

Case 5: A failure to consult historical records results in patient with multiple antibodies receiving a red cell transfusion of incorrect phenotype

A patient was transfused two red cell units that had been electronically issued. When a further request was received by the laboratory it was noted the patient had historical data indicating the patient had previously detected (2002) anti-K, anti-Jka and anti-Kpa. The patient had received red cell transfusions on two occasions (2007 and 2013) that were not of the correct phenotype due to a failure to consult historical records.

HSE cases n=8

In 8/84 (9.5%) reports, patients were transfused following compatibility testing using samples that had exceeded BCSH sample timing guidelines.

IBCT cases n=4

In 4/84 (4.8%) reports patients were transfused an incorrect blood component despite the availability of historical information indicating that the patients were Haemopoietic Stem Cell Transplant (HSCT) recipients.

Table 9.12: Sample receipt and resgistration IBCT errors n=4

Error	Number of reports
Incorrect ABO to known HSCT patients	2
Rh mismatch to known HSCT patients	2
Total	**4**

Testing n=51

SRNM cases n=19

In 19/51 (37.2%) reports laboratory testing errors resulted in a failure to meet patient's specific requirements. Most of the cases were failure to follow procedures.

Table 9.13: Testing SRNM errors n=19

Error	Number of reports
Inappropriate use of electronic issue when patient had a positive direct antiglobulin test (DAT) (2) manually edited results (2) patient had received a solid organ transplant within the past 3 months (1)	5
Antibody identification not performed following a positive antibody screen	4
misinterpretation of antibody identification results	4
Red cells issued and transfused before crossmatch results had been confirmed	2
Red cells not crossmatched against the maternal sample which contained multiple alloantibodies transfused to neonate	1
Antibody screen not performed	1
Non–HLA matched platelets transfused due to failure to input available HLA results	1
misinterpretation of phenotype results	1
Total	**19**

Anti-D cases n=18

In 18/51 (35.3%) reports laboratory testing errors resulted in omission, late or inappropriate administration of anti-D Ig to women of childbearing potential.

Table 9.14: Testing Anti-D errors n=18

Error	Number of reports
Cord samples tested post delivery incorrectly reported as RhD positive resulting in inappropriate administration of anti-D Ig	6
Omission or late administration of anti-D Ig because Kleihauer test: a) not performed within 72 hours post delivery b) performed within 72 hours but not administered within 72 hours (see Case 2 in the main report)	6
Inappropriate administration of anti-D Ig to an RhD positive woman due to interpretation errror	2
Inappropriate administration of anti-D Ig to a woman with immune anti-D due to interpretation errror	1
Inappropriate administration of anti-D Ig to a weak D positive woman due to interpretation errror	1
anti-D Ig administered inappropriately as a result incorrect estimation of FMH by Kleihauer	1
Anti-D Ig inappropriately administered to women who had delivered an RhD negative infant as the cord RhD status was not looked up and it was assumed to be RhD positive	1
Total	**18**

IBCT cases n=8

In 8/51 (15.7%) reports laboratory testing errors resulted in the transfusion of an incorrect blood component.

Table 9.15: Testing IBCT errors n=8

Error	Number of reports
Group and antibody screen not performed prior to issue of crossmatched red cells	2
ABO grouping error	2
RhD grouping error	1
Red cells issued and transfused before crossmatch results had been confirmed	1
Inappropriate use of electronic issue - patient had received a solid organ transplant	1
No grouping reagents added to manual ABO tube group	1
Total	**8**

ADU cases n=6

In 6/51 (11.8%) laboratory testing errors resulted in unnecessary transfusions.

Table 9.16: Testing ADU errors n=6

Error	Number of reports
Erroneous low platelet counts that were reported for patients whose platelets were known to 'clump' in Ethylenediaminetetraacetic acid (EDTA)	4
Erroneous full blood count based on 'clotted' sample	1
Erroneous abnormal clotting results were reported on a sample suspected to have clotted prior to testing and a repeat test showed normal results	1
Total	**6**

Component selection n=36

SRNM cases n=19

In 19/36 (52.8%) component selection errors resulted in a failure to meet patient's specific requirements, when the correct specification was available.

Table 9.16: Component selection SRNM errors n=19

Error	Number of reports
K negative red cells not selected for women of child bearing potential	7
MB fresh frozen plasma (FFP) not selected for patient born after 1st January 1996	6
MB cryoprecipitate not selected for patient born after 1st January 1996.	1
Rh phenotype (E neg) not matched for Sickle patient	1
Fyb negative selected instead of Jkb negative	1
Irradiated available but not selected	1
Apheresis platelets available but not selected	1
Dose of adult platelets issued to a neonate	1
Total	**19**

Case 6: Multiple specific requirements and one missed

A patient with Sickle Cell Disease (SCD) received a red cell transfusion that did not meet all of the patient's specific requirements.
The patient was B RhD positive, E and K negative. Six red cell units were transfused that were not E negative but the other specific requirement for a patient with SCD were met including red cells less than 7 days old, K negative and Haemoglobin S negative.

IBCT cases n=9

In 9/36(25.0%) an incorrect blood component was transfused due to a component selection error.

Table 9.17: Component selection IBCT errors n=9

Error	Number of reports
Wrong ABO group selected for red cells	3
Cryodepleted selected when cryoprecipitate requested	2
Wrong ABO group selected for FFP	1
FFP selected when cryoprecipitate requested	1
Wrong unit for neonate	1
RhD mismatched red cells to a woman of child bearing potential	1
Total	**9**

Anti-D cases n=7

In 7/36 (19.4%) cases selection errors resulted in inappropriate administration of anti-D Ig.

Table 9.18: Component selection anti-D errors n=7

Error	Number of reports
RhD positive platelets given to women of child bearing age without Anti-D Ig cover.	5
Wrong dose anti-D Ig administered, Patient 1 was 13+3 weeks pregnant and BMS selected 500iu instead of 250iu and patient 2, 500 IU was selected for a post delivery patient when 1500IU should have been given	2
Total	**7**

RBRP cases n=1

In 1/36 (2.8%) cases where the right patient received the right blood despite one or more errors. In this case the laboratory staff issued FFP when platelets were requested. (The patient was due to receive FFP as well).

Component labelling, availability, handling and storage n=104

The majority of errors are component labelling 52/104 (50.0%), with availability contributing 42/104 (40.4%) and handling and storage errors 10/104 (9.6%)

RBRP cases n=48

In 48/104 (46.1%) cases a patient was transfused with the correct component despite component labelling errors:

Table 9.19: Component labelling, availability, handling and storage RBRP errors n=48

Error	Number of reports
Compatibility labels were transposed	42
No compatibility labels attached to component	3
Compatibility labels contained incorrect information	3
Total	**48**

HSE cases n=43

In 43/104 (41.3%) cases there were errors associated with handling and storage, which could have rendered the component unsafe to transfuse.

Table 9.20: Component labelling, availability, handling and storage HSE errors n=43

Error	Number of reports
Cold chain errors	29
Expired units transfused red cells (3) Platelets (3) Fresh Frozen Plasma (1) Octaplas® (1)	8
Sample exceeds sample timing guidelines	5
Incorrect expiry date added post irradiation process	1
Total	**43**

Case 7: Expired unit transfused as a result of laboratory staff overriding warning message on electronic tracking system

Laboratory staff incorrectly interpreted a warning message on the electronic tracking system that was preventing them from issuing a unit of platelets. Assuming the system was not working correctly they manually removed the pack at 00:20 and the expiry date was midnight the day before. The ward staff noticed the platelets had expired during the bedside check and contacted the laboratory. They were assured by the laboratory staff that the pack was not "out of time". The conversation did not clarify that the ward were talking about the expiry date and the laboratory staff were talking about time since removal from temperature controlled storage. The ward staff accepted the laboratory confirmation that there were no issues with the pack and transfused the platelets at 00:40.

Case 8: A red cell unit was returned to stock when it should have been discarded

A unit of blood which had been out of temperature control for 159 minutes was returned to stock, then issued and transfused to another patient 25 hours later.

Anti-D cases n=9

In 9/104 (8.7%) cases there were errors relating to the labelling, availability, handling and storage of anti-D Ig.

Table 9.21: Component labelling, availability, handling and storage anti-D errors n=9

Error	Number of reports
Anti-D Ig erroneously not issued	5
Anti-D Ig erroneously returned to stock	2
1500 IU dose anti-D labelled as 500IU	1
An empty vial of anti-D Ig was issued	1
Total	**9**

IBCT cases n=3

In 3/104 (2.9%) errors relating to the labelling and availability of components resulted in the transfusion of an incorrect blood component.

Table 9.21: Component labelling, availability, handling and storage IBCT errors n=3

Error	Number of reports
Compatibility labels for two different patients transposed.	1
Solvent detergent fresh frozen plasma intended for one patient but labelled for a different patient	1
A BMS erroneously placed units they were crossmatching in the issues fridge and these were inadvertently collected when emergency O RhD negative units were required	1
Total	**3**

Case 9: Compatibility labels transposed as a result of labelling for two patients at the same time

Two platelet pools were receipted from NHSBT and issued via the LIMS to the correct patients. Both pools were labelled at the same time but the labels for the two patients transposed. This was not noticed during the bedside check and resulted in the first patient (Group O) receiving a transfusion of group A platelets labelled and intended for a different patient. The other unit had not been collected.

ADU case n=1

In 1/104 (1.0%) case a transfusion was delayed when the laboratory did not inform the clinical staff that the components were available for collection.

Miscellaneous n=9

The 9 miscellaneous cases comprise of 7 ADU and 2 SRNM.

ADU cases n=7

Table 9.22: Miscellaneous ADU errors n=7

Error	Number of reports
Delays caused by equipment failures were further compounded by inadequate communication between the laboratory and clinical teams	3
Delay caused by a lack of appreciation of clinical urgency when a consultant was called away from the resuscitation of a paediatric patient, at the insistence of the laboratory, to personally authorise the request	1
Surgery was delayed until a new sample had been received in the laboratory following an initial enquiry when theatre staff were incorrectly informed that the original sample sent to the laboratory pre operatively was invalid	1
Avoidable use of O negative due to a delay in referring samples to NHSBT for further investigation	1
Delay in performing additional tests to provide compatible units for a patient with a positive antibody screen	1
Total	**7**

SRNM cases n=2

In 2 cases laboratory errors contributed to a failure to meet patient's specific requirements.

Table 9.23: Miscellaneous SRNM errors n=2

Error	Number of reports
A biomedical scientist removed a special requirements flag indicating the patient required C negative red cells and the patient was consequently transfused two red cell units that were C positive	1
A patient with Sickle Cell Disease transferred care to a different hospital. The patient had historical clinically significant antibodies, anti-E and anti-S, and incomplete follow up with the transferring hospital resulted in the patient receiving two units of red cells that were not antigen negative	1
Total	**2**

Near miss laboratory errors n=251

Table 9.24: Categories of laboratory errors made

Near miss laboratory categories	Total	Percentage	Chapter					
			IBCT	SRNM	HSE	RBRP	ANTI-D	ADU
Sample receipt and registration	26	10.4%	6	7	0	10	3	0
Testing	32	12.7%	16	9	0	0	4	3
Component selection	61	24.3%	6	39	3	0	13	0
Component labelling, availability, handling and storage	131	52.2%	17	0	38	72	4	0
Other = LIMS bug, failed to detect group mismatch	1	0.4%	1	0	0	0	0	0
Total	**251**	**100%**	**46**	**55**	**41**	**82**	**24**	**3**

Sample registration and receipt n=26

Table 9.25: Sample receipt and registration errors

Sample receipt and registration errors	Number of cases	Percentage of cases
Incorrect identifiers entered onto LIMS	8	30.8%
Specific requirements not met (failure to notice information on the request form or the patient's historical record)	8	30.8%
Sample booked under incorrect record*	7	26.9%
Anti-D requests on known RhD positive patients	3	11.5%
Total	**26**	**100%**

** includes an incident where historical LIMS group was added to wrong patient in a replacement LIMS*

Testing n=32

Table 9.26: Testing errors

Testing errors	Number of cases	Percentage of cases
Incomplete testing	13	40.7%
Interpretation	9	28.1%
Transcription errors	5	15.6%
Manual grouping errors	4	12.5%
Repeatable incorrect sample group (not WBIT)	1	3.1%
Total	**32**	**100%**

Component selection n=61

Table 9.27: Component selection errors

Component requirement or specification missed	Number of cases	Percentage of cases
Irradiated	20	32.8%
Anti-D immunoglobulin errors	13	21.3%
Red cell phenotype	11	18.0%
Incorrect ABO or RhD type selected	5	8.2%
Cytomegalovirus (CMV) negative	4	6.6%
HLA matching	3	4.9%
Time expired component selected	3	4.9%
Incorrect component type selected	2	3.3%
Total	**61**	**100%**

Component labelling, availability, and handling and storage errors (HSE) n=131

Table 9.28: Component labelling, availability, and handling and storage errors (HSE)

Component errors	Number of cases	Percentage of cases
Component labels transposed	45	34.4%
Incorrect patient information on label	41	31.3%
Time expired component available	31	23.7%
Incorrect component sent to ward	7	5.3%
Exceeded BCSH (REF 1) sample timing guidelines	5	3.8%
Cold chain errors	2	1.5%
Total	**131**	**100%**

Summary of Events Originating in the Hospital Transfusion Laboratory - Previous Recommendations

Year first made	Action	Recommendation
2012	**Transfusion Laboratory Managers**	Regular practice and competency-assessment of manual techniques is important, where possible this should include checks of the critical steps by a second person when manual methods are employed
2012	**Transfusion Laboratory Managers**	Competency assessment in laboratories must be linked to process. Biomedical scientist (BMS) staff must be competent performing the test but must also have a thorough understanding of the context in which the test is being performed, i.e. the test in relation to a specific patient and the clinical information. Basing competency assessment on National Occupational Standards (NOS) will enable this, as NOS have both 'Performance' criteria and 'Knowledge and Understanding' criteria
2012	**Transfusion Laboratory Managers, Pathology IT Managers, LIMS providers, Hospital Transfusion teams (HTTs)**	Hospital Transfusion Teams (HTTs) should perform a local risk assessment on the way in which the transfusion laboratory is informed by clinicians of either specific requirements, or previous history provided by patients direct to clinicians. For example, having a robust process to inform the laboratory when treatment on purine analogues starts, rather than when blood is requested, has merit
2012	**Transfusion Laboratory Managers, Pathology IT Managers, LIMS providers, HTTs**	Warning flags must be clear and appear on all relevant screens in the transfusion process and if overridden, should include a positive response from the user with rational behind the decision
2012	**Hospital Transfusion Laboratory Managers; Pathology Managers**	Hospital transfusion laboratories should be encouraged to participate in the national electronic access scheme for blood group and antibody information which is being developed by National Health Service Blood & Transplant (NHSBT) (called Sp-ICE), and equivalent systems in Wales, Scotland and Northern Ireland for patients with complex transfusion requirements, and as recommended by National Patient Safety Agency (NPSA) safer practice notice, to use the NHS or number

2011	**Transfusion Laboratory Managers, Pathology IT managers, LIMS Providers**	As the specification of transfusion laboratory information management systems (LIMS) is further developed it is vital that: - As a minimum there is a requirement for positive confirmation, by the biomedical scientist (BMS), at the point of component reservation, that special requirements have been met - Preferably, a requirement for a direct check within the LIMS, that the component meets the special requirement on record - Warnings must be clear and appear on all relevant screens in the transfusion process - Warning flags need a positive response from the user as to why they are being overridden