

Medicines and Healthcare products Regulatory Agency (MHRA) Report on Blood Safety and Quality Regulation in 2018

Authors: Chris Robbie, Mike Dawe and Shirley Stagg

Acknowledgement to a Blood Science Manager from a Teaching Hospital with a trauma centre for additional data

Introduction

The United Kingdom (UK) Blood Safety and Quality Regulations 2005 (as amended) (BSQR) require that serious adverse events (SAE) and serious adverse reactions (SAR) related to blood and blood components are reported by blood establishments (BE), hospital transfusion laboratories and facilities to the MHRA, the UK Competent Authority (CA) for blood safety. This requirement is enabled by the Serious Adverse Blood Reactions and Events (SABRE) reporting system. All data within this report are correct as of 17/01/2019.

Key MHRA messages

- In accordance with the requirements of the Good Practice Guide (Council of Europe, 2018) reporting establishments must improve their formal arrangements for investigating deviations and non-conformances. Identifying human error as the root cause should be justified only after having ruled out other improvements to the quality management system (QMS)
- All staff involved in transfusion must work together to prevent errors at source and use resources appropriately. Detecting and correcting errors made in the clinical areas requires allocation of significant laboratory resource

Summary

The number of SABRE reports, especially SAE has increased in 2018 from last year. These are reports where the confirmation report has been submitted between 1st January 2018 and 31st December 2018. Where this is in part due to one hospital's zero tolerance policies, regarding sample acceptance and component collection error resulting in more reports being generated from them, it does not account for all of the increase. Although the data collected would seem to indicate that SAE are the result of failures in individuals, evidence from other SABRE reports, MHRA inspection reports, MHRA site visits and anecdotal evidence from discussion with reporters, would seem to suggest that the data does not fully describe the whole situation. There is evidence that investigations are not detailed enough to uncover the true root causes of errors. MHRA data and evidence from SHOT, the UK Transfusion Laboratory Collaborative (UKTLC) and other sources would suggest that staffing, skill-mix, education, training, process mapping and procedures all need to be improved to develop, maintain and improve a robust QMS.

SABRE report data

Table 25.1 and Figure 25.1 display the total number of SABRE confirmation reports that were submitted and satisfy the European Commission reporting criteria for SAR and SAE since 2009. Previous years data are live, and subject to amendment, so the table has been updated to reflect changes made to historic reports.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
SAE	968	889	810	931	705	762	764	1027	1076	1198
SAR	501	549	444	343	345	346	262	464	508	408
Total	1469	1438	1254	1274	1050	1108	1026	1491	1584	1606

Table 25.1:
Submitted SABRE confirmation reports 2009–2018

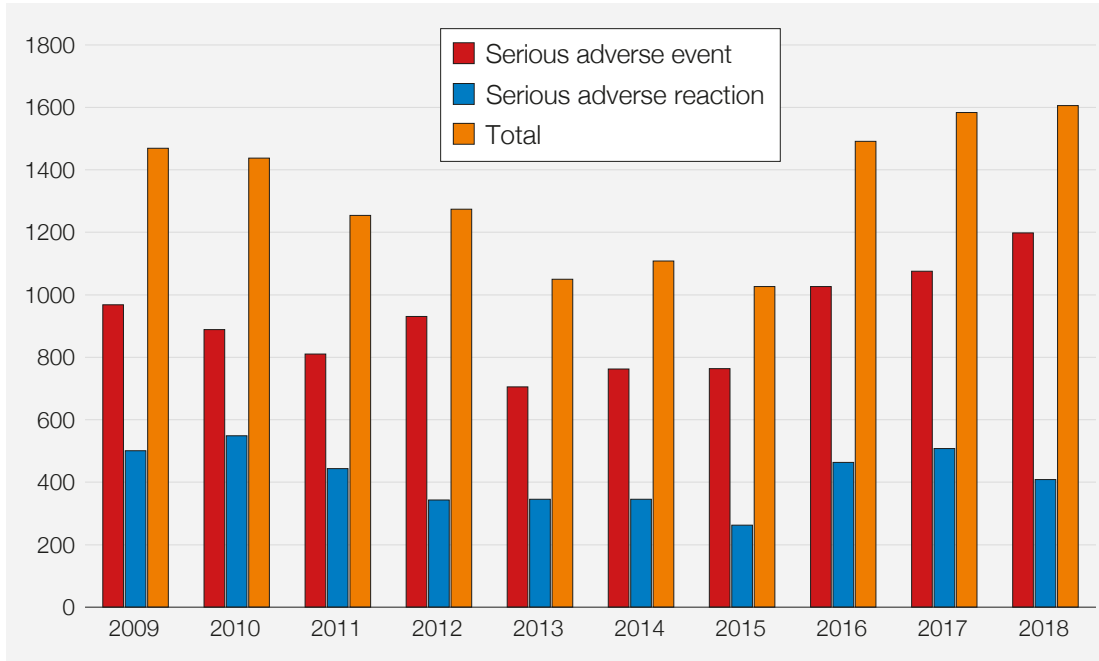


Figure 25.1:
Submitted SABRE confirmation reports 2009–2018

There has been a slight increase in the total number of reports received by the MHRA that qualify for onward reporting to the European Union (EU) (1.3%). However, there is an increase (10.2%) in the number of SAE reports and a decrease of (24.5%) in the number of SAR. There are a number of factors which can affect the total number of reports received in any one year which are unrelated to blood safety and quality and transfusion in patients.

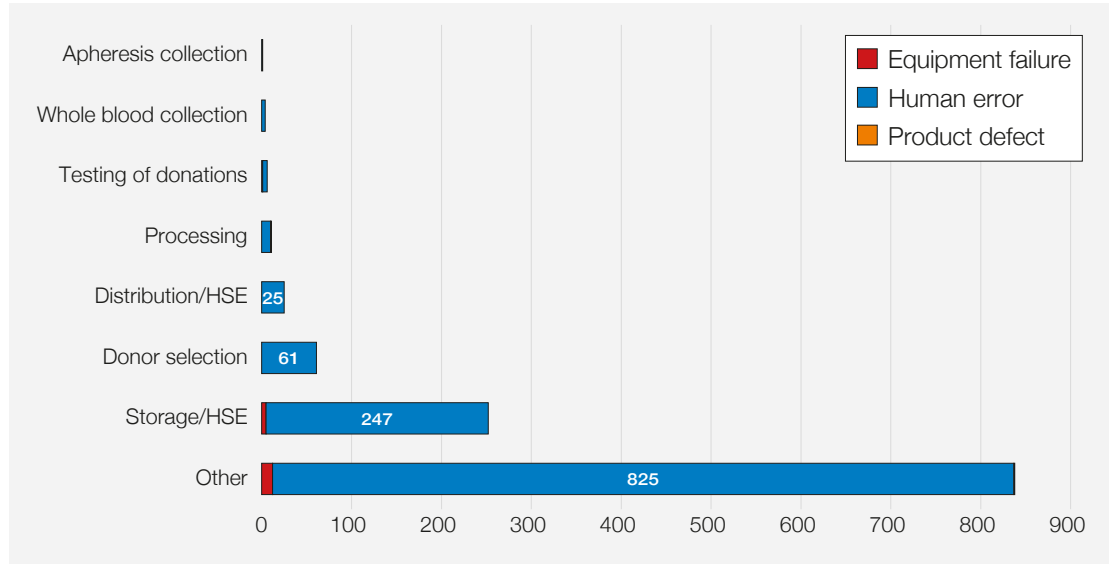
- For SAR, the MHRA is dependent on the process of SHOT questionnaires being completed by reporters, reviewed by SHOT experts and the confirmation reports being completed by the SHOT office prior to the end of December for those reports to qualify in the reporting year. This is not a criticism of the process of reporting, nor SHOT, but should be remembered before comparing year on year data
- For SAE, the factors are more complex. In 2018, one single hospital reported 67 more SAE than in the previous year accounting for over half of the increase in SAE reported. Assessment of this hospital’s reports show that this increase is more a reflection of their strict zero tolerance policies to sample acceptance and component collection processes rather than demonstrating a significant deterioration in their QMS

Evidence from the annual summary report exercise shows that the number of components collected by blood establishments is decreasing, yet the number of patients being transfused is increasing. This would suggest that blood management and conservation is improving the use of components by recycling unused blood. It would also suggest workloads are increasing as more patients being transfused would indicate more samples and associated process steps in acceptance, testing, issuing, etc. Therefore, an increase in numbers of SAE reports should not necessarily be seen to be a reflection on overall quality and safety.

Serious adverse events

Definition: (BSQR 2005) Any untoward occurrence associated with the collection, testing, processing, storage and distribution, of blood or blood components that might lead to death or life-threatening, disabling or incapacitating conditions for patients or which results in, or prolongs, hospitalisation or morbidity.

Figure 25.2:
2018 SAE
confirmation reports
by deviation and
specification



HSE=handling and storage errors

Numbers too small to be annotated on the figure: Apheresis collection: Human error=1, Whole blood collection: Human error=4, Testing of donations: Equipment failure=1; human error=5, Processing: Human error=10; product defect=1, Storage/HSE: Equipment failure=5, Other: Equipment failure=12; product defect=1

Similar to previous years there is no real change in the proportions of each category of reported SAE. ‘Other’ and storage categories contain the most reports, and factors associated with human error remain the main root cause.

Storage data n=252 (-3)

Storage remains the second largest individual error category and comprises of all BSQR reportable storage SAE in both the laboratory and clinical areas. For a breakdown of handling and storage errors (HSE) please see the relevant sections of Chapter 14, Laboratory Errors and Chapter 9, Handling and Storage Errors (HSE). The MHRA has broken this category down further to try and identify specific storage error subtypes, Table 25.2. For a description of the subcategories used, see Appendix 1.

Table 25.2:
SAE storage error
subclassifications
2018

Storage subclassification	2018 (+/- 2017)	2017 position
Incorrect storage of component	98 (+30)	2
Component expiry	57 (-17)	1
Sample expiry	41 (-5)	3
Storage temperature deviation	18 (+10)	6
Failure to action alarm	11 (-8)	5
Return to stock error	8 (-11)	4
30 minute rule	8 (+1)	8
Miscellaneous	6 (0)	9
Security	5 (-3)	7
Total	252 (-3)	

Although the total number of reports in the storage category remains similar to last year, there are some quite significant changes in the numbers of reports in the subcategories. As discussed in last year’s chapter, although component expiry and sample expiry describe different errors, the processes that control

these errors are similar. There has been a reduction (18.3%) in these categories which demonstrates improvements in the processes that identify and remove expiring components has been made.

Further improvements in the laboratory QMS can also be demonstrated by a 50% reduction in the combined failure to action alarm and return to stock error categories.

Unfortunately, there have been some significant increases in some storage SAE subcategories. There is a recorded 44.1% increase in incorrect storage of components. These errors can occur in both laboratory and clinical errors involving laboratory, clinical and portering staff. Analysis of these reports demonstrates that the majority of these errors occur solely in clinical areas, however.

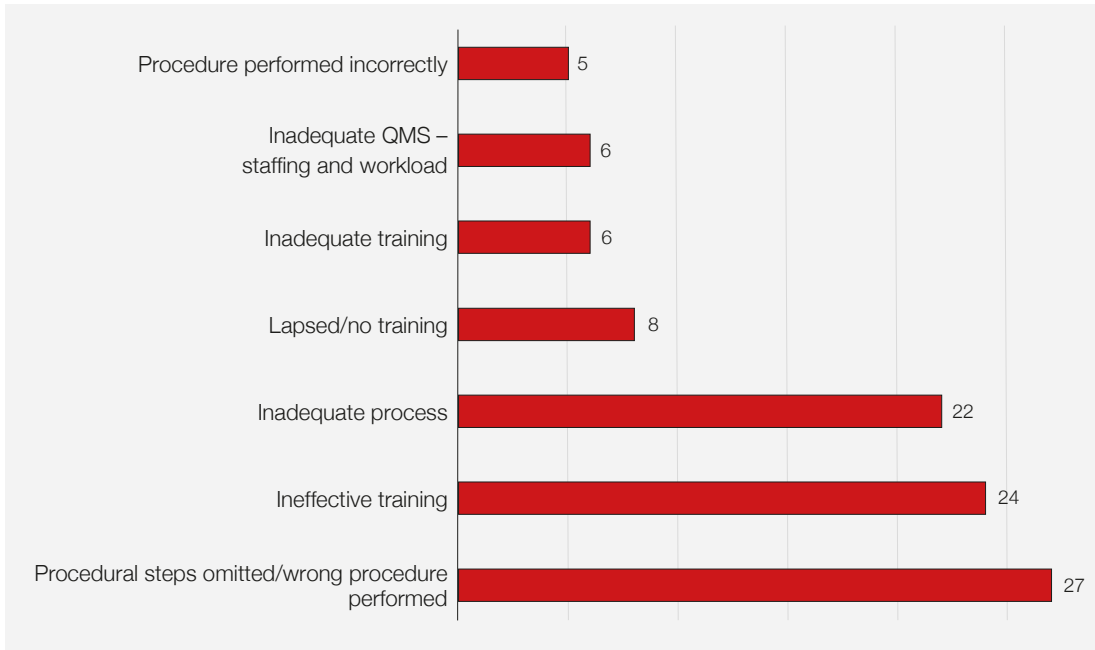


Figure 25.3:
Incorrect storage
of component by
specification 2018

The MHRA defined, ‘human error’ category (Appendix 3), shows that 24.5% of the errors are the result of staff not following their training and 22.5% of errors were the result of inadequate processes. The resultant investigations showed that the root cause was often due to:

- Procedures, in clinical areas, not being properly planned or defined resulting in staff not being aware of who was taking responsibility for the storage process
- The lack of availability of sufficiently trained staff
- Poor planning and communication
- Regular storage locations being unavailable
- A combination of factors demonstrating an overall lack of an adequate system for controlling the quality and safety of blood and components

The case study below demonstrates some of these factors.

Case 25.1: Lack of adequate transfer and storage procedures

Two units had been removed from the pathology refrigerator and placed in a ‘30-minute blood box’ to transfuse to a patient on the ‘cancer bus’. Although the first unit would have been transfused within 4 hours, the second unit would not have been completed in time. Investigation showed that there had been no communication to the blood transfusion laboratory regarding when the transfusion would take place and no risk assessment of the use of blood on the cancer bus had taken place. Consequently, there was no protocol or procedure in place for the transfer and storage of blood in this situation. This demonstrates a failure, or lack of a robust change management procedure.

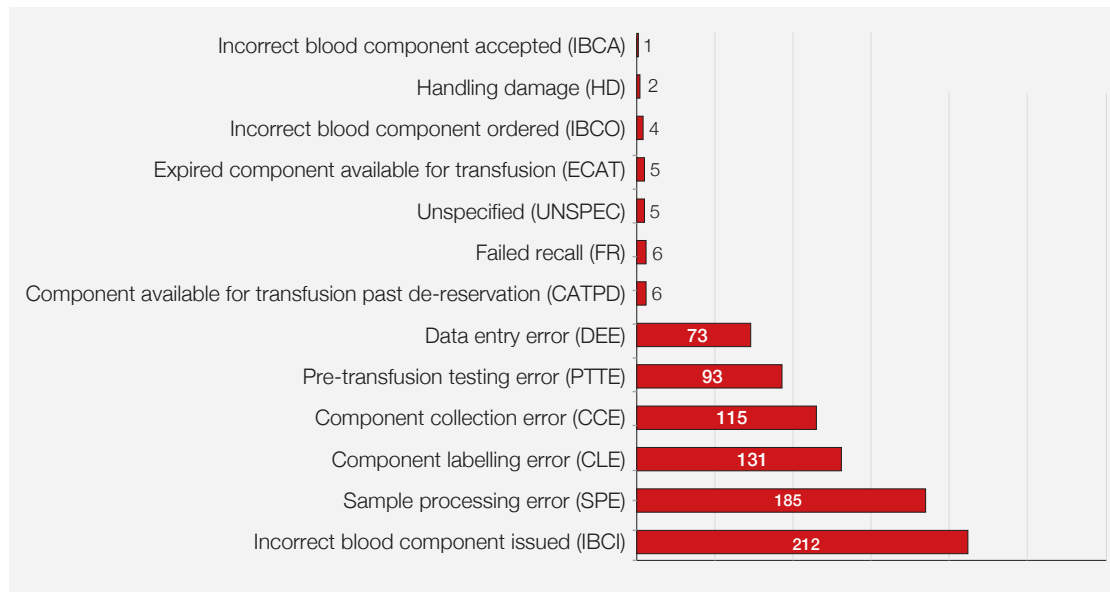
Other n=838 (+112)

Since 'other' is the largest category of SAE reports, the MHRA haemovigilance team has created subcategories to further analyse this type of error, Table 25.3. For a description of subcategories, see Appendix 2.

Table 25.3:
SABRE reports,
subcategory
'other' 2018

Other subcategory	2018 (+/- 2017)	2017 position
Incorrect blood component issued (IBCI)	212 (+37)	1
Sample processing error (SPE)	185 (+62)	2
Component labelling error (CLE)	131 (+17)	3
Component collection error (CCE)	115 (+21)	5
Pre-transfusion testing error (PTTE)	93 (-11)	4
Data entry error (DEE)	73 (+2)	6
Component available for transfusion past de-reservation (CATPD)	6 (+1)	9=
Failed recall (FR)	6 (-12)	7
Unspecified (UNSPEC)	5 (-4)	8
Expired component available for transfusion (ECAT)	5 (0)	9=
Incorrect blood component ordered (IBCO)	4 (-1)	9=
Handling damage (HD)	2 (0)	12
Incorrect blood component accepted (IBCA)	1 (0)	13
Total	838 (+112)	

Figure 25.4:
SABRE reports,
subcategory
'other', 2018



There has been a 15.3% increase in the number of SAE reports that fall into the 'other' category. Even accounting for the single hospital that reported 67 of the additional 111 reports received, this still indicates a 6.1% increase in the number of SAE reports categorised as 'other'.

Although the spread of reports falling into the individual subcategories has not changed much, the data would show that the QMS needs to improve when it relates to the selection of:

- Components for specific requirements
- Receipt of samples into the laboratory
- Component labelling

The fourth largest category is component collection error. These errors can occur when components are collected directly from the laboratory, or when collected from storage locations. Although a small number of reports involve laboratory error, the majority of these reports concern clinical and/or portering staff.

The data suggests some areas of improvement, specifically concerning pre-transfusion testing errors which may be related to automation and improved process controls, and failed recalls, again demonstrating improved processes once a recall is received from the blood establishment.

Human error category and human factors

The Chartered Institute of Ergonomics and Human Factors definition of human factors is: 'the scientific discipline concerned with the understanding of interactions among humans and other elements of a system.' (CIEHF 2019).

For the purposes of this report the human factors have been assessed in terms of how they affect the way a human thinks and performs, or in other words behaves during a work situation. These will either lead to an action being successful, or it will lead to human error and can be organisational, job-related or related to the individual concerned. In the context of this data analysis, reports that fall into the human error category are not to be seen only as mistakes made by individuals. The sub-categorisation aims to identify QMS failings and improvements before assuming the individual is solely responsible for the human error.

From the Council of Europe Good Practice Guidelines (Council of Europe 2016), the requirements for investigation are;

1.2.13. A formal system for the handling of deviations and non-conformances must be in place. An appropriate level of root-cause analysis should be applied during the investigation of deviations, suspected product defects, and other problems. This strategy can be determined using Quality Risk Management principles. If the true root cause(s) of the issue cannot be determined, consideration should be given to identifying the most likely root cause(s) and to addressing them. Where human error is suspected or identified as the cause, this should be justified having taken care to ensure that process, procedural or system-based errors or problems have not been overlooked, if present. Appropriate corrective actions and/or preventive actions (CAPA) should be identified and taken in response to investigations. The effectiveness of such actions should be monitored and assessed in accordance with Quality Risk Management principles.

In order to understand reports in the human error category, the SABRE team has continued to use subcategories which can be applied to the report narratives to help understand the human factors involved. For a description of the categories used, see Appendix 3.

Table 25.4 shows the breakdown of reports in the human error subcategories.

Human error subcategory	Total (+/- 2017)
Procedure performed incorrectly	360 (+69)
Procedural steps omitted/wrong procedure performed	250 (+13)
Inadequate process	214 (+3)
Ineffective training	127 (+8)
Inadequate QMS – staffing and workload	98 (+18)
Inadequate training	57 (+11)
Incorrect procedure	36 (-4)
Lapsed/no training	22 (-3)
Inadequate supervision	14 (+5)
Total	1178 (+120)

Table 25.4:
SABRE reports,
human error
subcategory, 2018

Figure 25.5:
SABRE reports,
human error
subcategory, 2018



QMS=quality management system

NOTE: These numbers should be used as guidance only. The quality of this data is limited by a number of factors.

- The root causes of incidents are usually the result of many contributory factors. The subcategory chosen reflects the most likely reason for the main SAE category
- The subcategory chosen is based on the information in the report. A limited investigation or a report which does not provide the MHRA with enough information may not be subcategorised appropriately

The distribution of categories remains similar to previous years. The data suggests that procedures are performed incorrectly, steps missed out, or wrong procedures followed. These are typically errors resulting from slips or lapses of concentration by individuals.

Staff should be able to cope with certain pressures of workload and distractions, and simply being busy should not be used as an excuse for errors. The quality of work is the responsibility of individual staff and they should take time to ensure they 'get it right first time'. Staff should be encouraged to prioritise their workload and use the support mechanisms available, when they need to, such as delaying non-urgent work, or calling staff for extra support from other laboratories.

It would be wrong, however, to suggest that over half of the SAE are the result of poor concentration by staff. Staff are reported to be under pressure from poor staffing levels, inadequate skill mixes and high workloads. Distractions can also affect concentration and can come from interruptions by other staff, telephone calls, equipment breaking down or not being available and multi-tasking. Quality systems should be designed to be robust and help prevent staff from falling victim to slips and lapses. This will include, but is not limited to;

- Adequate working environment (e.g. lighting, space, equipment, logical design)
- Adequate staffing and skill mix
- Appropriate workloads
- Robust processes
- Accurate procedures
- Adequate training
- Access to information and expertise
- Leadership and supervision

Many report narratives hold staff solely responsible for the errors made. While in some cases this may be true, poor quality investigations and reports overlook the reasons that led to staff behaving and acting in the way that led to the error being made. The MHRA will often contact reporters to clarify details of their SABRE reports and discuss improvements to quality systems which may help prevent errors, but this cannot be done for every single report. It is possible that many of the SAE reports which fall into the procedure performed incorrectly and the procedural steps omitted/wrong procedure performed categories could be assigned to different subcategories with a more detailed investigation and SAE report.

Top five SAE

Procedure performed incorrectly and procedural steps omitted/wrong procedure performed account for over half the SAE reported. Since managing these types of error has been discussed above, the top five types of error have been assessed considering the remaining root cause by type only. There are two types of error which are in fifth place, bringing the total number of categories in the top five to six.

SAE deviation subcategory	Specification subcategory
Incorrect blood component issued (IBCI)	Inadequate process
Sample processing error (SPE)	Inadequate process - staffing and workload
Incorrect blood component issued (IBCI)	Inadequate process - staffing and workload
Incorrect blood component issued (IBCI)	Ineffective training
Component labelling error (CLE)	Inadequate process - staffing and workload
Pre-transfusion testing error (PTTE)	Ineffective training

Table 25.5:
Top five SAE
with human error
subcategory

The following examples have been used to illustrate what might be considered effective CAPA to address the root causes. They are not meant to represent actual investigation processes and CAPA for all similarly categorised incidents, but are representative of many of the reports received, and are clearly designed to focus on improvements to systems, practice and transfusion laboratories.

1) Incorrect blood component issued (IBCI) – inadequate process (n=58)

Irradiated components were required for a patient and the clinical area had emailed two biomedical scientists (BMS) with the requirements. One of the BMS had misread a note on the laboratory information management system (LIMS) referring to an atypical antibody and replied to the email stating that the requirement for irradiated components had been entered.

When blood was required for the patient a request form was sent which did not request irradiated blood. The patient was issued with and subsequently transfused with non-irradiated blood.

The investigation revealed that there was no formal process for the laboratory to action information from the clinical area and no instructions how to enter patient requirements into the LIMS.

CAPA required: Develop processes for receiving and actioning patient requirements and produce standard operating procedures (SOP) to detail the steps required to ensure information is added to patient records correctly.

2) Sample processing error (SPE) – inadequate process – staffing and workload (n=21)

A sample was received but the addressograph label had an incorrect date of birth. This was not spotted when the sample was booked in. The error occurred over a lunch time when staffing was low. The sample was booked in by someone who rarely works in transfusion.

CAPA required: Plan staffing levels and breaks appropriately so that sufficient staff are available to cover the work. If support staff are required to cover periods of low staffing, they must have the necessary level of training and experience to perform all tasks required.

3) Incorrect blood component issued (IBCI) – inadequate process – staffing and workload (n=19)

A patient with sickle cell disease required two units of blood. Rh phenotype performed and recorded correctly as R2R2. However, R1R1 blood was incorrectly selected and issued. The error occurred overnight, during a scheduled period of lone working covering transfusion and haematology, but volume of work and clinical pressures were identified as contributing to the pressure on the member of staff.

CAPA required: Staffing levels and workload need to be balanced at all times of the day. Capacity plans are essential for providing the evidence that lone working is acceptable. A risk assessment of lone working was performed, and a business case is to be developed to increase staffing on night shifts.

4) Incorrect blood component issued (IBCI) – ineffective training (n=18)

Irradiated blood was required for a patient, but non-irradiated issued in error. The requirement was on the LIMS but was not clear. It had not been entered according to the SOP, by a member of staff who does not perform the procedure very often.

CAPA required: It is essential that staff are trained to be able to perform the tasks expected of them, even if they rarely perform them. Periods between training and update training need to be considered carefully according to the individual. It may be required to train staff more frequently than other staff if they perform certain tasks less often.

5) A. Component labelling error (CLE) – staffing and workload (n=17)

Platelets Pack 1 and 2 from the same donor were issued to two different patients by a newly qualified trainee BMS under supervision. The BMS had no experience of multiple packs from the same donor. They were labelled separately, but the labels from Pack 1 were attached to Pack 2 and Pack 2 to Pack 1 in error. The supervisor was busy with other routine work and did not notice the error.

CAPA required: Staff turnover can present additional challenges for laboratory staff when managing workload. Training any member of new staff should be done carefully and the supervisor should not be multitasking when doing so. This incident demonstrates a number of failures, but ultimately, they result from an inappropriate level of staff to cope with the workload.

- Staffing levels are insufficient to be able to adequately train and supervise staff, and to complete routine workload
- This has resulted in the experienced BMS multitasking, rushing and not being able to concentrate on all the tasks expected of them
- Training appears to be inadequate if the trainee was not aware of multi-packs and selection and labelling of the correct component when printing labels

Ensure capacity plans include training and education of staff. Plan training for staff so that sufficient attention can be paid to supervision without compromising workload. Ensure training material covers all essential learning and do not assume that 'newly qualified' staff are fully aware of the practical aspects of working in the laboratory.

5) B. Pre-transfusion testing error (PTTE) – ineffective training (n=17)

A patient was transfused with emergency O D-negative blood inappropriately following a failure by the locum BMS to correctly test a patient sample. The antibody screen was positive and instead of running a panel, the antibody screen was retested. Blood was required and when requested by the clinical area, historic records were not thoroughly checked. Had they been, the BMS would have noticed the patient had an antibody result from 1989. The delay in performing the correct testing and checking resulted in the patient requiring emergency blood rather than matched blood. During investigation the BMS admitted to having 'forgotten' the correct procedures, but also it was noted that the training log did not provide evidence of complete training.

CAPA required: If staff have admitted to forgetting procedures then retraining is appropriate in these cases. However, a review of the training methods should also be undertaken to ensure that there are no training gaps and that any member of staff, locum or otherwise are fully competent to work alone.

Figure 25.6 shows the other subcategory and root cause for all SAE other than procedural steps omitted/wrong procedure performed and procedure performed incorrectly

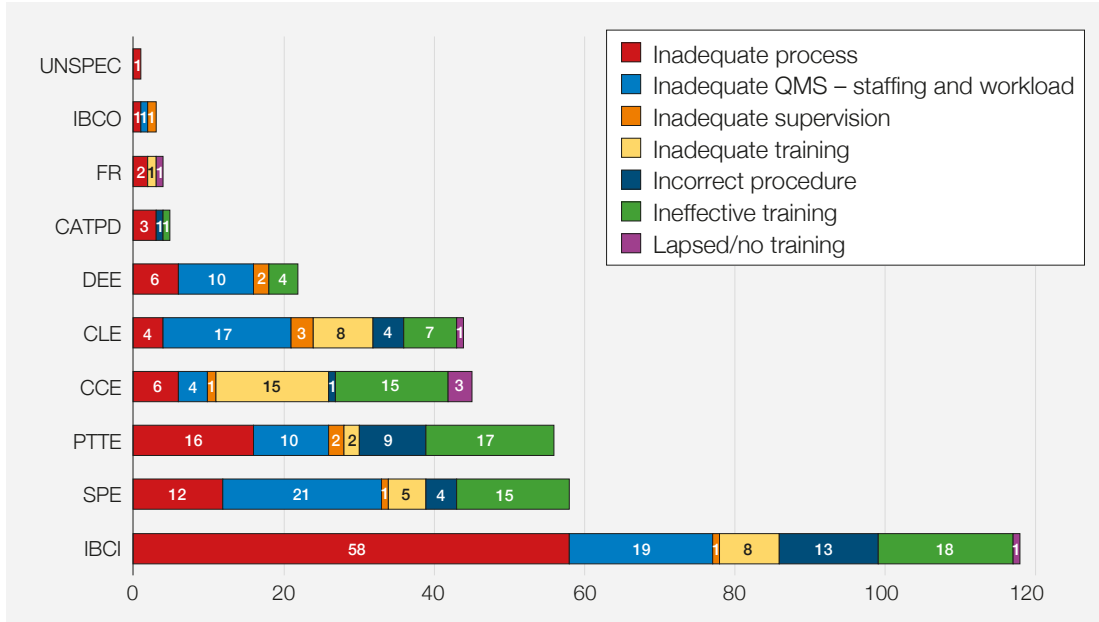


Figure 25.6:
Root causes in the 'other' subcategory

See Figure 25.4 for key to category abbreviations

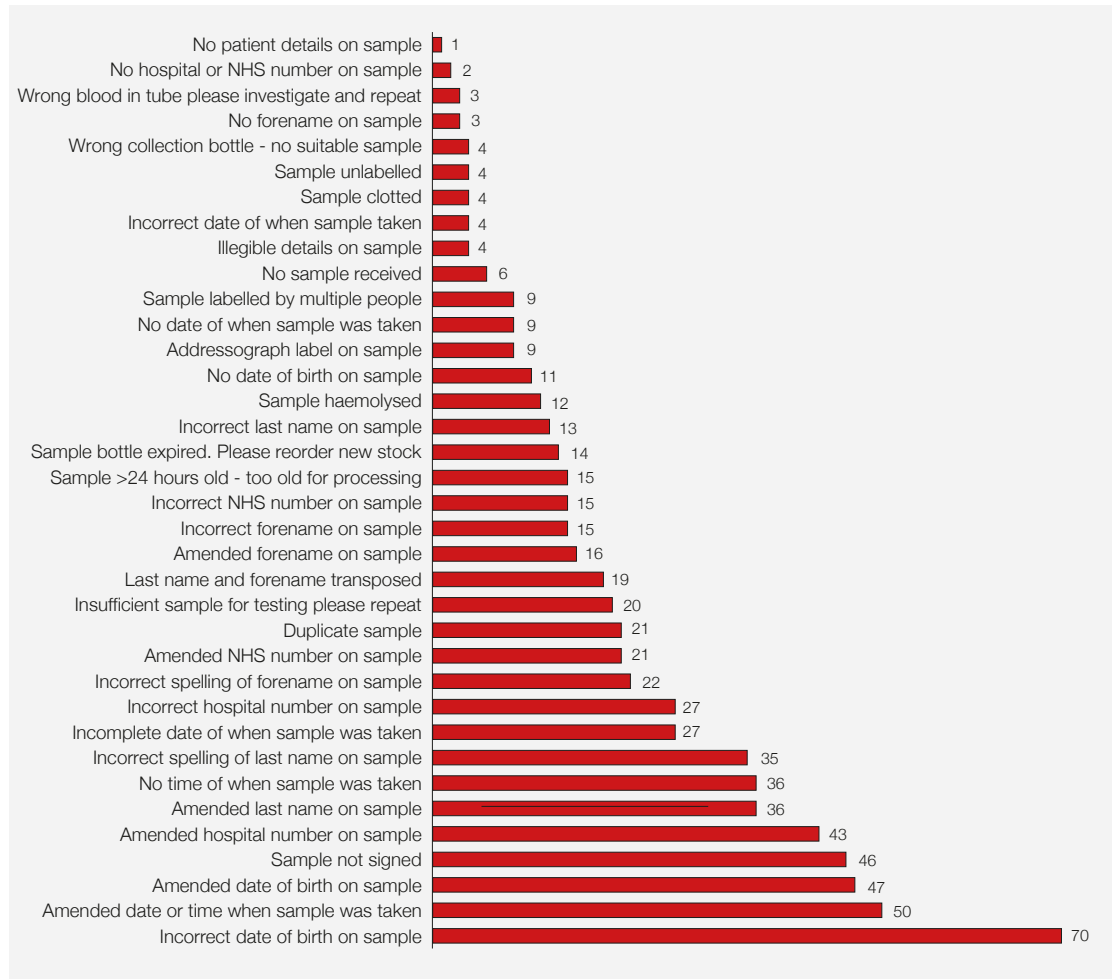
Sample processing errors (SPE) n=185

Following an increase in the numbers of SPE reports received, where discrepancies in sample labelling, forms and LIMS are not spotted when the sample is accepted into the laboratory, data has been obtained from a teaching hospital with a trauma centre to try and demonstrate the impact to the laboratory and resource from rejecting samples and investigating SPE. It is anticipated that readers will be able to assess the situation in their own laboratories to identify their own problems and solutions.

The rejection categories noted here reflect the hospital's own sample rejection policy and is not intended to demonstrate minimum compliance with British Society for Haematology (BSH) Guidelines. It should also be noted that a rejected sample is not reportable to SHOT unless it is a wrong blood in tube (WBIT) nor reportable to MHRA unless it is an SPE (see Appendix 2 for definition).

In 1 month alone, this hospital rejected 693 samples out of 7095 received, Figure 25.7

Figure 25.7:
Reasons for rejected samples from blood transfusion



The hospital's own data estimates the cost of each reject to be £13 (to obtain the repeat sample, the cost of the tube, venepuncture, transport, sample receipt and processing, disposal of the rejected sample, contacting clinical areas and reporting). Therefore, this hospital spends £9009 per month on average when dealing with rejected samples.

Furthermore, the hospital estimates that each rejected sample takes around 90 seconds to process (confirm it is to be rejected, book in, result with comment, call and leave details for the clinical area). Therefore, for 693 rejects, this hospital spends around 18 to 20 hours of laboratory time each month, simply processing rejects. This does not include the time taken for the clinical area to collect another sample.

This reporter reported 61 SPE reports in 2018, approximately 5 per month. For each sample error that is not picked up and results in a result or component release a Datix incident is raised and the following occurs.

1. Datix raised=5 minutes

- Log into Trust system
- Enter details of error
- Scan the request card and sample for evidence of the error

2. Transfusion practitioner (TP) team review and send out reflective statement request=10 minutes
 - Review type of error to ensure accuracy to Trusts reporting policy
 - Attach scanned evidence to Datix, including request card, sample image, audit log of staff involved
 - Ensure no impact to patient due to delay in transfusion
 - Email staff involved in the error attaching the witness statement
3. Staff involved in the error completing a review of their actions and sending back the witness statement – difficult to assess
4. Senior staff discussion with individual involved in the error=15-30 minutes
 - Review of the witness statement
 - Initial root cause
 - Recording onto trending spreadsheet
 - 1-2-1 discussion
5. Updating Datix system=20 minutes
 - Uploading statements and completing learning outcomes
 - Providing feedback to individuals in the system
6. Completing SABRE notification and footnotes etc.=10 minutes
 - Confirmation of incident
 - Loading of evidence
 - Additional footnotes if needed
 - Clarification of Trust Datix details and SABRE details and submit
7. Deliver training to individual if required=30-60 minutes depending on error
8. Incident review with clinical lead=5 minutes
9. Incident review with directorate governance=5 minutes

For each SPE, it is therefore estimated to take between 60 minutes to 2 hours to resolve, or 5-10 hours per month of laboratory time.

Finally, the monthly review meeting involves at least 3 senior BMS, a clinical lead, TP, manager and minute taker and can take 20 to 30 minutes, i.e. 2-3.5 hours of total staff time.

In conclusion, around 34 hours per month of laboratory time is spent dealing with rejected samples and investigating SPE in this hospital laboratory at a cost of just under £10,000. In summary, this example elicits the impact that this situation is having on the financial and human resource available at that hospital. It is understood that this case study may not reflect what is happening at every site but it does suggest that if sites carried out a fully joined up audit of the individual elements, both within the laboratory and the clinical areas, that impact on sample processing, resources could be allocated more effectively but more importantly possibly reduce the errors that occur.

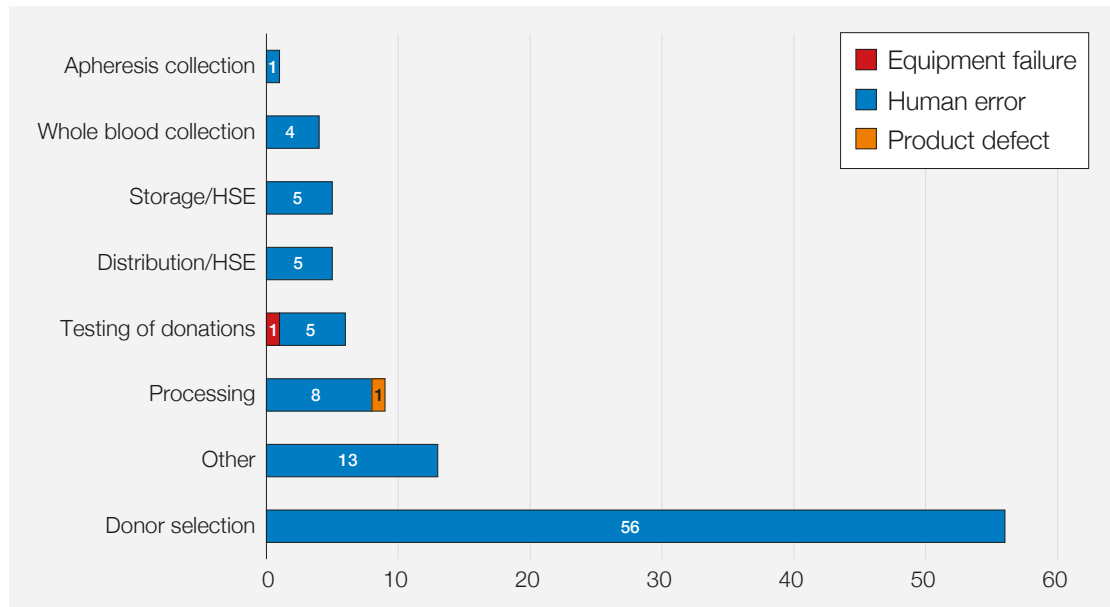
It is suggested that transfusion teams may want to adapt the principles of section 6.2 of the Good Practice Guide (GPG 2018) Collection of Blood and Blood Components to refer to the collection of patient samples.

Blood establishment reporting n=99 (-10)

The majority of SAE reports originate from hospital transfusion laboratories.

Although reports from blood establishments are included in the main analysis, the specific nature of the SAE reports from blood establishments are lost in the greater numbers of reported hospital transfusion laboratory SAE. Figure 25.8 displays the reported blood establishment SAE in 2018.

Figure 25.8:
Blood establishment SAE category by specification



HSE=handling and storage errors

The European Commission introduced a new category for reporting BE SAE last year, donor selection. This category covers the appropriate selection or deferral and collection from donors and the identification and set up of discretionary testing for travel or lifestyle reasons. These were originally captured in the whole blood and apheresis collection categories, but now they refer to the collection process only.

Considering the changes to the categories, the spread of reports is virtually identical to previous years. Analysis of the reports which fall into the donor selection category are almost always where failures with previous donations have been identified during the donor's current health check. Many of the errors identified have therefore occurred many months or years previously, involving staff who have left the BE or have little recall of the circumstances. These are therefore hard to investigate thoroughly, but CAPA will invariably involve checking the member of staff is aware of the error and can correctly perform the procedure now. Between the historic error occurring and the identification of the error, collection processes, training and education have been improved as a matter of continuous improvement anyway.

Assessment of the other category, Figure 25.9, shows that the biggest single category is incorrect blood component issued, where incorrect blood has been sent for specific patients and can be either crossmatched or uncrossmatched. Of the 7 reported, 4 of them identified improvements to the process of selection and issue, and one identified a training need in an individual.

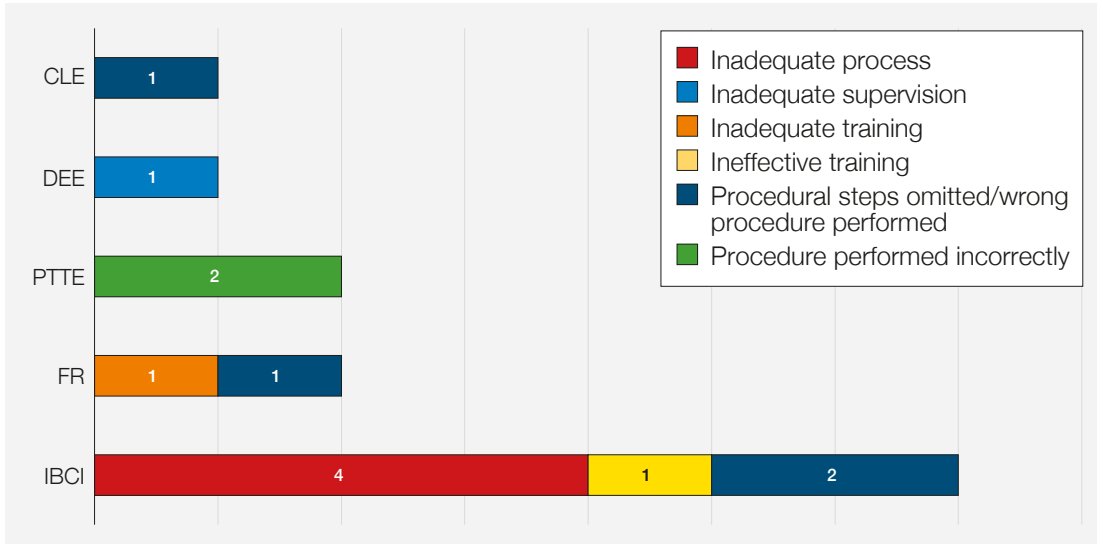


Figure 25.9:
BE reports in 'other' category

See Figure 25.4 for key to category abbreviations

Serious adverse reactions (SAR)

Definition: (BSQR 2005) an unintended response in a donor or in a patient that is associated with the collection, or transfusion of blood or blood components that is fatal, life-threatening, disabling or incapacitating, or which results in or prolongs hospitalisation or morbidity...blood establishments and the person responsible for the management of a hospital blood bank shall notify the Secretary of State (CA) of any serious adverse reactions observed during or after transfusion which may be attributable to the quality or safety of blood or blood components:

- (i) Collected, tested, processed, stored or distributed by the blood establishment, or
- (ii) Issued for transfusion by the hospital blood bank

Blood products

Adverse reactions involving blood products (i.e. licensed medicines such as anti-D immunoglobulin (Ig), Octaplas® (solvent-detergent fresh frozen plasma), or coagulation factor concentrates should be reported to the MHRA via the Yellow Card scheme (<http://yellowcard.mhra.gov.uk>).

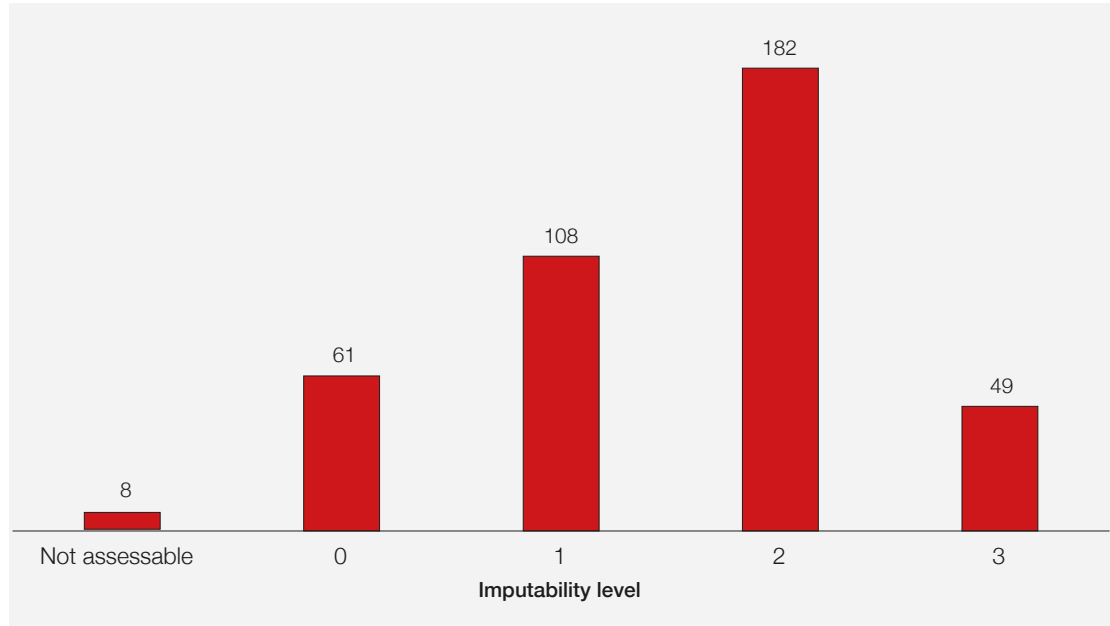
Summary of SAR report data

To avoid any confusion, the MHRA will only supply, in this Annual SHOT Report, total SAR figures reported to Europe, see Table 25.6.

	Imputability score				
	NA	0	1	2	3
SAR reports by imputability score	8	61	108	182	49

Table 25.6:
SAR reports, by imputability, reported to SABRE in 2018 (n=408)

Figure 25.10
SAR reports,
by imputability,
reported to
SABRE in 2018



Haemovigilance team managers update

Author: Mike Dawe

The MHRA recruited a new post of Haemovigilance Team Manager in March 2018.

The responsibilities of the post are designed to support the transfusion community in all aspects of the regulatory process that the CA is responsible for whilst ensuring the MHRA remain impartial. The aims of the post are to, provide help and support with QMS development design and maintenance through face to face meetings, workshops and strategies to further regulatory understanding.

The expected deliverables are:

1. Provide information whilst avoiding a conflict of interest relevant to BSQR
2. Provide advice and help within the regulatory framework
3. Create a communication flow where everybody can share success and failure between different sites (anonymised and with permission)
4. Keeping information both relevant, up to date, transparent but consistent and fair
5. Manage expectations of both the MHRA and the transfusion community
6. Removing cultural and fear factors associated with the regulatory process
7. Understanding the reporter's barriers and frustrations

Activity

Table 25.7:
MHRA
haemovigilance
team manager visits

MHRA haemovigilance team manager visits	
Hospital blood banks (HBB)/BE	16
Regional Transfusion Committees/Laboratory managers/TP meetings	11
Manufacturers	6
Total	33

Initial findings and recommendations

The following findings have been observed:

- Sites are taking a United Kingdom Accreditation Service (UKAS) International Organisation for Standardisation (ISO) 15189 approach to QMS management, especially if their laboratory has achieved or is preparing for UKAS accreditation, instead of following the good practice guide (GPG)

The MHRA inspect against the GPG and sites must therefore ensure that their blood transfusion QMS complies with these guidelines. While there are similarities between the requirements of ISO 15189 and the GPG in some areas, compliance with ISO 15189 alone will not be sufficient for a site to demonstrate compliance with MHRA requirements.

- Sites are stating that in blood transfusion (BT) UKAS are contradicting the MHRA in their QMS approach i.e. over reporting of incidents

These issues should be referred to the MHRA either through the Haemovigilance Team Manager and/or the GMP inspectors via gmpinspectorate@mhra.gov.uk.

- The blood compliance report (BCR) is confusing and there is a need for a more detailed guide on how to complete it

The BCR guidance document aims to provide sufficient instructions to support completion of the form without containing unnecessary details. We periodically review and update the guidance document in response to feedback, and where clarification is needed this can be requested from gmpinspectorate@mhra.gov.uk. As part of good practice obligations, sites should have appropriate systems and sufficient expertise to be able to provide the requested information.

- Loss of experienced staff in good practice principles
- Lack of available capacity and knowledge to balance operational need with MHRA compliance
- Lack of BT experienced BMS staff to fill vacant spaces

It is the responsibility of the sites executive management to ensure that the appropriately qualified and experienced staff are available to deliver the appropriate level of operational function within their blood transfusion departments. The relevant references within the GPG are, 1.2.2, 1.2.5, and 2.2. Sites are also responsible for ensuring that an effective capacity plan is put in place to demonstrate that the staffing level is enough to cover the workload including out-of-hours working and effective implementation of the quality management system. Where a shortfall is identified, senior management should act to ensure enough resource is available.

Sites are encouraged to contact the Haemovigilance Team Manager directly for any questions that they have regarding good practice principles or alternatively use the MHRA Forum to post their question and/or visit <https://www.gov.uk/guidance/blood-authorisations-and-safety-reporting> for relevant advice.

Summary

The initial feedback has been very positive and has helped sites and manufacturers understand their regulatory responsibilities.

These services can be accessed by everyone involved in blood transfusion including manufacturers to help support the protection of public health, maintain supply of blood and blood components and try to avoid the need for regulatory action.

For further information, contact the Haemovigilance Team Manager:

E-mail: Mike.Dawe@mhra.gov.uk

Office Telephone Number: 0203 0806239

MHRA inspection activity on hospital blood banks 2017-2018

Author: Shirley Stagg

A total of 304 BCR were submitted for review for the reporting period 01 April 2017 to 31 March 2018. Thirty-one HBB including four control sites were selected for inspection; this included sites under the oversight of the Inspection Action Group (IAG) and Compliance Management Team (CMT) following previous inspections.

All deficiencies identified at these inspections were referenced against the GPG for BE and HBB.

Inspection outcomes

Inspections for the reporting period 01 April 2017 to 31 March 2018 are performed in the following year, i.e. from 01 April 2018 to 31 March 2019. At the time of writing, a total of 24 inspections had been performed at 24 sites, and the numbers of deficiencies are as follows:

Table 25.8:
MHRA inspection
deficiencies

Critical	Major	Other
0	41	76

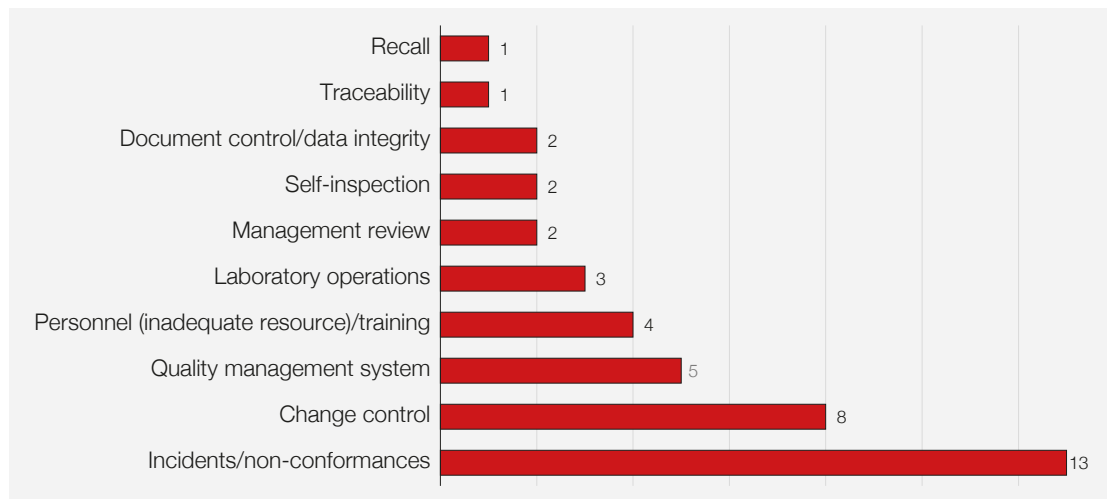
Three HBB had significant deficiency findings related to their operations and were escalated to the CMT. Common deficiency groups from these inspections included:

- Traceability
- Laboratory operations
- Change control and validation*
- Non-conformances/incident/events and CAPA implementation*
- Data integrity
- Self-inspection*
- Training*

Note those marked with * have been the most common deficiencies from inspections escalated to the CMT over the past 3 years.

An overview of the compliance management escalation processes used by the GMP inspectorate, including information on the IAG and CMT referral processes, is available from the MHRA inspectorate blog: <https://mhrainspectorate.blog.gov.uk/2017/02/06/overview-of-compliance-management-escalation-processes-used-by-the-gmp-inspectorate/>

Figure 25.11:
Categories of major
deficiencies found



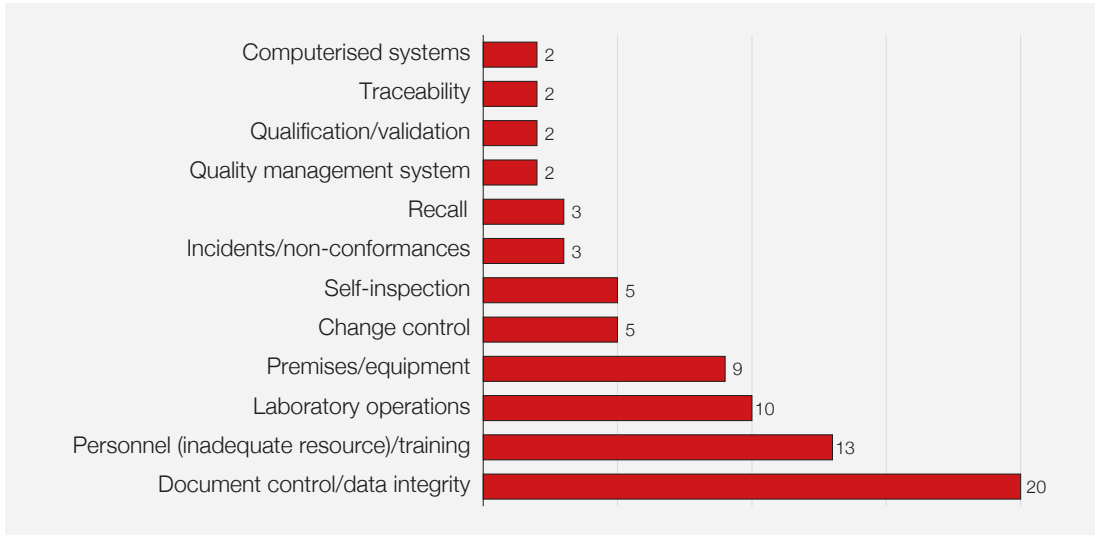


Figure 25.12:
Categories of
other deficiencies
found

Summary of significant issues identified at inspected sites

Quality management systems (QMS)

Senior management has the ultimate responsibility to ensure an effective quality system is in place, adequately resourced and that roles, responsibilities, and authorities are defined, communicated and implemented throughout the organisation. There should be periodic management review and monitoring both of its effectiveness, with the involvement of senior management and of the operation of the quality system. Evidence from inspections showed a lack of senior management review including a failure to identify actions to be taken (with timelines and responsibilities) to address poor performance of the QMS. Items frequently reported to senior management meetings included:

- Insufficient resource to maintain an effective QMS at the same time as ensuring service delivery
- Overdue document review
- Overdue CAPA including MHRA commitments
- Overdue competency assessments for laboratory staff
- Overdue self-inspections

Minutes from quality meetings frequently failed to acknowledge such failures in quality metrics and there were often no documented actions raised to address these issues.

Many transfusion laboratories did not have a system in place for senior management to authorise the formal extension of target dates for CAPA, self-inspection and change control. It is crucial that all overdue quality items should be discussed, and risk-assessed, on the impact caused by the delay in completing the agreed commitments.

Non-conformances/incidents/events

Incident investigations continue to be an area of concern and were the most frequent major deficiency raised during the 01 April 2018 to 31 March 2019 inspection cycle. Example deficiencies include:

- Investigations and root cause analysis lacked adequate depth, detail and scope
- Data from investigations and incidents were not routinely analysed to identify unfavourable trends that may require preventative action
- Where root cause analysis had been performed, the determined root causes were typically human error without adequate justification. This approach failed to ensure that other causes such as system, process and environmental issues were adequately reviewed

An appropriate level of investigation and root cause analysis should be applied during the investigation of incidents; this can be determined using quality risk management principles. There were several examples during inspection that showed that risk assessment did not form part of the procedure for managing non-conformances. Where Trust/Health Board level systems were used to report incidents, severity was frequently linked to the actual harm caused in the incident under investigation rather than the potential harm that the incident could cause. As such the potential for harm was not adequately addressed to guard against harm events in the future.

Change control management

The control of changes continues to be cited in a high number of major deficiencies. Examples of system weaknesses included:

- A failure to raise change controls for significant changes
- A failure to raise change controls at the time the change was proposed
- Lack of formal authorisation or approval of changes
- No user requirement specification (URS) for equipment facilities and systems to form a reference point for qualification and validation activities
- Quality risk management was not used to evaluate planned changes
- Risks that had been identified were not addressed before implementation of changes
- Lack of justification for deviations and failures during the execution of validation
- Significant delays were not authorised or impact assessed

Laboratory operations

Inadequate investigation of analyser internal quality control (IQC) failure continued to be a common finding. Little attention was given to establishing why the IQC had failed before process re-runs were initiated. A single passing repeat could be used to invalidate a failed test. Investigation to identify potential causes of failure was not always evidenced.

Other typical deficiencies seen included:

- Test cards and reagents were stored in unmonitored or poorly monitored locations
- Calibration reports for equipment used for measuring, weighing, recording and control were not reviewed and signed to show acceptance by the laboratory
- Thawer programmes were not validated for use with multiple units at the same time or for all types of components such as smaller paediatric units

Personnel/training/resourcing

Management has the responsibility to determine and provide adequately trained and competent personnel to carry out laboratory activities and to implement and maintain the QMS. The responsibilities placed on any one individual should not be so extensive as to present any risk to quality. There are examples from inspections that showed a failure to determine the required numbers of personnel during each shift in the HBB and no plan of the actions to take should levels fall below the requirements. The inadequate availability of personnel was evident in QMS metrics.

The lack of up to date training and competency records was a common finding during inspections. This applied to laboratory personnel and personnel involved in the distribution of blood components. Personnel awareness of new and updated procedures was often not well controlled with inadequate action being taken to address those individuals that did not acknowledge procedures in a timely fashion.

Consideration must be given to the training requirements of personnel that may work alone or with limited access to other trained individuals for example, overnight in the laboratory. Where procedures require a second check to reduce risk there must be an assessment in place to demonstrate how this risk will be mitigated when a second person is not available.

Documentation and data integrity

Poor documentation practice and data integrity remains the most cited 'other' deficiency. Examples of this included:

- Poor documentation practices such as blank fields, uncontrolled deletions, obliteration and overwriting
- Procedures not always recording all critical steps
- No audit trail functionality for electronic QMS
- Controlled documents overdue their review date
- Login details and access codes not stored securely

Recall

Most deficiencies associated with recall were around the lack of evaluation of the effectiveness of arrangements for recall and the recall system not being used for internal recalls.

Information and guidance

For further information on the MHRA and the regulation of blood please refer to the MHRA website: <https://www.gov.uk/topic/medicines-medical-devices-blood/blood-regulation-safety>.

The MHRA Blood forum was launched in June 2016 as a tool to help those involved in blood component collection, processing, testing and distribution to comply with the EU Blood Directives, UK Statutory Instruments and good practice requirements. It provides the ideal opportunity for extended communication between peers and allows users to put forward their comments and get 'real-life' examples of ways in which they can manage robust quality procedures that ensure compliance and which dovetail with their own business needs and resources. <http://forums.mhra.gov.uk/forumdisplay.php?60-Blood-Forum>.

References

BSQR (2005) The Blood Safety and Quality Regulations. <http://www.legislation.gov.uk/uksi/2005/50/regulation/1/made> [accessed 31 May 2019].

CIEHF (2019) Chartered Institute of Ergonomics and Human Factors: What is ergonomics? https://www.ergonomics.org.uk/Public/Resources/What_is_Ergonomics_.aspx [accessed 31 May 2019].

Council of Europe (2016) Good Practice Guidelines for blood establishments. <https://www.edqm.eu/en/good-practice-guidelines-blood-establishments> [accessed 31 May 2019].

Appendices

Appendix 1: Storage subcategories	Component expiry	A component has time-expired and not been removed from the storage location according to laboratory procedures
	Incorrect storage of component	A component has not been stored in the correct location
	Sample expiry	A sample has expired and the component has not been removed from the supply chain for the original patient
	Return to stock error	A component has been returned to the supply chain in error instead of being quarantined or discarded
	Failure to action alarm	A storage location alarm has been activated but not actioned according to the procedure
	Storage temperature deviation	The storage temperature has gone out of specification without an alarm being activated
	Security	A storage location is accessible to staff or public who are not authorised to do so
	30 minute rule	Red cells are returned to a refrigerator after 30 minutes have elapsed contrary to local procedures for return of unused red cells
	Miscellaneous	Any other storage event affecting the quality and safety of blood or blood components

Appendix 2: Other subcategories	Incorrect blood component issued (IBCI)	Blood issued which does not meet the patient's specific requirements
	Sample processing error (SPE)	Sample incorrectly receipted into the laboratory that should have been rejected
	Component labelling error (CLE)	Typically transposition of labels
	Pre-transfusion testing error (PTTE)	Any error in the process of testing patient samples and the interpretation of results
	Component collection error (CCE)	Any error in the collection of components from storage locations, or the handover of components on collection from the laboratory
	Data entry error (DEE)	Transcription errors of data, including both electronic and hand-written data
	Failed recall (FR)	Failure to recall components in a timely manner
	Unspecified (UNSPEC)	Any error affecting the quality and safety of components not specified elsewhere
	Component available for transfusion past de-reservation (CATPD)	Expired components which were incorrectly collected, prior to their scheduled re-stock by the laboratory
	Expired component available for transfusion (ECAT)	Any component issued for a patient, where the component expires prior to the planned transfusion
	Incorrect blood component ordered (IBCO)	Components ordered from a blood establishment that do not meet the patient's specific requirements
	Handling damage (HD)	Damage to a component affecting its quality and safety
	Incorrect blood component accepted (IBCA)	Blood accepted into a laboratory for a specific patient where the special requirements have not been matched

Procedure performed incorrectly	Failure to carry out a step(s) correctly
Procedural steps omitted/wrong procedure performed	Missing a key step or following the wrong procedure
Inadequate process	Inadequate design of a process
Incorrect procedure	Process not properly described in the SOP
Ineffective training	Training not understood by operator
Inadequate training	Training process not fit for purpose
Lapsed or no training	Carrying out a procedure without any formal training
Inadequate QMS – staffing and workload	Staffing levels below the minimum level, or unacceptably high workload has resulted in staff making errors. It is also important to consider an appropriate skill-mix when deciding on minimum staffing levels
Inadequate supervision	Errors have been made by trainees or inexperienced members of staff and should have been noticed by adequate supervision

**Appendix 3:
Human error
subcategories**