8 Human Factors and Ergonomics in SHOT Error Incidents n=3184

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Definition:

Human factors and ergonomics is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system.

Abbreviations used in this chapter

CAPA	Corrective and preventative actions
HFE	Human factors and ergonomics
HFIT	Human factors investigation tool
HR	Human resources
IT	Information technology
MHRA	Medicines and Healthcare products Regulatory Agency
NHS	National Health Service
NHSE	NHS England
PSIRF	Patient Safety Incident Response Framework
RCA	Root cause analysis
UKTLC	United Kingdom Transfusion Laboratory Collaborative
WBIT	Wrong blood in tube
YCFF	Yorkshire Contributory Factors Framework

Key SHOT messages

- It is encouraging to see a continued rise in the use of HFE frameworks for incident investigations and consideration of systemic contributory factors
- Within a restorative just culture, staff undertaking reflection as an action from investigations may limit learning and can be perceived as punitive
- Long-term actions to reduce risk (e.g., IT solutions, improved staffing) should continue to be considered with improvement plans in place even if they cannot be readily resolved

Recommendation

- Healthcare organisations should introduce and promote a restorative just culture, with buy-in from leadership at all levels. This shifts the focus from blaming staff to wider organisational learning, with the objective of repairing trust and relationships damaged after an incident

Action: Hospital senior management

Introduction

A good, learning, just safety culture in healthcare is vital to ensure patient and staff safety. It values transparency, encourages reporting of errors or near misses and prioritises staff training and support to prevent harm to patients. Just culture within many organisations remains retributive, organised around rules, policies and violations, thus becoming a blunt HR instrument, with no wider learning. In comparison, a restorative just culture is a learning approach to deal with adverse events, which focuses not on blame, but on controlling harm done and repairing trust and damaged relationships (Dekker, et al., 2022). Restorative just culture concentrates on impacts, needs and obligations (Table 8.1).

Table 8.1: Comparison of retributive and restorative just culture

Retributive just culture	Restorative just culture
What rule is broken?	Who is impacted?
How bad is the breach?	What do they need?
What should be the consequences?	Who is going to meet that need?
Employee has to settle/pay account	Get employee to tell/share account
Focuses on past and blame	Focuses on future
Accountable for compliance	Accountable for setting people up to succeed
Tries to stop things going wrong	Enhances capacities that make things go right
Meets hurt with more hurt	Meets hurt with healing

The table above is a summary taken from the work done by Sidney Dekker (https://sidneydekker.com/) and Mersey Care (https://www.merseycare.nhs.uk/restorative-just-learning-culture)

Mersey Care NHS Foundation Trust is widely acknowledged for being a centre of excellence and sharing their journey to create and maintain a restorative 'just and learning' culture where colleagues feel supported and empowered to learn when things do not go as expected, rather than blamed (Mersey Care NHS Foundation Trust, 2024). This approach has demonstrated some impressive outcomes, including improvements in staff retention, particularly important when organisations are faced with continuing workforce shortages. Key to improving culture at the organisation has been leadership buy-in at all levels, and the newly released NHS leadership competency framework for board members (NHSE, 2024) includes a competency domain specifically for skills and behaviours required to create a compassionate, just, and positive culture. In Wales, the National Policy on Patient Safety Incident Reporting & Management (NHS Wales Executive, 2023) supports a just culture for healthcare organisations and staff so they may feel encouraged to recognise, report and learn from patient safety incidents. It recognises that the exploration of incident reporting can facilitate healthcare organisations to share learning from incidents, help identify emerging risks and act as a mechanism for oversight and provide reassurance when substantial harm has occurred. Healthcare improvement in Scotland provides an overarching approach by advocating learning from adverse events through reporting and review – A national framework for Scotland (Healthcare Improvement Scotland, 2019). The principle of this overarching framework includes learning from adverse events, promoting good practice, a system focussed approach, promoting a just and safety culture and supports building on the fundamental values of care, compassion, respect, transparency, accountability, excellence, and teamwork. Northern Ireland have not adopted PSiRF but a patient safety incident framework, led by the Department of Health, is currently being developed.

The NHS England Patient Safety Incident Response Framework (PSIRF) (NHSE, 2023) has included compassionate engagement and involvement of those affected by patient safety incidents as a foundational pillar and thus offers promise of increased attention to restorative just culture within England's safety work (Lounsbury & Sujan, 2023). A checklist developed from Dekker's work on restorative just culture can be found on his website (Dekker, 2022).

Learning point

- Resources are readily available for organisations to use, such as Dekker's checklist and the Mersey Care website, to help implement a restorative just culture

Analysis of SHOT error reports in 2023 showed 'reflective learning' appears in almost 5% of cases (155/3184). The recommendation from the 2022 Annual SHOT Report that reflective learning should not be used as a stand-alone action remains pertinent, especially when developing a restorative just culture (Narayan, et al., 2023).

Case 8.1: Individual staff member was asked to reflect despite report showing wider staffing and organisational issues

A sample from a patient in ED grouped as O D-positive, historic group A D-positive. A WBIT incident was identified because the staff member who performed phlebotomy realised that they had bled the wrong patient and escalated to a senior clinician who informed laboratory staff. Due to workload pressures, the samples were labelled remotely from the patient with inadequate patient identification and patient notes from the neighbouring bed space were used. The ED had an operational escalation process in place due to extreme pressures. Patients were being seen on the ambulance corridor and there was only one nurse and one nursing assistant. The member of staff involved had to undergo retraining, competency-assessment, and completed a reflection tool.

The most important contributory factor in Case 8.1 was recorded in the HFIT as local working. The question regarding one thing to make this incident less likely to happen again, was answered with the need for an electronic end-to-end process for identifying patients prior to taking samples or administering blood. A staff member undergoing retraining and reflection is unlikely to impact the working conditions or the aspiration to secure an electronic system for sampling and administration. This mismatch continues to be observed regularly in incident reports and is incongruous with the principles of a restorative just culture.

To ensure a restorative just culture, it is essential to consider and question if the rules that staff are expected to follow are themselves 'just', and if the rule-makers understand 'work as done' rather than 'work as imagined'. Healthcare professionals face the challenge of navigating a maze of policies, striving to provide quality care while keeping up with an ever-expanding set of guidelines (Carthey, et al., 2011) making non-compliance a significant risk. Exploring this further, Johnstone (2017) surmised that it would take 2000 years for a USA anaesthetist to read all the relevant guidelines, and for these very reasons, a restorative just culture can fail. A just restorative culture cannot be fully implemented until staffing issues are addressed.

A joint SHOT and UKTLC Laboratory Safety Culture Survey was undertaken in November 2023 and the summary report and findings can be viewed on the SHOT website SHOT Surveys - Serious Hazards of Transfusion (shotuk.org). Concerning signals are evident from this safety culture survey and key recommendations have been provided to improve this. Organisations must encourage a just culture and have a clear strategy to listen to staff, support them, and actively work to create safe, positive work environments. This is not just about staff wellbeing, it is about ensuring the highest quality care for patients and promoting safe care.

Analysis of the SHOT HFIT

The SHOT HFIT was updated in January 2023 to remove scoring following an analysis shown in the 2022 Supplementary Information, Figure 7.4. https://www.shotuk.org/shot-reports/report-summary-and-supplement-2022/. This demonstrated that irrespective of scoring, the percentages given for each factor were almost identical. The updated tool asks reporters to answer yes or no for the contributory factors involved and provide any relevant information instead of providing a score.

A total of 3184 error cases were included in 2023, which is an increase in the error cases reported in 2022 (n=2908). Throughout SHOT's historical analysis of HFE, there has been evidence of an over-emphasis on individual behaviours, but analyses of both the 2022 and 2023 data showed an improved appreciation of system and organisational factors. Figure 8.1 shows consideration across the breadth of factors, with an increase of 14.4% attributed to situational factors and an increase of 5.1% to communication and culture. The increase in allocation of situational factors and decrease in local working, organisational and external factors compared to 2022 is slightly concerning as it may indicate that factors are being over-selected in the first category without full consideration of the other categories. As this has coincided with scoring being removed for 2023, the trend will be monitored to determine if any changes are required to the HFIT question set.

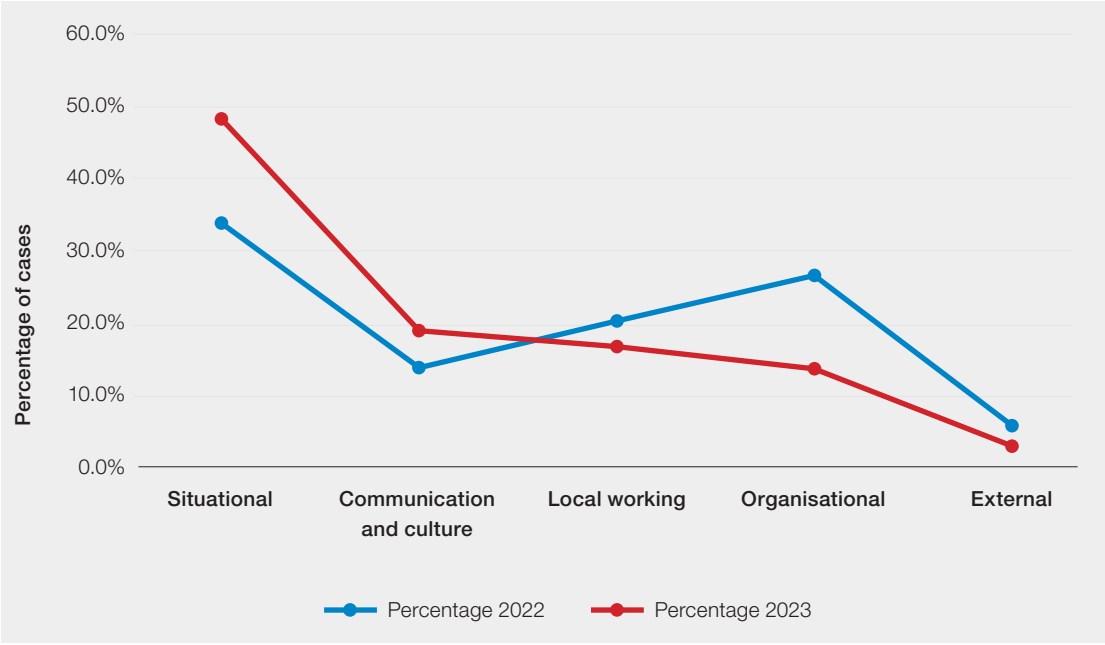


Figure 8.1: A comparison of HFIT categories assigned by SHOT reporters in 2022 and 2023

A recommendation was made in the 2021 Annual SHOT Report that 'a tried and tested human factors-based framework' should be applied to incident investigations. In 2023 2376/3184 (74.6%) cases specified that HFE principles or a framework/model was used to investigate incidents and a further 382/3184 (12.0%) indicated they were planning to in the future. Figure 8.2 shows this is a slight increase compared to 2022 (67.0% used, 14.7% planning) and 2021 (70.0% used, 12.8% planning) but these figures indicate that many cases are investigated without using a formal framework to consider human factors.

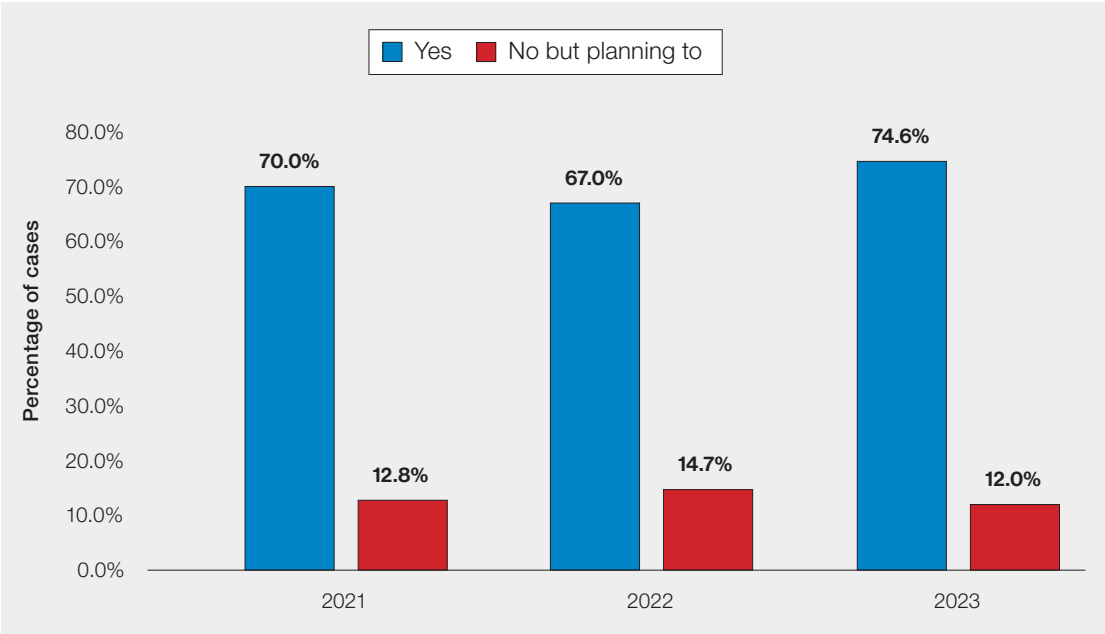
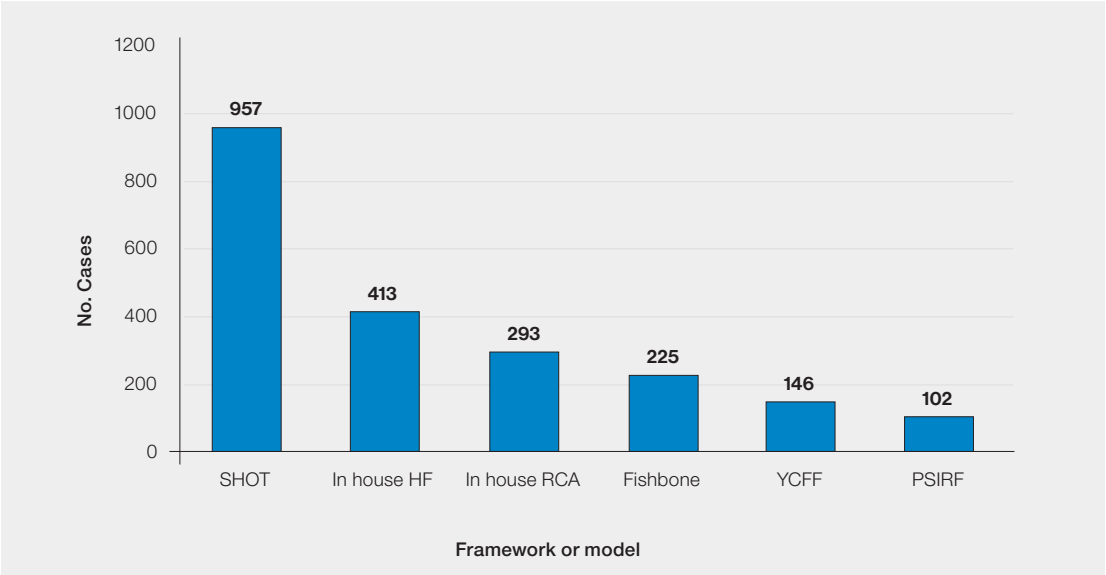


Figure 8.2: Percentage of cases investigated using HFE principles or framework

Of those using a HFE framework, 2227/2376 (93.7%) provided data about the type that was used. The most common response 957/2227 (43.0%) used the SHOT HFIT questions, which were adapted from the evidence-based YCFF framework (Improvement Academy, 2022) and 146/2227 (6.6%) used the YCCF framework, making it the fifth most commonly used. Figure 8.3 shows that apart from using SHOT questions, the top frameworks used were most commonly in-house HFE and RCA tools. It should be noted that it is an outdated concept to use RCA tools that encourage searching for a single root cause (Peerally, et al., 2017).

PSIRF was introduced in England in 2022 to replace the NHSE Serious Incident Framework and understandably, in that year, PSIRF was selected as the framework in only a handful of investigations, 14/1717 (0.8%). For 2023, this has risen to 102/2227 (4.6%) as organisations in England transition and implement the framework. A document is available to answer questions regarding the recording, reporting and investigation of transfusion-related adverse incidents following the introduction of PSIRF (see 'Recommended resources'). It remains important that SHOT-reportable incidents are fully investigated and in the case of MHRA-reportable incidents the BSQR requires an investigation of factors leading to the incident and appropriate CAPA (Department of Health, 2005).

Figure 8.3: Top six human factors frameworks used for incident investigation as submitted by SHOT reporters in 2023



HF=human factors; PSIRF= Patient Safety Incident Response Framework; RCA=root cause analysis; YCFF=Yorkshire Contributory Factors Framework

The SHOT HFIT questions, and the analyses in this chapter, are only included for reports in established error categories, but it can be demonstrated that some reaction cases may also be error-based. For the first time this year, a TACO case has been included in the supplementary information using the HFIT main headings to examine the significance of the HFE involved. This case can be found in the supplementary information on the SHOT website (https://www.shotuk.org/shot-reports/report-summary-and-supplement-2023/).

A general observation from the analysis of contributory factors provided in reports was that residual COVID-19 pressures remain apparent, affecting both workforce and processes. This has been demonstrated in Chapter 15, Laboratory Errors. A report on wider workforce and patient safety issues, including the impact of temporary staffing in England was published by the HSSIB in March 2024 (HSSIB, 2024).

Conclusion

It is vital that senior management in healthcare organisations recognise the importance of an understanding of HFE and that there is a growing evidence base, and thus business case, for introducing a restorative just culture. Within a restorative just and learning culture, the continued use of actions targeting individual staff members is unsuitable. Recognition and implementation of system-level interventions are paramount. Action plans should be in place to facilitate long-term interventions, such as vein-to-vein IT solutions, even if these actions cannot be easily closed on quality management systems.

SHOT
Serious Hazards of Transfusion

Recommended resources

SHOT Human Factors and Ergonomics (HFE) module
https://learninghub.nhs.uk/catalogue/NHSBT-Learning-Zone

SHOT Videos: Human factors videos
https://www.shotuk.org/resources/current-resources/videos/

SHOT Bite No. 1(a) and 1(b): Incident Investigation
SHOT Bite No. 12: Cognitive Bias
https://www.shotuk.org/resources/current-resources/shot-bites/

SHOTcast: Human Factors
https://www.shotuk.org/resources/current-resources/shot-casts/

SHOT Webinar: Human Factors
https://www.youtube.com/watch?v=ie0UK9R5IbM

Yorkshire Contributory Factors Framework
https://improvementacademy.org/resource/yorkshire-contributory-factors-framework/

Human Factors in Healthcare AI
https://ergonomics.org.uk/resource/human-factors-in-healthcare-ai.html

Patient Safety Incident Response Framework (PSIRF)
https://www.england.nhs.uk/patient-safety/incident-response-framework/

NHS HEE Patient Safety Syllabus
https://www.hee.nhs.uk/our-work/patient-safety

NHS Patient Safety Syllabus training programme
https://www.e-lfh.org.uk/programmes/patient-safety-syllabus-training/

NHSE: A just culture guide
https://www.england.nhs.uk/wp-content/uploads/2021/02/NHS_0932_JC_Poster_A3.pdf

SHOT Human Factors Tuition Package
https://www.shotuk.org/reporting/human-factors-tuition-package/

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