Handling and Storage Errors (HSE) n=311

10

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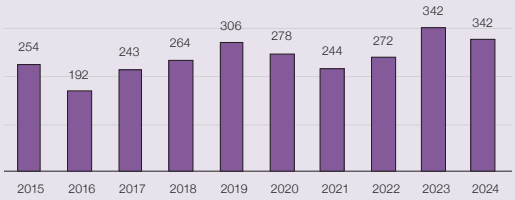
Headline data 2024

Number of reports n=311
Deaths n=0
Major morbidity n=0

HSE reports by year



Demographic data

Male n=154
Female n=152
Unknown n=5

Adults n=289
Paediatric n=20
Unknown n=2

Blood component data

Red cells n=247
Platelets n=31
Fresh frozen plasma (FFP) n=18
Cryoprecipitate n=7
Multiple components n=8

Key findings:

- Recurring error patterns in clinical and laboratory areas remain consistent with those observed in previous years
- Most clinical errors were technical administration errors and excessive time to transfuse
- Cold chain errors accounted for most of the laboratory HSE

Gaps identified:

- Mismatch between workload and staffing in the clinical area and the laboratory
- Inadequate training and gaps in competency assessments resulting in deficiencies in staff knowledge
- Inadequate equipment monitoring during transfusion with staff failing to notice or respond effectively to alerts within electronic blood management systems

Good practice:

- Near miss errors showed that cold chain errors and expired blood components are being identified in the pre-administration stage

Next steps:

- Review policies and procedures to ensure a check for transfusion administration rate is included
- The transfusion end time must be communicated during handover to staff caring for the patient
- Use of pumps for transfusions should be included in transfusion training programmes
- Blood giving sets should be clearly distinguishable from all other giving sets

For all abbreviations and references used, please see the **Glossary** and **Reference list** at the end of the full Annual SHOT Report. Please see the supplementary information on the SHOT website (https://www.shotuk.org/shot-reports/annual-shot-report-2024/).

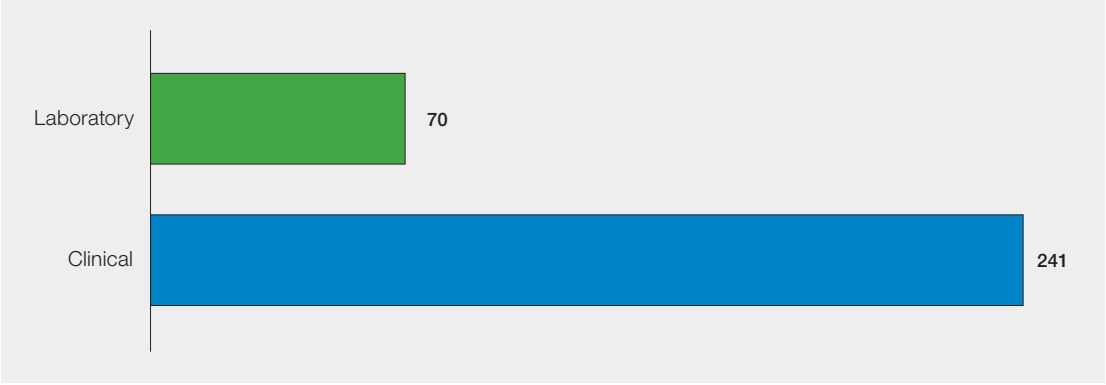
Definition:

All reported episodes in which a patient was transfused with a blood component or plasma product intended for the patient, but in which, during the transfusion process, the handling and storage may have rendered the component less safe for transfusion.

Introduction

There was a decrease in errors reported from 342 in 2023 to 311 in 2024. HSE accounted for 311/3998 (7.8%) errors in 2024 compared with 342/3833 (8.9%) in 2023. The variation between clinical errors, 241/311 (77.5%), and laboratory errors, 70/311 (22.5%), is illustrated in Figure 10.1 and reports are broken down by HSE category in Figures 10.2 and 10.3.

Figure 10.1: Breakdown of 2024 handling and storage error (HSE) reports (n=311)



There continues to be a mismatch between workload and staffing in both the clinical and laboratory areas. Data highlights that even though staff are trained, and competency assessed, similar trends continue. Inadequate training resulting in gaps in knowledge is once again seen in this Annual SHOT Report.

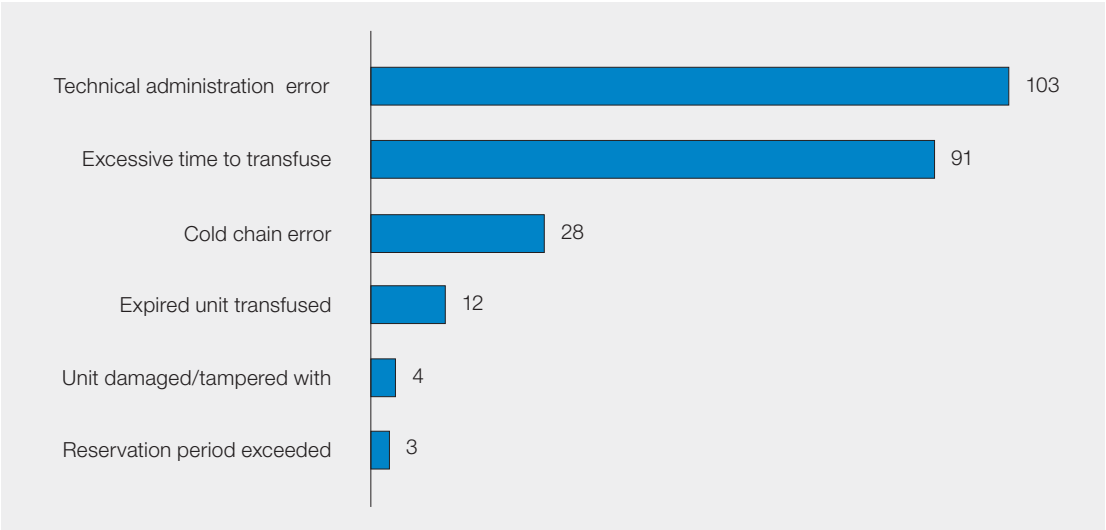
Deaths or major morbidity related to transfusion n=0

There were no deaths or major morbidity cases associated with HSE in 2024.

Clinical HSE n=241

The number of clinical errors has seen a slight fall (from 259 in 2023 to 241 in 2024) and there has been a decrease in technical administration errors, 103/241 (42.7%) in 2024 compared to 118/259 (45.6%) in 2023.

Figure 10.2: Breakdown of clinical HSE by category in 2024 (n=241)



Technical administration errors have been further categorised in Table 10.1.

Table 10.1: Clinical technical administration errors in 2024 (n=103)

Technical administration error	Number of cases
Pump programming error	72
Errors or defects with giving sets	24
Miscellaneous	2
Concurrent administration of IV fluids using the same venous access as blood administration	2
Manual drip rate incorrect	1
Prescribed too fast	1
No information provided	1
Total	**103**

There were 72 administration pump errors, 64/72 (88.9%) had a correct prescription but the pump had been set incorrectly. Of these, 11/64 (17.2%) stated that setting up of the pump was not included on the pre-administration checklist. There were 24/103 (23.3%) errors related to giving sets, this was a decrease from 39/118 (33.1%) reported in 2023. Of the 24 reported, 20 were due to the incorrect giving set being used.

Of the 91 excessive time to transfuse errors reported, 49/91 (53.9%) occurred within routine hours, 41/91 (45.1%) outside routine hours, and in 1 case the timing was not stated. There were 5/91 (5.5%) classified as an emergency transfusion, 29/91 (31.9%) as urgent, 49/91 (53.8%) were routine transfusions, and in 8/91 (8.8%) the priority was unknown or not stated.

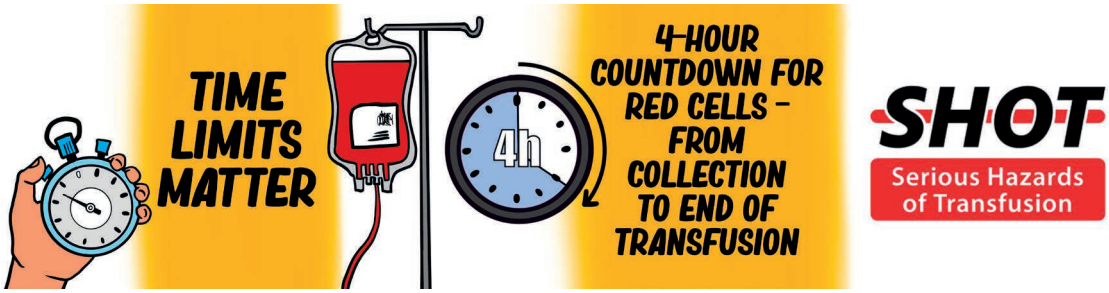
Case 10.1: Transfusion in progress for 7 hours 10 minutes

A unit of red cells was collected from the blood refrigerator at 13:02 and the transfusion was commenced at 13:09. After handover from the day shift to the night shift, it was realised that the red cell unit was being transfused for over 7 hours. The alarm on the pump was sounding, indicating that the bag was empty. The bag was taken down at 20:20.

On investigation there was a mismatch between workload and staffing at the time of the incident and a staff member involved had not fully completed their transfusion training.

Learning points

- Staff transfusion training should include the appropriate use of pumps
- Pump settings should be double checked against the prescription before commencing the transfusion
- Pre-administration checklists should include a check of the pump settings
- Staff handovers should include in progress transfusions and their scheduled finish time



Laboratory errors n=70

The number of laboratory errors have decreased to 70 in 2024 from 83 in 2023 and are broken down by HSE category in Figure 10.3. The majority were cold chain errors, 47/70 (67.1%) which have been further categorised in Table 10.2.

Figure 10.3: Breakdown of laboratory HSE by category in 2024 (n=70)

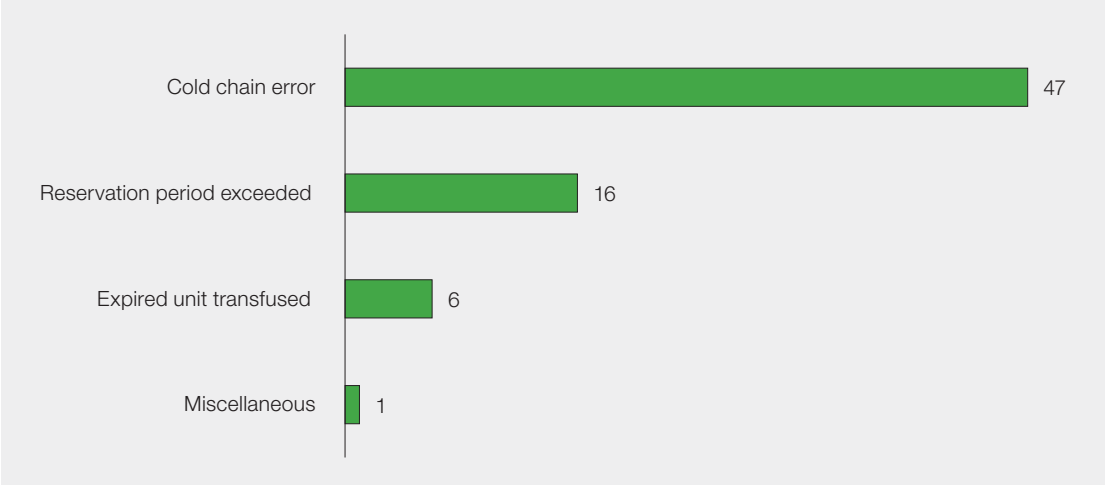


Table 10.2: Laboratory cold chain errors in 2024 (n=47)

Cold chain error	Number of cases
Refrigerator/equipment failure	20
Inappropriate return to stock	10
Incomplete cold chain	8
Transport and delivery	6
Inappropriate storage	3
Total	**47**

Of the 20 refrigerator/equipment failure errors, 15 resulted in the transfusion of a component which was confirmed to be outside of accepted temperature limits. In 5 cases the cold chain could not be confirmed. In 10 inappropriate return to stock errors, 7 resulted in the transfusion of a component which was confirmed to be outside of accepted temperature limits, and in 3 the cold chain could not be confirmed.

Case 10.2: Red cell unit transfused after the blood sample had expired

A unit of red cells remained in the blood issues refrigerator available for collection after the blood sample expiry had passed. A clinical staff member came to collect the unit from the refrigerator and the electronic blood management system (EBMS) alerted that the unit should not be transfused. The laboratory staff member did not understand the alert and continued to release the unit manually and it was then transfused to the patient.

On investigation it was identified that there was no competency assessment for the use of the EBMS and the standard operating procedure (SOP) was also not clear on how to deal with the alerts generated.

Learning points

- Competency assessments for laboratory staff should be reviewed regularly to ensure that they cover all laboratory processes
- Laboratory SOP should be clear and give clear instructions on how to deal with any system alerts/ alarms generated

Near miss n=132

There were 132 HSE near miss events in 2024, including 101/132 (76.5%) clinical errors and 31/132 (23.5%) laboratory errors. Clinical errors were mainly due to cold chain errors, 87/101 (86.1%), where units were stored in inappropriate conditions in the clinical area, 68/87 (78.2%). Laboratory errors were mainly due to expired units issued, 22/31 (71.0%) and 6 cold chain errors.

Conclusion

The findings overall remain consistent with previous years' Annual SHOT Reports. Handling and storage errors in transfusion can pose serious risks to patient safety and must be addressed through effective improvement actions. SHOT reinforces the message that all staff who participate in the handling and storage of blood components throughout the transfusion process should adhere to the correct procedures that are outlined in guidelines and their local transfusion policy. Transfusion policies must be based on the most current published guidance available (Robinson, et al., 2018).

Recommended resources

Patient Blood Management - Blood Assist app
Apple (https://apps.apple.com/gb/app/blood-assist/id1550911130)
Google play (https://play.google.com/store/apps/details?id=uk.nhsbt.bloodassist)
Web based (https://www.bloodassist.co.uk/)

NHS Institute for innovation and improvement Safer care SBAR Situation, Background, Assessment and Recommendation implementation and training guide
https://www.england.nhs.uk/improvement-hub/wp-content/uploads/sites/44/2017/11/SBAR-Implementation-and-Training-Guide.pdf

Cautionary Tales: Transfusion of damaged blood components
https://www.shotuk.org/resources/safety-alerts-and-safety-notices/cautionary-tales/