Laboratory Errors n=796 (495 errors and 301 near miss)

14

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Key SHOT messages

- Many mistakes may be the result of distorted decision making or cognitive bias. Processes should be designed to account for these biases by drawing attention to safety critical steps
- Regular monitoring of quality system outputs is required. If omissions or inaccuracies are detected these require immediate corrective and preventative action (CAPA) to prevent potential patient harm
- Laboratory staff should be comfortable working within routine procedures – these procedures should be safe and fit for use, especially in high-pressure situations

Abbreviations used in this chapter

AAA	Abdominal aortic aneurysm
ABOi	ABO-incompatible
AML	Acute myeloid leukaemia
BMS	Biomedical scientist
BSQR	Blood Safety and Quality Regulations
CAPA	Corrective and preventative action
CL	Component labelling, availability and handling and storage
EQA	External quality assessment
FTSUG	Freedom to speak up guardian
HSE	Handling and storage errors
IBCT	Incorrect blood component transfused
IT	Information technology
LIMS	Laboratory information management systems
MHP	Major haemorrhage protocol
MHRA	Medicines and Healthcare products Regulatory Agency
QMS	Quality management system
RCA	Root cause analysis
SD-FFP	Solvent-detergent fresh frozen plasma
SOP	Standard operating procedure
SRNM	Specific requirements not met
SRR	Sample receipt and registration
UKAS	United Kingdom Accreditation Service
UKNEQAS	UK National External Quality Assessment Scheme
UKTLC	UK Transfusion Laboratory Collaborative

Recommendations

- Laboratory staff should have knowledge of the clinical requirements of transfusion to work collaboratively to deliver cohesive patient-centred care
- All lone workers should be adequately supported through their training and competency assessment to ensure they are equipped with adequate skills and knowledge. Laboratory management have a responsibility to ensure all staff members are competent before exposing them to lone working

- Escalation procedures for lone workers must be clear and defined, with specialist support being accessible at all times (UK Transfusion Laboratory Collaborative Standard 3.6)
- Laboratory information management systems (LIMS) should be robust and used to their full functionality, preventing ABO-incompatible (ABOi) units being assigned to the patient record, and thus issued, especially in an emergency when the patient's blood group is unknown

Action: Transfusion laboratory managers, transfusion practitioners, hospital transfusion teams

Introduction

The number of events reported by the laboratory accounts for 796/3397 (23.4%) of all accepted SHOT reports in 2019 and is a slight reduction on the 885/3326 (26.6%) reports in 2018. Almost half of all laboratory reports (373/796, 46.9%) involved component labelling, availability and handling and storage (CL) (Figure 14.3 and 14.5). Similar to clinical errors, laboratory errors have the potential to cause patient harm, and have caused patients to suffer major morbidity in 2019. The transfusion laboratory is in a unique position as it provides results which influence patient care, but also provides a therapeutic product for the patient, therefore when errors occur there is arguably greater potential impact on the patient. Transfusion laboratories may wish to use the 'Laboratory exit check' to ensure that errors which occur at this step are recognised before they have the opportunity to impact on patient safety (Figure 14.1).

It is also essential that the transfusion laboratory works cohesively with other pathology disciplines. Testing errors within haematology and coagulation continue to impact on transfusion safety, in particular cases of avoidable and undertransfusion. Where results are potentially spurious, these should not be made available to the clinical area as misinterpretation can lead to inappropriate patient care. Please see the online laboratory case studies in the supplementary information on the SHOT website (https://www.shotuk.org/shot-reports/report-summary-and-supplement-2019/). Laboratory staff should feel empowered to discuss requests with clinicians which they feel are inappropriate. The National Institute for Health and Care Excellence (NICE) and the British Society for Haematology have clear guidance regarding the indications for blood transfusion and laboratory staff have the knowledge to assist their clinical colleagues in making informed choices (NICE 2015; BSH 2018).

Appropriate actioning of results is essential to allow everyone involved in the care of the patient to make informed clinical decisions (see Case 11a.4 in Chapter 11a, Delayed Transfusions and repeated in Case 22.2, Chapter 22, Paediatric Cases).

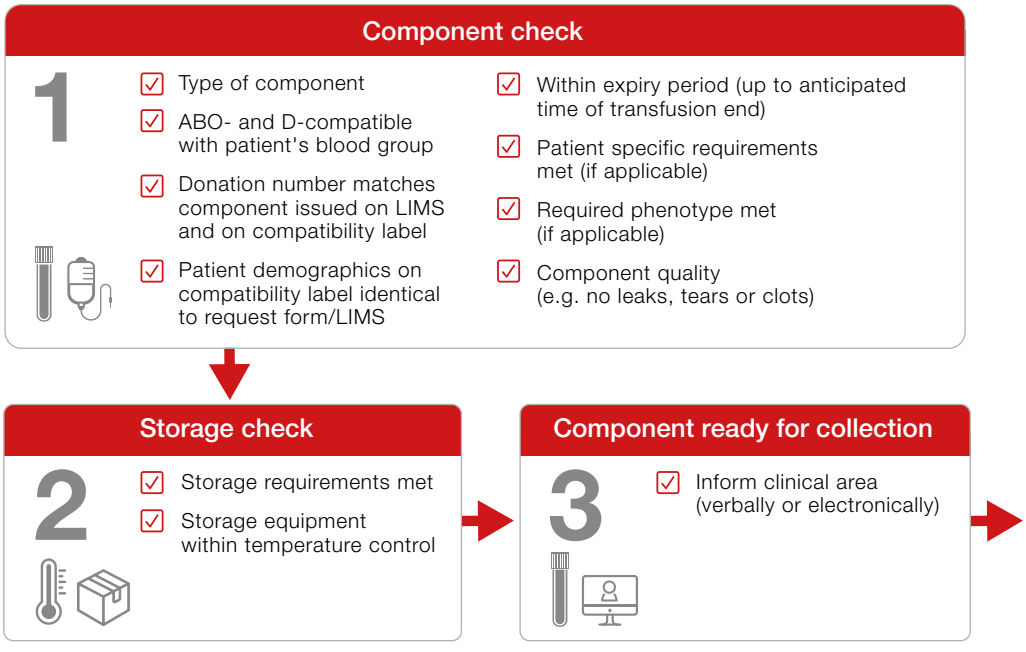


Figure 14.1: Laboratory component labelling and exit check

Major morbidity n=2

Laboratory errors continue to have severe consequences for the patient. In 2019 there were 15 deaths reported, though none were directly related to blood transfusion (imputability 0, excluded or unlikely). Two further cases were reported with major morbidity. One case included sensitisation to the K antigen, please see the online laboratory case studies in the supplementary information on the SHOT website (https://www.shotuk.org/shot-reports/report-summary-and-supplement-2019/). The other case of major morbidity occurred due to delays in the major haemorrhage setting (imputability 1 possible). There were also 8 cases reported where minor/moderate morbidity occurred.

ABO-incompatible transfusion (ABOi) n=3

Laboratory errors contributed to 3 ABOi transfusions in 2019. All cases were due to component selection errors, 1 of which is discussed in Case 14.1. Two of these errors occurred during a major haemorrhage situation. ABOi cases are discussed in further detail in Chapter 9, Incorrect Blood Component Transfused (IBCT).

Case 14.1: Patient blood group O D-positive transfused a unit of group A D-positive red cells in error

Following activation of the major haemorrhage protocol (MHP) for a ruptured abdominal aortic aneurysm (AAA) patient when their blood group was unknown, a biomedical scientist (BMS) selected four units of group A red cells instead of O for pack one. This was collected and taken to theatres where one unit was transfused. The patient's sample then arrived and was processed and grouped as O D-positive and the error was then realised. All remaining units were immediately recalled. Initial assessment of the patient showed no adverse reaction, but laboratory investigations showed evidence of haemolysis postoperatively, renal function declined minimally and then improved. There was evidence of intravascular coagulopathy with low platelets. All indicators improved with conservative treatment and there were no clinical sequelae directly related to the ABOi transfusion. The patient recovered and was discharged home a week later.

Root cause analysis (RCA) identified that the LIMS produces an alert where the ABO blood type of the patient is known but does not prevent or alert issue of red cells that are not group O in an emergency setting where patient blood group is unknown.

The LIMS should be robust and used to its full functionality, preventing ABOi units being assigned to the patient record, and thus issued, especially in an emergency when the patient's blood group is unknown.

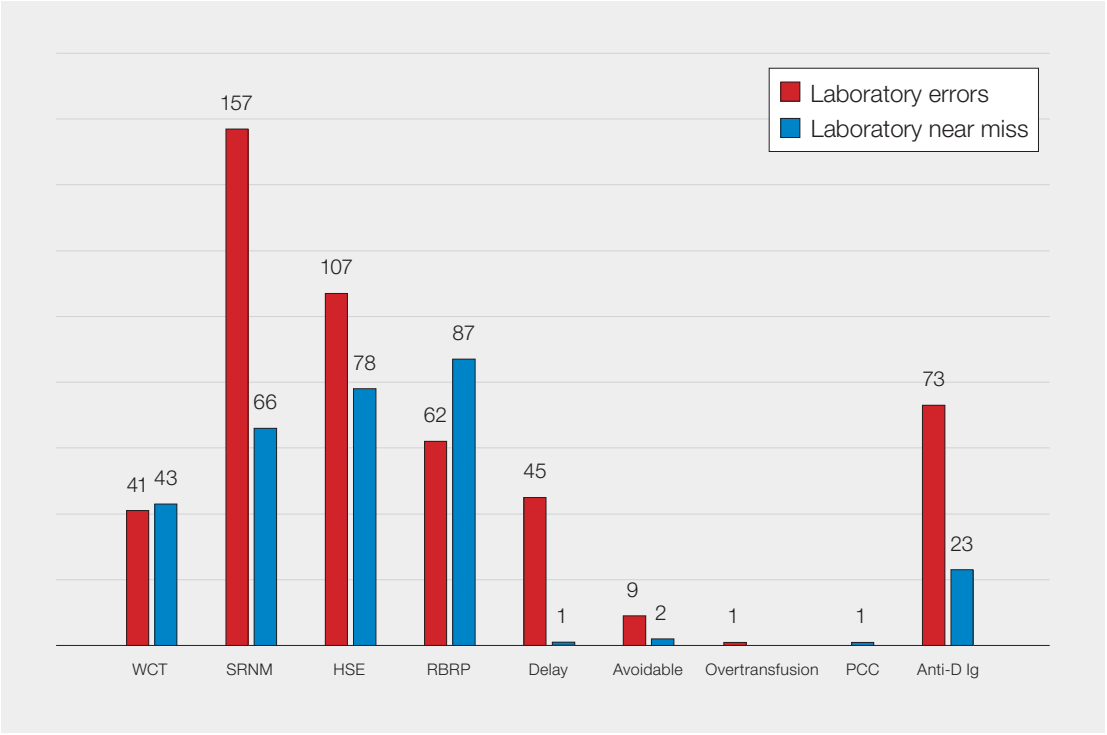
SHOT 2017 recommendation 2- All available information technology (IT) systems to support transfusion practice should be considered and these systems implemented to their full functionality. Electronic blood management systems should be considered in all clinical settings where transfusion takes place. This is no longer an innovative approach to safe transfusion practice, it is the standard that all should aim for (Bolton-Maggs et al. 2018).

Trends in error reports

The highest proportion of errors occur within the IBCT-specific requirements not met (SRNM) category, with testing errors within this category showing a marked increase from 45/114 (39.5%) in 2018 to 80/157 (51.0%) in 2019 (Narayan et al. 2019). Furthermore, the number of handling and storage errors (HSE) error reports has almost doubled from 69/530 (13.0%) in 2018 to 107/495 (21.6%) in 2019. A proportion of the HSE errors, 23/107, were due to a single incident affecting 23 patients and is described as Case 10.2 in Chapter 10, Handling and Storage Errors (HSE). However, excluding these 23 cases there was still an overall increase of 15 incidents.

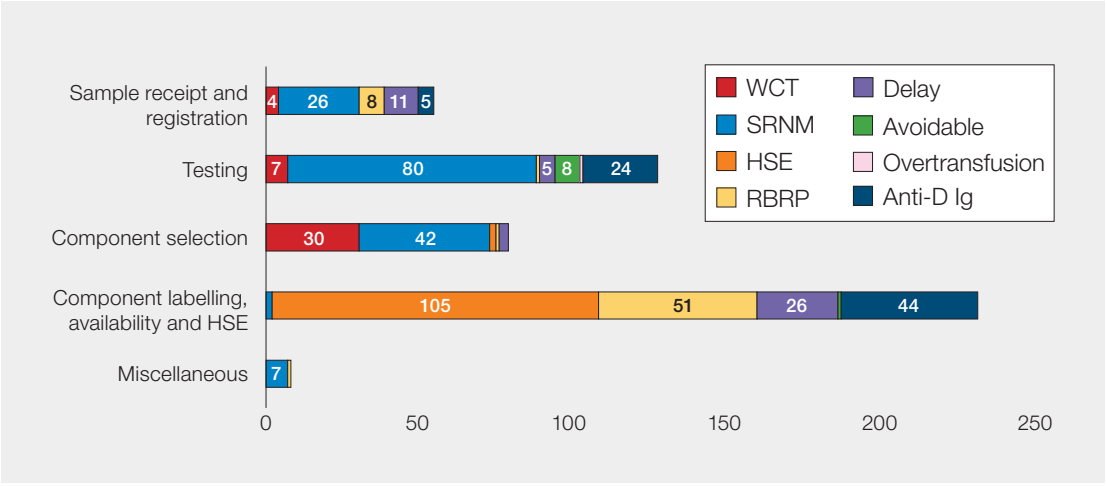
It is of concern that similar patterns and themes are observed in laboratory reports, and that learning from previous SHOT recommendations does not seem to have been embedded within laboratory culture. A safety-II approach to incident investigation and review of laboratory procedures could help identify potential gaps which can be rectified, and also areas of success which may be able to be applied elsewhere (Hollnagel et al. 2015).

Figure 14.2: Laboratory incidents and near misses by category of outcome n=796



WCT=wrong component transfused; SRNM=specific requirements not met; HSE=handling and storage errors; RBRP=right blood right patient; PCC=prothrombin complex concentrate; Ig=immunoglobulin

Figure 14.3: SHOT laboratory data showing at which stage in the transfusion process the primary error occurred n=495



WCT=wrong component transfused; SRNM=specific requirements not met; HSE=handling and storage errors; RBRP=right blood right patient; Ig=immunoglobulin

Numbers <4 are too small to be annotated on the figure: Testing: RBRP=1, overtransfusion=1; Component selection: HSE=2, RBRP=1, Delay=3; Component labelling, availability and HSE: SRNM=2, avoidable=1; Miscellaneous: RBRP=1

Training and competency assessment

Thorough training and competency assessment of staff is essential to prevent errors. However, for this to occur competency assessments need to be fit for purpose. Competency assessments are not infallible, and many laboratory incidents involve staff members who have been deemed competent (Mistry et al. 2019) This illustrates that demonstrating the ability to follow instructions alone may not be enough. Training and competency assessments must reflect work as done (Provana et al. 2020) and incorporate the non-technical aspects of the procedure (e.g. quality and working environment) to ensure staff are fully equipped to handle real life scenarios. Staff must not be exposed to lone working before they are safe to do so.

Case 14.2: Delay in transfusion of solvent-detergent fresh frozen plasma (FFP) in a bleeding acute myeloid leukaemia (AML) patient

A phone call was received from a ward requesting three units of SD-FFP for an actively bleeding AML patient. The BMS on a night shift was unable to issue the units because they had not been shown how to issue this product. The BMS attempted to issue the product on the LIMS, but failed as they were entering the incorrect code for the product and group – creating an alert for ABO-incompatible transfusion. They called the ward to inform them that they were unable to issue the SD-FFP. The plasma was not issued until the day staff arrived which was then 3.5 hours since the requesting phone call was received.

On investigation, training and supervision of the BMS had occurred prior to lone working on night shifts. Laboratory documentation detailed the specific issuing codes, but this information was not contained in the SOP. Formal training and competency assessment to issue SD-FFP had not been provided, and the process had only been talked through.

There were no reported consequences or adverse events for the patient.

All procedures and processes must have an easily accessible standard operating procedure (SOP) that can be retrieved and followed when needed. It is imperative that all laboratory staff are fully trained and competency assessed before being permitted to work unsupervised especially when lone working.

For further laboratory related case studies please see 'Case studies from the SHOT Annual Report 2019' available on the SHOT website https://www.shotuk.org/resources/current-resources/.

Robust and effective competency assessment requires UPTAKE of a collaborative assessment process between management and staff members (Figure 14.4).

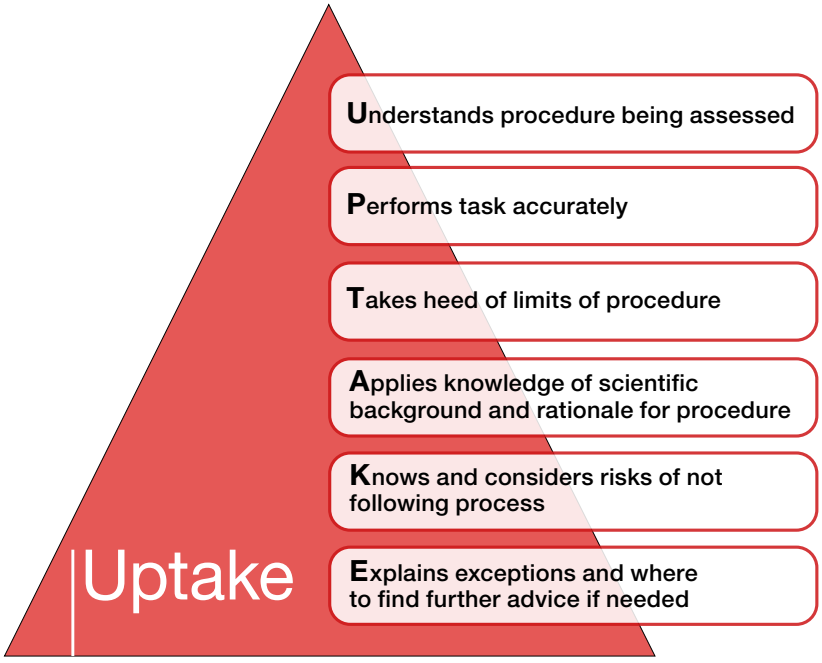


Figure 14.4: UPTAKE areas to be covered in a robust competency assessment

The use of IT in the laboratory

IT has become integral to the day-to-day working in the laboratory. However, there is always further scope to improve the functionality and interoperability of IT within the hospital to increase the safety of these systems. For example, LIMS must allow access to relevant results for other disciplines and have interoperability with other electronic systems in the hospital, such as patient clerking/identification systems to ensure the full patient picture is taken into account. This is of particular importance for laboratories working within pathology networks.

Addressing alert fatigue

Laboratory transfusion staff can get overwhelmed by multiple alerts resulting in 'alert fatigue' i.e. tendency to ignore notifications when they become too frequent and hence potential for errors and impact on transfusion safety. Staff can overcome alert fatigue, identify and respond to critical issues in real time, and reduce risk continuously over time if these alerts can be transformed into relevant and actionable intelligence. A structured, proactive approach is suggested to address this by using the following practices:

1. Regularly review and reduce redundant alerts
2. Make all alerts contextual and actionable
3. Ensure appropriate escalation and that correct individuals and teams are notified
4. Apply human factors principles when designing alerts (e.g., format, content, legibility, and colour of alerts). Consider having tiered alerts according to severity, consistently throughout laboratories, so that attention is drawn to those more clinically consequential thus allowing staff to maintain situational awareness and responsiveness
5. Improve the culture of safety in transfusion by creating a shared sense of responsibility between users and developers, paying careful attention to safe IT implementation, and engaging leadership in IT planning, implementation, and evaluation

For further details on IT-related errors please see Chapter 15, Errors Related to Information Technology (IT).

Sample receipt and registration (SRR) n=100 (including 46 near misses)

The majority of SRR errors occur when available information on LIMS is not heeded. Distractions should be kept to a minimum at booking in, as this is the first opportunity to prevent mistakes potentially impacting on a patient's wellbeing.

Learning point

- Staff booking in samples must follow good manufacturing practice (GMP) working and must not be distracted

Testing n=158 (including 32 near misses)

Many testing errors demonstrate incomplete knowledge; however, the majority of staff had passed competency assessment. Staff must be supported and have appropriate knowledge before being asked to issue components.

Learning point

- A robust competency assessment must be completed prior to performing laboratory tasks. Always raise concerns if unsure of a process

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Component selection n=147 (including 69 near misses)

Many patients are being issued units which do not meet their recorded phenotypic requirements (including patients of childbearing potential receiving K-positive units). These errors may result in major morbidity. LIMS should have antibody information easily accessible and should raise an alert flag to check when appropriate.

Learning point

- Laboratory and quality management should review their laboratory information management systems (LIMS) to ensure specific requirements are visible at all key points of the transfusion process. They should work with LIMS providers to rectify any issues uncovered

Component labelling, availability and handling and storage errors n=373 (including 144 near misses)

Component labelling is a key step within the laboratory and requires extra vigilance. This is the last chance for the laboratory to detect and rectify any error before components are made available to clinical staff.

Learning point

- Laboratory staff should stop and objectively review all component labelling prior to release to the clinical area. Never assume and always check previous steps have been performed correctly

A learning point from the 2018 Annual SHOT Report still requires further implementation – 'Alerts must be dealt with or escalated immediately, and steps that need to be taken must be included in a robust protocol/procedure' (Narayan et al. 2019).

Near miss cases n=301

The highest proportion of laboratory near misses are RBRP events, 87/301 (28.9%). In 74/87 (85.1%) this involved transposition or failure to apply compatibility labels. This shows a lack of attention to detail at the labelling step in the laboratory, which is then being identified at the bedside administration check. A simple check in the laboratory prior to release could prevent these errors which, undetected, could cause patient harm.

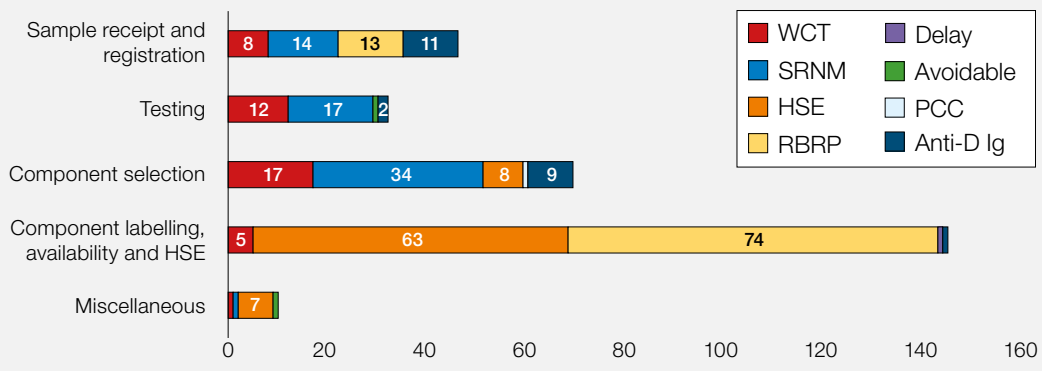

Figure 14.5: SHOT near miss laboratory errors showing at which stage in the transfusion process the primary error occurred with outcome n=301

WCT=wrong component transfused; SRNM=specific requirements not met; HSE=handling and storage errors; RBRP=right blood right patient; PCC=prothrombin complex concentrate; Ig=immunoglobulin

Numbers <2 are too small to be annotated on the figure. All segments with no data label=1

Case 14.3: Non-irradiated cells issued for a patient with a history of Hodgkin lymphoma due to convoluted LIMS procedure

A patient in his 80s, with a history of Hodgkin lymphoma, in ICU required a red cell transfusion. The request sent to the laboratory clearly indicated the requirement for irradiated blood and this information was inputted on the patient's record on LIMS, however a secondary step of adding this requirement to the product issue page was not completed. Non-irradiated blood was issued remotely through Hemobank 80®. The requirement for irradiated blood was overlooked at collection, however it was identified by the healthcare support worker and nurse at the patient's bedside. The laboratory was contacted and a new unit of blood issued via Hemobank 80®.

Only one of the two members of laboratory staff involved in the issue of the blood had completed their competency assessment, and the other was a new starter (a large volume of staff turnover was also listed as a contributory factor). The investigation also noted that the application of flags in LIMS is not uniform and has caused confusion. Some flags are for information only, whilst others require direct action; for some flags a single step is required to apply this to the patient record and others require the two steps. Furthermore, the information regarding specific requirements on the clinical patient record does not link to the LIMS. The laboratory management team are investigating the possibility of altering the irradiated flag on LIMS to prevent remote issue of blood but cannot currently change the system of recording specific requirements.

This case illustrates the importance of having clear procedures within the laboratory, that staff must be trained correctly prior to performing procedures, the value which would be added through interoperability of electronic systems and the critical nature of the bedside check.

Conclusion related to laboratory reports

Laboratory errors continue to occur despite reflective best practice guidance each year in the Annual SHOT Report. To make positive change within laboratories it is essential that investigations look beyond the staff involved as being the only reason for the error. Policies and procedures need to be as simple as possible, whilst still containing all relevant technical information, to ensure that staff have access to concise instructions and information at all times. Furthermore, it is imperative that when these laboratory processes are reviewed, they are robust enough to address current challenges and guidelines. The standard of transfusion knowledge and education within laboratories is becoming a prevalent source of error, and poor practice (cutting corners) should be identified and corrected as soon as possible, before it results in errors. A more in-depth knowledge of the clinical aspect of transfusion for laboratory staff may be of benefit, so as to make laboratory staff aware of their important role in the transfusion process and of the potential consequences to the patient when things go wrong.

Many of the errors reported in this chapter are reportable to both SHOT and the MHRA. Incident/near miss reporting is a key requirement of any QMS, and thorough investigation and identification of the root causes are vital to ensure good quality CAPA are implemented. When developing corrective actions, addressing errors whilst understanding the human factors involved will provide benefits in the long term. It will prevent errors from occurring and ensure safe laboratory practices and also the safe provision of blood components for transfusion. Evidence from the reporting of errors can be further used to ensure laboratories are provided with the correct resources. However, laboratory managers and staff may also need to identify innovative and novel ways of utilising their existing resources more effectively. The pathology services continue to be under intense pressure in a climate where the workforce is stretched and under-staffed, therefore it is even more vital that vigilance and duty of care are upheld to ensure safe transfusion and patient safety.

Recommended resources

Empowering laboratory staff to improve appropriate use of red cells in adults
https://hospital.blood.co.uk/patient-services/patient-blood-management/single-unit-blood-transfusions/

Patient Safety Network: Alert fatigue in healthcare
https://psnet.ahrq.gov/primer/alert-fatigue

Atlassian: Understanding and fighting alert fatigue
https://www.atlassian.com/incident-management/on-call/alert-fatigue

UK Transfusion Laboratory Collaborative: 2019 survey
https://www.shotuk.org/wp-content/uploads/myimages/UKTLC-2019-summary-final.pdf

Medicines and Healthcare products Regulatory Agency (MHRA) / inspectors report

Author: Chris Robbie

SHOT and the MHRA have independently assessed 2019 reports according to their specific remits, and the findings and advice are complementary. Reporters should look beyond 'human error' as the cause of error and investigate thoroughly to identify quality management system (QMS) improvements that address the human factors that lead to error. Whether addressing error covered by the scope of the Blood Safety and Quality Regulations (BSQR) or broader hospital transfusion safety, laboratories and clinical areas must work together, making best use of their limited resources to achieve component and patient safety (BSQR 2015).

A detailed analysis and commentary on MHRA data can be found in Chapter 26, Medicines and Healthcare products Regulatory Agency Report.

UK Transfusion Laboratory Collaborative (UKTLC): Culture Concerns

Author: Rashmi Rook, Chair UKTLC

During 2019, there has been worrying and distressing information provided to the UKTLC organisations both verbally and via various surveys on a prevalent 'blame culture' affecting our laboratory teams. (UK Laboratory Culture Survey 2019).

- Reports about staff being identified and criticised in front of colleagues when involved in MHRA/ SHOT reportable incidents
- Laboratory staff being taken through formal disciplinary actions when involved in MHRA reportable errors
- Staff unable to discuss with senior managers any potential patient and staff safety concerns due to previous negative behaviours

- False data being submitted to close-out inspection findings (United Kingdom Accreditation Service (UKAS)/MHRA) or provided on the annual Blood Compliance submission

If you are aware of any of the above issues or are affected by these, then please seek appropriate advice. In England, all Trusts have appointed a 'freedom to speak up guardian' (FTSUG), who has a direct line of communication to the executive team (NHS Providers). In Scotland concerns should be escalated to an Independent National Whistleblowing Officer, in Wales the 'freedom to speak up safely' scheme is available and in Northern Ireland those with concerns should contact the designated person as per local whistleblowing policy. Alternatively, please raise any concerns with UKTLC or through the MHRA whistleblowing scheme.

Part of any quality improvement program relies on each of us being freely able to voice concerns and work in an environment which is open and transparent without fear or blame. A 'psychologically safe' place where staff can ask questions and raise concerns without being ridiculed, teams make improvements together, different views are respected, and everyone enjoys working and learning together even with the daily challenges we face.

Quality improvement activities lead to a heightened recording of errors, mistakes, incidents and quality failures, and reporting of these within the QMS framework proactively addresses them. There must be an understanding across the pathology leadership teams that heightened awareness and reporting is a sign of a *good quality culture* and something to be proud of, rather than criticising the staff involved and supressing 'bad' news.

Senior laboratory and pathology management, including quality managers, transfusion practitioners, and pathology IT managers should ensure that as part of their continuing professional development responsibilities they have awareness, understanding and can apply the following concepts to effectively carry out their roles and maintain patient and staff safety:

- Human factors/situational awareness
- Root cause analysis, errors management, trend analysis
- Process mapping and designing improvements
- Lean and Kaizan/visual awareness
- Continual improvement processes
- Compassionate leadership
- Good supervision skills
- QMS procedures
- Accreditation and regulatory standards
- Change management

Pathology teams must work together and primarily build quality into all tasks by removing the barriers that create extra work and pressures on our staff and affects morale. Our people have the right to work with pride, know they are doing a good job as safely as possible, and to meet the ever-increasing demands and challenges within this amazing profession.

The following recommendations were made in the report 'A promise to Learn - A commitment to act' (National Advisory Group on the Safety of Patients in England, 2013) which remain pertinent to the discussion on safety culture in the laboratory:

- Drive out fear from an organisation as this is toxic to safety and improvement so that everyone may work effectively for our patients and hospitals
- Break down barriers between departments. People from different departments within a hospital must work as a team

- We should continually and forever reduce patient harm by embracing wholeheartedly an ethic of learning
- Mastery of quality and patient safety sciences and practices should be part of initial preparation and lifelong education of all healthcare professionals, including managers and executives
- Make sure pride and joy in work, not fear, infuse healthcare

The updated UKTLC minimum standards for staff qualifications, training, competency and the use of information technology in hospital transfusion laboratories are due to be published in 2020.

UK National External Quality Assessment Scheme (UKNEQAS)

Author: Claire Whitham

Participation in external quality assessment (EQA) offers the chance to learn from errors. The errors made in EQA exercises can be viewed as 'free lessons', as appropriate corrective action can be taken before the error occurs with a clinical sample.

Two common themes emerged in 2019 in relation to phenotyping. The first was related to following 'instructions for use' for reagents or testing methods, and the second to the selection of appropriate cells for use as a positive control.

During exercise 19R5, nine laboratories recorded a total of 12 incorrect phenotype results for M and/or N. Two of these laboratories recorded the improbable phenotype M-N- for Donor W. When performing phenotyping it is important that a positive control using cells with the weakest normal expression of the antigen is used (e.g. heterozygous M+N+ cells); the strength of these results should be reviewed before reporting. If an improbable phenotype result (e.g. M-N-) is obtained consideration should be given to repeat testing prior to reporting. Using cells with apparent homozygous expression for a control can result in missing any sensitivity issues with a reagent and lead to false negative phenotyping results being reported; any suspected sensitivity issues should be reported to the reagent supplier.

During 19R8, 12 laboratories recorded a false negative reaction vs. anti-Jk^b for one or both of the two Jk(a+b+) donors in the exercise, with five of these obtaining a negative reaction vs. both Donors W and Y. Ten of these laboratories were able to retest after the closing date. On repeat testing, five obtained a ≥2+ reaction, one a 1+ reaction, three an equivocal reaction (that they would not have reported in clinical practice) and one a negative reaction. Nine of the ten repeating the testing were using the same reagent that had seen sensitivity issues previously, as discussed in reports for exercises 18R2 and 18R8; this included the four obtaining either weak or negative results on repeat. Two of the nine using this reagent identified the cause of the original false negative reactions as a failure to follow the manufacturer's prescribed method; the remaining seven could not identify the cause; these include those obtaining a reaction of <2+ on repeat testing.

As with all testing it is important that manufacturer's instructions are followed and that the limitations of reagents in use are considered. Commercial phenotyping reagents generally give 'strong' reactions with antigen positive cells, and it is advisable to repeat tests and question results where a weaker than expected reaction is obtained with either the positive control or with an individual test. Phenotyping interpretations should not be made on equivocal results, and for clinical samples consideration given to referral of these tests.

Institute for Biomedical Science - commentary on pathology networks

Author: Anne Lockhart

Pathology networks have a huge part to play in supporting the future of healthcare, including service change and redesign and improving quality. They contribute to the provision of safe and sustainable

services for the future, which respond to user needs, future requirements and ensure compliance with national guidelines.

Two key challenges faced by transfusion laboratories in delivering a safe and effective service in a pathology network are inadequate IT resource and staffing.

A standard LIMS is a key enabler for pathology consolidation, allowing samples to be processed anywhere in the network, without the additional manual intervention that can lead to delays or quality problems. Separation of the LIMS and patient administration system across a network makes peripheral blood management data collection more difficult. Standardisation of IT gives the potential to allow for effective benchmarking across all laboratories and creates opportunity for systematic harmonisation of transfusion laboratory practice e.g. training, competence, standard operating procedures and equipment.

There remains a great risk that these changes will also result in the loss of staff and expertise from transfusion laboratories, with many staff nearing retirement opting to leave. This poses a risk to service, with the additional complexities of recruitment, training and adopting new technologies. The issue of losing staff is compounded by the need to cope with the change management aspects, so you need more staff than usual not less. Most of these changes envisage reductions in staff and these changes are enacted as quickly as possible without thinking about how the changes are going to be delivered while still coping with routine work.

It is important that throughout, organisations have robust workforce plans, which should be reviewed and updated to allow for continual delivery of service whilst ensuring the correct level of expertise. There are many opportunities for both biomedical and clinical scientists to adopt new advanced roles, which not only allow networks to progress, but also deliver a high-quality service through developing staff to work at their top capability.

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