4 Key Messages and Recommendations

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Key SHOT messages

- **Making safe transfusion decisions and ensuring patients are well informed:** Transfusions are safe and effective when used appropriately. All staff involved in blood transfusions need to have relevant knowledge of the blood components appropriate to their role, indications for use, alternate options available, risks and benefits and possible reactions and their management. Unnecessary transfusions must be avoided, and patients or their carers must be informed about the risks, benefits, and alternatives to transfusions
- **Addressing transfusion errors:** Errors continue to be the source of most SHOT reports (83.1%). While transfusions are largely safe, errors can result in patient harm. Communication issues, assumptions and distraction compounded by staffing issues, ineffective and misuse of information technology (IT) and poor safety culture contribute to errors. Errors must be investigated using human factors principles-based incident investigations and appropriate improvement measures implemented
- **Ensuring clinical and laboratory transfusion teams are well resourced:** Adequate numbers of appropriately trained staff must be available to ensure safe transfusions; there should be contingency planning for staffing levels below a minimum level and for times of high workload. Safe staffing levels matched to the workload with well-resourced systems are vital for ensuring high quality care for patients and safety
- **Addressing knowledge gaps, cognitive biases, and holistic training:** Transfusion training with a thorough and relevant knowledge base in transfusion to all clinical and laboratory staff along with training in patient safety principles, understanding human factors and quality improvement approaches are essential. It is important that staff understand how cognitive biases and assumptions contribute to poor decision-making so that they can be mitigated appropriately
- **Policies and processes:** Policies, guidelines/decision-making aids and standard operating procedures need to be simple, clear, easy to follow and explain the rationale for each step. These should be up to date, accessible and reflect current national guidelines and recommendations. This will then ensure staff are engaged and more likely to follow and avoid any workarounds or deviations
- **Safety culture:** Fostering a strong and effective safety culture that is 'just, restorative and learning' is vital to ensure reduction in transfusion incidents and errors, thus directly improving patient safety. Staff should be able to confidently raise concerns, discuss issues and promote innovative ideas for improvement. Regular monitoring of the safety culture and impact on patient safety and staff wellbeing is strongly recommended to ensure timely improvement actions are implemented
- **Learning from near misses:** Reporting and investigating near misses helps identify and control risks before actual harm results, thus providing valuable opportunities to improve transfusion safety. The appropriate response to a near-miss with potential for high-risk transfusion event includes: (1) reporting to haemovigilance agencies as required, (2) investigate near miss, (3) develop and implement a corrective and preventive action plan and (4) monitor effectiveness of interventions
- **Shared care:** Clear, timely and comprehensive communication between all teams and hospitals involved in the patient pathway care is vital in ensuring patient safety. Robust and transparent processes must be in place for safe and effective transfer of information at all points in the patient care pathway
- **Investigating incidents and focussing on improvements:** Investigations must be systematic and thorough, using human factors principles and systems thinking, identifying systems-based corrective and preventive actions. Systemic and organisational problems should be fully investigated, as focusing on individual staff actions is unlikely to address the underlying systemic issues or lead to lasting improvements. Learning from the incidents should be shared widely

- **Safety checks before transfusions:** The pre-transfusion patient-side safety check provides a final opportunity for staff to identify errors ensuring the right component with the right specification is transfused to the right patient; the transfusion-associated circulatory overload (TACO) risk assessment facilitates appropriate mitigating measures in vulnerable patients at high risk of TACO. These checks serve as safety pauses to ensure staff safeguard patient well-being and prevent potentially life-threatening complications, these are not tick-box exercises
- **Patients as safety-partners**: Staff must ensure that they involve, engage, and listen to patients as 'partners' in their own care, including transfusion support. Engaging patients, their families, and carers as 'safety partners' helps co-create safer systems, identify, and rectify preventable adverse events

Transfusion safety is a critical aspect of modern healthcare and warrants a systematic approach to minimise risks and optimise patient outcomes. Signals from haemovigilance reports do more than highlight transfusion-specific issues; they mirror the broader challenges facing patient care across the entire healthcare system. These insights reveal systemic weaknesses, lapses in communication, strains on workforce capacity that affect safety and quality at every level. They are not isolated concerns, but symptoms of deeper, widespread pressures that demand urgent actions.

This Annual SHOT Report highlights continuing error trends with 83.1% reports related to preventable errors. Worsening trends in reported transfusion delays, laboratory errors and TACO are concerning. Analysis of reported cases continue to highlight gaps in our systems. It is time for urgent, co-ordinated, system-level action to embed a culture of safety, addressing identified issues and ensuring every transfusion is as safe as possible. It is imperative that healthcare leaders, policy makers, and frontline teams unite in transforming transfusion practice, because patients and staff deserve nothing less.

Roadmap to enhance patient safety

The Patient Safety Commissioner in England published the Patient Safety Principles in October 2024. These were developed as one of the Commissioner's statutory duties following a public consultation which received over 800 responses. They provide a framework for decision-making, planning and collaborative working with patients as partners in a just and learning culture and are for everyone working in the healthcare system (Patient Safety Commissioner, 2024).

Figure 4.1: Patient Safety Principles set out by the Patient Safety Commissioner, England

The key safety messages and recommendations from SHOT over the years align with the principles advocated by the Patient Safety Commissioner. We put patients first by listening, learning, and acting; every voice matters, every incident teaches and every action counts for safer care.

Worsening healthcare challenges in the United Kingdom (UK) and the National Health Service (NHS) in crisis also provides an opportunity for innovation and act as a catalyst for change. This requires adaptive leadership with healthcare leaders being able to:

- Anticipate likely future needs, trends and options
- Articulate these needs to build collective understanding and support for action
- Adapt so that there is continuous learning and adjustment of responses as necessary and
- Accountable, including maximum transparency in decision-making processes and openness to challenges and feedback (Sott & Bender, 2025; Ramalingam, et al., 2020)

The UK government recently announced that it planned to abolish NHS England and move many of its functions back into the Department of Health and Social Care. While streamlining processes, reducing duplication, increasing savings, and improving productivity have been identified as key drivers for this restructuring, the prioritisation of patient and staff safety must remain paramount (Wise, 2025). Transformations in structure, governance or service delivery should be designed and implemented in ways that protect and strengthen safety. Changes may be necessary, but safety should be paramount. Clinical leadership is critical during change; it keeps patient care at the centre, bridges the gap between strategy and reality and ensures safety, quality and compassion aren't lost in the process. As has been repeatedly highlighted, changes and decisions in healthcare should be clinically led with evidence-based decision-making.

A recent white paper on patient safety from the International Society for Quality in Health Care (ISQua) provides a practical, evidence-informed, structured roadmap for healthcare organisations to enhance patient safety and embed continuous improvement into daily operations (ISQua, 2025). The framework is aligned with the World Health Organisation Global Patient Safety Action Plan (GPSAP) 2021–2030 (WHO, 2021). The white paper outlines four foundational pillars for improving patient safety in healthcare organisations:

1. Advocacy and leadership – prioritising patient safety in hospital policies and governance.
2. Health worker education and safety – empowering healthcare professionals through training and well-being initiatives.
3. Patient, family, and carer engagement – encouraging collaboration between healthcare providers and patients.
4. Improvement in clinical processes – implementing evidence-based practices to reduce preventable harm.

This framework aims to create practical, scalable solutions that can be applied across diverse healthcare settings, ultimately improving patient outcomes and staff satisfaction.

Recommendations from the Infected Blood Inquiry (IBI) Report and SHOT

The IBI highlighted several failures in ensuring safe transfusion practices, which led to thousands of infections with human immunodeficiency virus (HIV) and hepatitis C (IBI, 2024). The contaminated blood crisis serves as a stark reminder of the importance of safety in transfusion. Implementing the wide-ranging recommendations from the IBI report can safeguard healthcare systems and prevent similar tragedies. It is incumbent upon all of us not to squander this opportunity to turn the hard lessons of the IBI into action, embed its recommendations and strengthen transfusion safety. Safety isn't just a policy; it is a shared responsibility and a commitment to protect patients and providers. SHOT has been working with various stakeholders across the UK, seeking practical solutions to implement the recommendations from IBI and addressing longstanding issues (such as staffing, laboratory safety, IT) that pose risks to safety, fostering a culture of continuous improvement and shared responsibility.

One of the key IBI recommendations under 7. Patient Safety: Blood Transfusions was related to the implementation of SHOT recommendations. The recommendation states:

(e) That all NHS organisations across the UK have a mechanism in place for implementing recommendations of SHOT reports, which should be professionally mandated, and for monitoring such implementation.

SHOT Transfusion Safety Standards

In view of similar recurring themes in the recommendations in serial Annual SHOT Reports, SHOT Transfusion Safety Standards have been produced and are being released in 2025 following feedback from key stakeholders. These standards cover fundamental principles to ensure safe and effective transfusions by identifying risks, as well as implementing strategies that create a safer environment for everyone involved. These are intended to contribute to better patient outcomes, staff wellbeing and overall system safety. The transfusion safety standards cover all aspects of the SHOT 10 steps for blood component handling and use (SHOT, 2024). It is important to recognise that local improvement plans must be identified and implemented to address any non-compliance with any of these standards to optimise transfusion safety. It is expected that compliance against each of these standards can be recorded locally as either fully compliant/partially compliant or non-compliant with an action plan to address gaps when not fully compliant. This would also facilitate benchmarking between organisations.

The transfusion safety standards are aligned with the fundamental pillars for improving patient safety that have been highlighted in the ISQua white paper (ISQua, 2025). Having transfusion safety standards and ensuring compliance are key to improving safety. Standards provide the 'what' and the 'how' and compliance ensures they are actually used in practice. They are intended to help:

- Create a clear baseline for safety: standards define what 'safe' looks like, providing staff with a consistent reference point for best practice
- Reduce variability and prevent errors: when staff follow the same protocols, there is less room for mistakes caused by inconsistent procedures
- Enable early detection of risks: compliance checks and audits can uncover unsafe practices or system weaknesses before they lead to harm
- Promote a culture of accountability and learning: knowing that standards are in place and monitored encourages teams to take responsibility and continuously improve
- Improve trust and transparency: patients and families may feel safer when they know care teams are following recognised safety standards

Implementing these safety standards and ensuring compliance transforms transfusion safety from a reactive process into a proactive system. Regulatory bodies such as the Care Quality Commission or equivalent play a critical role by monitoring and inspecting healthcare providers, enforcing accountability, driving transparency and public trust.

Further information and the standards can be accessed on the SHOT website (https://www.shotuk.org/transfusion-safety-standards/).

Recommendation

- All healthcare organisations should systematically identify gaps in transfusion safety by benchmarking practices against the SHOT Transfusion Safety Standards, implement targeted corrective measures and actively monitor compliance through structured audits and performance indicators

These SHOT Transfusion Safety Standards do not replace but complement other regulatory or best practice recommendations for safe transfusions (Department of Health, 2005; BSH, 2025; SHOT, 2025a; NICE, 2016). These standards provide a framework for peer review/self-assessment, compliance check by regulatory organisations and/or national oversight. Where inspection against the SHOT safety standards show deficiencies, organisations may be requested to demonstrate compliance with these other transfusion requirements. Additional drivers for developing these safety standards include Lord Darzi's report and the Health Services Safety Investigations Body (HSSIB) report released in 2024

(Department of Health and Social Care, 2024; HSSIB, 2024). Transfusion safety standards will help drive improvement actions to minimise risks, maintain reliability, ensure effectiveness of transfusions, and optimise safety for all.

Transfusion governance within hospitals

Following discussions as part of the IBI recommendations implementation, a framework for effective transfusion governance within hospitals in the UK addressing existing gaps has been drafted and is being reviewed by a wide range of stakeholders. This framework will ensure adequate support for transfusion staff, provide an effector mechanism to ensure compliance with the transfusion safety standards, support integration with existing patient safety governance framework and facilitate adequate oversight. Insights from infection prevention and control as well as maternity safety governance systems helped inform this transfusion governance framework which will be released later this year. Effective governance frameworks are the backbone of safe, high-performing systems and drive accountability, enable benchmarking and ensure safety standards and regulatory requirements aren't just met, but meaningfully upheld.

Patient consent and shared decision-making

The Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) consent guidance has been reviewed, and an updated guidance is expected to be released shortly (SaBTO, 2020). The 2024 National Comparative Audit of NICE Quality Standard QS 138 results highlight ongoing issues with patient consent and shared decision-making (NHSBT, 2025a). Poor consent practices including poor documentation of the discussions with patients and families result in patients not being fully aware or informed of the risks, benefits or available alternatives, particularly in non-emergency settings. There is an urgent need to strengthen communication, embed shared decision-making into practice and ensure that consent is a meaningful, ongoing dialogue with appropriate use of transfusions. SHOT, working with patient representatives and other key transfusion stakeholders, has been also leading on the development of a MyTransfusion mobile application which will provide generic information about transfusions in adult recipients. The content of the app is based on national guidelines and reflects the UK-wide transfusion patient information leaflets which will help patients and families to review and assimilate information in their own time. The app and a browser version are now available. A driver diagram has also been developed to support the identification of local issues related to consent and shared decision-making; this can be used to map out tangible improvement actions to address gaps and enhance safety (see 'Recommended resources').

Laboratory safety

The IBI report also highlighted the importance of optimising laboratory safety to support safe transfusions. Laboratory safety in transfusion practice is a cornerstone of patient care, yet it is often overlooked. Concerning signals in this Annual SHOT Report have highlighted a steep increase in laboratory errors leading to unsafe transfusions emphasising the critical need to improve laboratory safety. These incidents continue to occur due to systemic issues such as understaffing, high workloads, inadequate training, and poor leadership/safety culture. Serial UK Transfusion Laboratory Collaborative (UKTLC) surveys have highlighted these issues (SHOT, 2025b). A safe, supported laboratory team is essential to ensure every blood component is tested, stored, and issued appropriately contributing to saving lives without compromise. The urgency to address these challenges cannot be overstated. Strengthening laboratory safety requires a culture of vigilance, robust training, optimal staffing, and a commitment to continuous improvement. For more information about laboratory cases, see Chapter 17, Laboratory Errors.

Cyber incidents and impact of blood stock issues on transfusion safety

A total of 43 reports included in this Annual SHOT Report were related to a cyber-attack incident in London during 2024. The majority of these, 36/43 (83.7%) occurred in laboratory areas, mostly related to component labelling, 22/36 (61.1%). Errors resulting from this cyber incident affected all steps in the transfusion pathway and incidents occurred in several SHOT reporting categories. Near misses

accounted for the highest number of reports, 19/43 (44.2%) but errors were reported resulting in transfusion delays (5), incorrect blood components transfused (7), anti-D Ig errors (4) and right blood right patient reports (8). These have been covered in the respective chapters in this Annual SHOT Report. It is important to note that such cyber-attacks on healthcare systems are not just IT failures, they are critical patient safety incidents. When hospital networks are compromised, the consequences are immediate and severe. Delayed surgeries and appointments with disruptions to patient care including transfusion support (NHSE, 2024; BBC, 2024). These attacks expose the vulnerabilities in our digital infrastructure and highlight a broader issue of lack of preparedness. This is a wake-up call and there is an urgent need to invest in secure, modern IT systems, implementing robust cybersecurity protocols, training staff, and developing clear, tested reliable incident response plans. Patient safety depends on effective cybersecurity, a core component of safe, high-quality healthcare.

The blood stock shortages in the last few years are a stark reminder of fragility and finiteness of the blood supply (NHSBT, 2024; NHSBT, 2025; Chowdhury, et al., 2024). Multiple factors have been identified as being contributory including seasonal donation dips, increased demand, and impact of the cyber-attack that disrupted pathology services. This highlights the need to strengthen the donor base with a more resilient and diverse donor pool and using blood wisely. UK Blood Services have been addressing this issue and are proactively engaging the public and under-represented donor populations, evaluating methods to improve donor retention, and addressing barriers to donation. Shortages underscore the importance of appropriate transfusion practices, using evidence-based guidelines, adhering to restrictive transfusion thresholds where safe, and promoting alternatives to transfusion where possible. Avoiding unnecessary transfusions will help conserve stock and improve patient outcomes. Preventing blood wastage will also help conserve limited stock, ensuring availability for patients when it's most needed.

Optimising staff wellbeing and safety

Staff wellbeing and safety are the foundation of a safe, high-performing healthcare system. When staff feel supported and valued, they are better able to focus, make sound decisions and provide compassionate care. Burnout, stress, and unsafe working conditions undermine both morale and patient safety. By urgently prioritising wellbeing and safety of our healthcare workforce, both clinical and laboratory, we strengthen the very heart of patient care and create an environment where excellence can thrive.

The annual NHS staff survey, one of the largest workforce surveys in the world, asks NHS staff in England about their experiences of working for their respective NHS organisations. The 2024 survey provides valuable insights into the experiences of over 700,000 people working in the NHS in autumn 2024 and highlights key trends in staff wellbeing, fatigue, and safety, showing both progress and ongoing challenges (NHSE, 2025).

A few key aspects from the 2024 NHS staff survey related to staff wellbeing, fatigue, safety and support are included here:

- Staff wellbeing: while overall wellbeing scores remained stable compared to 2023, 41% of staff reported work-related stress, a figure that remains high despite improvements since 2021
- Fatigue and presenteeism: nearly 56% of staff reported coming to work despite feeling unwell, indicating ongoing concerns about burnout and workplace pressures
- Safety and support: the health and safety climate indicator showed that 71.5% of staff felt supported by their line managers, a slight improvement from previous years (NHS Employers, 2025)

Insights from such staff surveys provide valuable data that can be used to enhance workplace wellbeing, address fatigue-related risks, and improve patient safety by shaping policies that support staff resilience and sustainable working conditions. It is vital to recognise that such staff surveys are more than feedback tools. Listening is just the start; real value comes from translating insights into visible, meaningful improvements that shows staff their voices matter.

Staff fatigue

A recent report from the Health Services Safety Investigations Body in England highlighted the adverse impact of staff fatigue on patient safety (HSSIB, 2025). Staff fatigue is not routinely captured as part of

patient safety event reporting or routinely considered as part of patient safety event learning, or other governance processes. The report also highlighted that there is limited regulatory and national oversight of the risks posed to patient safety by staff fatigue in healthcare. One of the key safety recommendations from this report is that NHS England/Department of Health and Social Care identifies and reviews any current processes that may capture staff fatigue related data. The staff fatigue data will help inform the development of any future strategy and action to address this risk and its impact on patient safety. Caring for staff is caring for patients; safety and wellbeing must start with the people who deliver care.

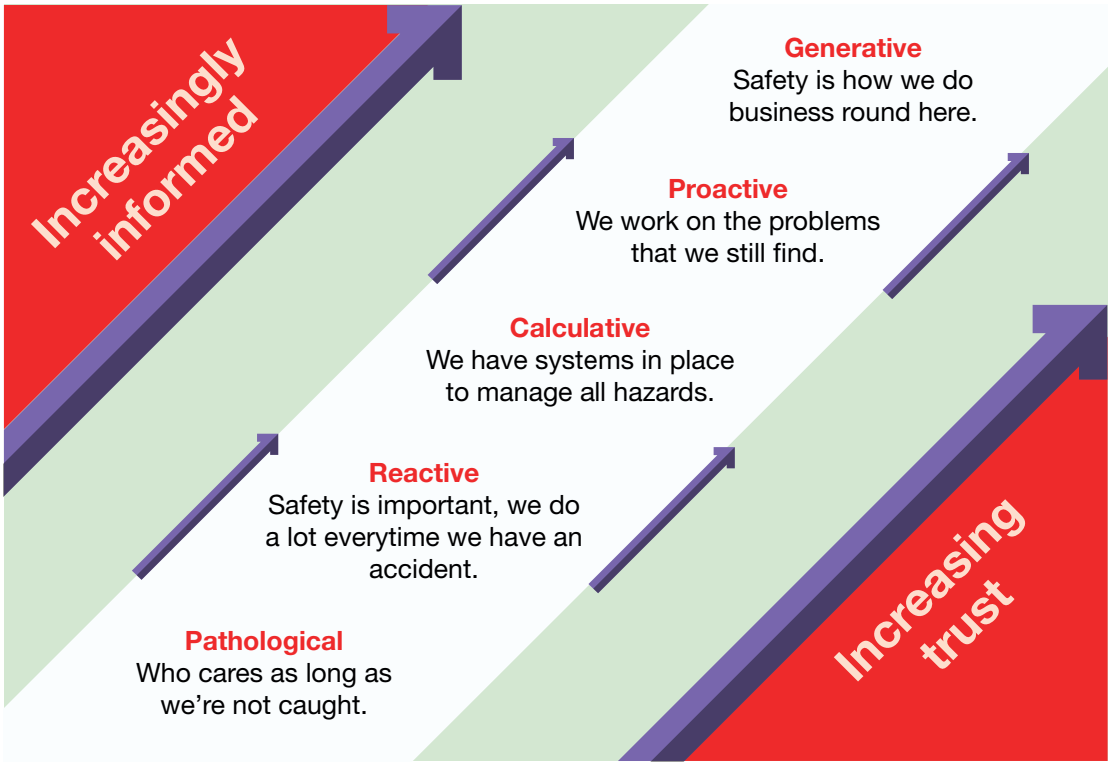
A white paper on 'Fatigue risk management for health and social care' from the Chartered Institute of Ergonomics and Human Factors highlights a chronically fatigued workforce due to several factors including staffing issues and high workload. It provides a foundation for national health and social care bodies to recognise the risk that staff fatigue poses to safe and efficient healthcare services and advocates a systemic approach to managing these risks (CIEHF, 2024).

The SHOT Human Factors Investigation Tool explores staff fatigue as one of the contributory factors for transfusion incidents. Collecting these data will help understand the issue better and identify measures to address this effectively.

Safety culture

Fostering a strong and effective safety culture is vital to reducing transfusion incidents and errors, thereby directly improving patient safety. This has been one of the key recommendations from SHOT (Narayan, et al., 2022). A just, restorative, learning safety culture is critical with good communication between healthcare leaders, managers, and staff. Professor Patrick Hudson aptly says, 'What costs money is not safety but bad safety management' (Hudson, 2001). Organisations can be distinguished along a line from pathological to generative safety culture as shown in Figure 4.2.

Figure 4.2: The evolution of a safety culture



Adapted from Hudson, P., 2001. Safety culture: The ultimate goal. Flight Safety Australia, pp. 29-31.

Any change to safety culture within organisations takes time and effort. But it is imperative that all healthcare leaders promote a just, learning safety culture with a collective, inclusive, and compassionate leadership. Effective leaders must ensure staff access to adequate training, mentorship, and support.

All staff in clinical and laboratory areas have a responsibility to speak up in case of any concerns and help embed the safety culture in teams.

Conclusions

The SHOT Transfusion Safety Standards provide a structured and consistent approach to maintaining safety. These will help create lasting changes by embedding safe practices into daily operations, making them part of organisational culture. Standards will help establish clear benchmarks, support regulatory checks, facilitate tangible improvements, and foster accountability among healthcare providers. The standards help address known risks systematically and support organisations to allocate resources effectively by prioritising essential safety measures. Robust and reliable transfusion governance within hospitals is fundamental to ensure compliance with these standards.

Worrying signals in this Annual SHOT Report stand as a stark reminder and a clear warning: the current state of our healthcare systems is not just unsustainable, it is unsafe. Without urgent, decisive actions to improve systems and practices, we continue to place both patients and staff at unacceptable risk. The warning signals are flashing red, and the time for complacency has long passed. We must act now to restore safety, rebuild trust, and reform our systems that are failing those they are meant to protect. Patient safety must remain a non-negotiable priority.

Recommended resources

SHOT Transfusion Safety Standards
https://www.shotuk.org/transfusion-safety-standards/

Patient information page with relevant resources from the SHOT website
https://www.shotuk.org/patients/

Transfusion information for patients on the JPAC website
https://www.transfusionguidelines.org/transfusion-practice/consent-for-blood-transfusion/consent-information-for-patients

UKTLC surveys
https://www.shotuk.org/resources/uktlc-surveys/

National Comparative Audit: 2024 Audit of NICE Quality Standard QS138
https://hospital.blood.co.uk/audits/national-comparative-audit/reports-grouped-by-year/2024-national-comparative-audit-of-nice-quality-standard-qs138/