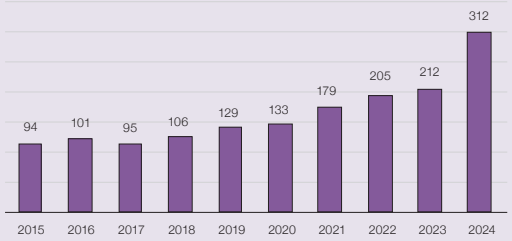
11 Delayed Transfusions n=312

Authors: Josephine McCullagh, Paula Bolton-Maggs and Vera Rosa

Headline data 2024

Number of reports n=312
Deaths n=18
Major morbidity n=12

Delayed transfusion reports by year



Demographic data

Male n=132
Female n=179
Unknown n=1
Adults n=282
Paediatric n=30

Blood component data

Red cells n=214
Platelets n=47
Fresh frozen plasma (FFP) n=9
Cryoprecipitate n=2
Solvent-detergent FFP n=1
Granulocytes n=1
Multiple components n=38

Key findings:

- There was a striking increase in the number of delays particularly in the laboratory
- There was an increase in the number of serious adverse patient outcomes
- Transfusion delays in major haemorrhage (MH) continue to rise

Gaps identified:

- Communication failures were the most frequently cited issue, affecting decision-making, blood component requests, and sample processing
- Lack of training, understaffing, and unfamiliarity with emergency protocols significantly impacted transfusion response times in both clinical and laboratory areas
- Failure to effectively implement major haemorrhage protocols (MHP)
- Many delays resulted from failure to identify and escalate cases early, leading to late transfusion initiation

Good practice:

- Increased levels of recognition of delays and reporting of such events
- Improved staff awareness
- Increasing recognition of causal and contributory factors that can help improve safety

Next steps:

- Ensure recommendations from the Central Alerting System (CAS) patient safety alert: Preventing transfusion delays in bleeding and critically anaemic patients (SHOT/2022/001) are fully implemented

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/).

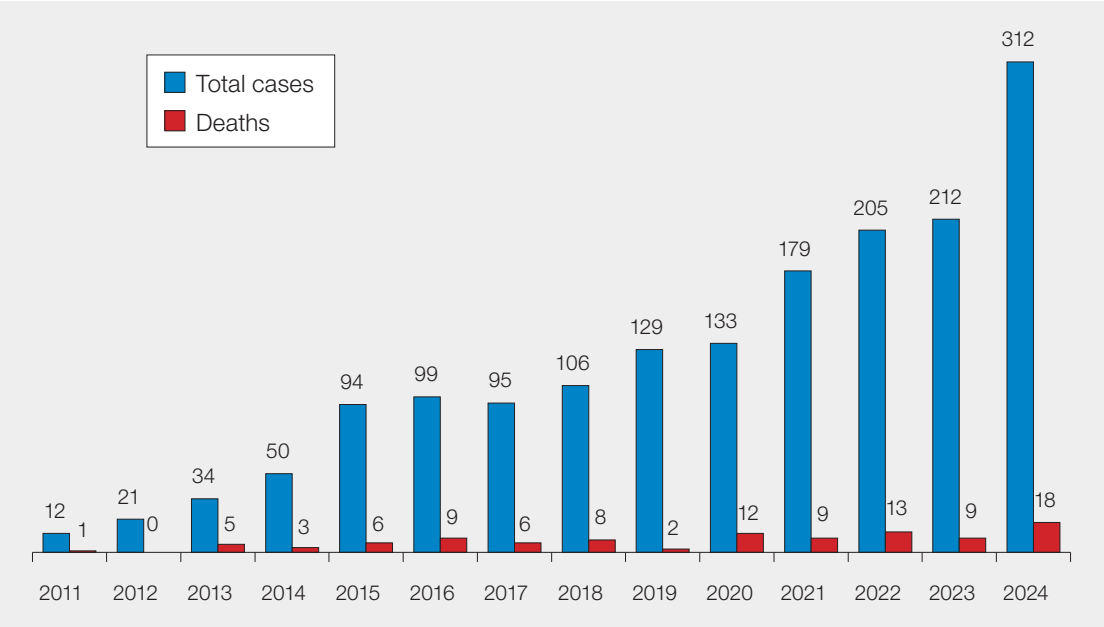
Definition:

Where a transfusion of a blood component was clinically indicated but was not undertaken or non-availability of blood components led to a significant delay (e.g., that caused patient harm, resulted in admission to ward, or return on another occasion for transfusion).

Introduction

Increasing reports of delays prompted the publication of a CAS patient safety alert, with actions for hospitals (SHOT, 2022). The number of delays in transfusion reported to SHOT has further increased (n=312) when compared to previous years (Figure 11.1). The substantial increase in reports and the increase in deaths associated with transfusion delays is alarming and concerning. Delays in transfusion are often not attributed to a single point of failure but are commonly a result of multiple issues that contribute to a delay in care. The key themes identified in previous Annual SHOT Reports such as ineffective communication, delay in the recognition of bleeding and lack of relevant staff knowledge continue to be factors in 2024.

Figure 11.1: Delayed transfusions by year 2011-2024



Deaths related to transfusion n=18

There were 18 deaths reported due to delays: 8 imputability 2 (probable) and 10 imputability 1 (possible). This is a steep increase from 9 deaths related to delays in 2023 and 13 in 2022. The majority (n=15) were associated with delays in urgent or emergency transfusions. Common themes were delays in decision-making and missing vital steps in the transfusion process due to lack of knowledge, training, and poor staffing levels. In 12 cases there were delays in transfusion in patients with acute bleeding.

There were 3 deaths due to laboratory-related errors associated with delays in making blood components available. Lack of knowledge of alternative options in emergency settings was a key theme in these events.

Case 11.1: Delay in provision of alternative blood component contributes to the death of a paediatric patient (imputability 2 – probable)

A neonatal consultant requested platelets for an unwell neonate who was waiting to be transferred to a specialist unit. The urgency of the transfusion was not clearly communicated by the clinical team initially. In addition, the transfusion biomedical scientist (BMS) was not aware of alternative options available.

This case is discussed further in Chapter 17, Laboratory Errors (Case 17.1) and Chapter 25, Paediatric Cases (Case 25.1).

Fifteen deaths were related to clinical errors resulting in avoidable delays, most of these were associated with patients who were actively bleeding (n=9). There were 11 errors at the request stage, 3 at sample taking and 1 at prescription. All incidents were multifaceted, most commonly associated with delay in recognising bleeding, communication failures, and lack of knowledge of local processes.

Case 11.2: Failure to recognise bleeding contributed to the death of a new mother (imputability 1 – possible)

A woman experienced a significant bleed following the birth of her baby. There was a delay in the clinical team recognising the severity of bleeding and escalating care appropriately. This was due to multiple factors including issues with equipment and focus on an alternative diagnosis. The MHP was not activated, delaying appropriate transfusion support. Coagulopathy was not promptly recognised and addressed; fibrinogen replacement was initiated too late to be effective. The patient suffered multiple cardiac arrests, and despite surgical intervention and intensive care, she died a few days after giving birth with disseminated intravascular coagulation.

Maternal deaths from haemorrhage are uncommon. A recent national report on maternity care (MBRRACE-UK, 2024) noted 6.5% deaths were due to maternal haemorrhage (18 of 275) in the period 2020 to 2022, a rate of 0.89 per 100,000 maternities.

Case 11.3: Multiple issues contributed to the delay in transfusion during major haemorrhage (imputability 2 – probable)

A patient with postoperative bleeding failed to receive a timely blood transfusion out-of-hours. There was a 3-hour delay in recognising the severity of bleeding and therefore the MHP was not activated. The initial group and screen (G&S) sample was rejected, and the urgency of the transfusion was not clearly communicated to laboratory staff. The clinical team on the ward were unfamiliar with the management of patients with major bleeding and were not aware of the procedures for accessing emergency blood components. The patient suffered a cardiac arrest and died.

Case 11.4: Assumption resulted in a 10-hour transfusion delay (imputability 2 – probable)

An elderly patient with a gastrointestinal (GI) bleed and a haemoglobin (Hb) of 45g/L was prescribed a unit of red cells. There was a misunderstanding regarding who should request the red cell units from the transfusion laboratory. The prescribing doctor assumed the nurses would request the blood as this was routine practice in the clinical area where they previously worked. Conversely, the nurses assumed the doctor would be requesting the blood as this was routine practice on the current ward. The error was noticed when the doctor reviewed the patient 10 hours later, the Hb had dropped to 38g/L. The patient was transfused one unit of red cells but suffered a cardiac arrest and died.

Major morbidity n=12

Major morbidity was reported in 3 cases associated with delays in the transfusion laboratory in making blood components available. Two of these delays were associated with an urgent need for blood components and occurred during MH.

Case 11.5: Multiple issues during major haemorrhage resulted in avoidable delays in accessing blood components

A patient with a suspected ruptured ectopic pregnancy presented to the emergency department (ED). O D-negative red cells were requested for immediate transfusion, but staff were unable to access units from the blood refrigerator despite multiple attempts. Similar issues occurred when trying to obtain red cells from the theatre and maternity refrigerators. The MHP was activated, but the incorrect obstetric alert was issued, delaying an appropriate response. The patient was transferred to theatre, where blood components were finally administered. The patient had lost 3L of blood and required intensive care unit (ICU) admission. A subsequent investigation revealed that an electronic blood management system upgrade had prevented units from being removed from the blood refrigerator.

Major morbidity was reported in 9 cases associated with delays due to clinical errors in the following processes, blood collection (n=2), sample taking (n=3), requesting components (n=3) and prescribing/

authorisation (n=1). Seven out of the 9 delays were associated with urgent cases in patients who were bleeding.

Case 11.6: Multiple issues and delayed decision-making contributed to a delay in blood component provision during a MH

A patient with significant bleeding required an urgent transfusion, but rejection of multiple samples delayed the provision of crossmatched red cell units. When emergency red cell units were requested, further delays occurred due to problems accessing the remote blood refrigerator. By the time emergency red cell units were obtained, the patient had lost approximately 1000mL of blood, suffered a cardiac arrest and was admitted to the ICU.

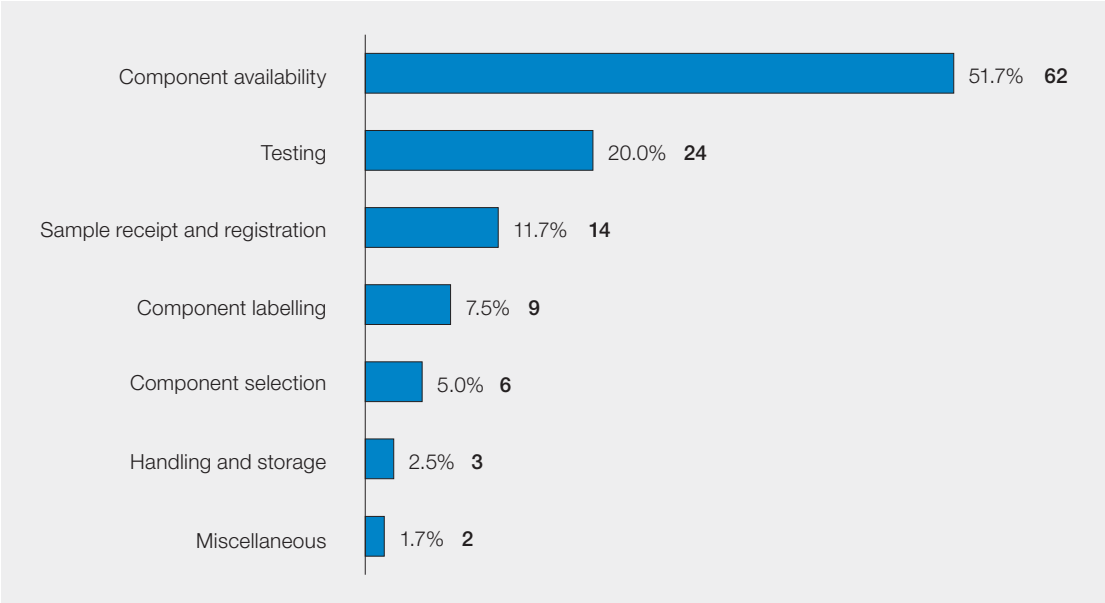
Case 11.7: Failure to contact the laboratory during MH resulted in blood component delays

A patient was found in the hospital grounds with a massive upper gastrointestinal bleed. The MHP was activated, but no blood components were sent from the laboratory. Upon investigation, the transfusion laboratory had not received the notification of the activation, leading to a significant delay in blood provision. Emergency O D-negative red cells units were administered from the ED, but the patient required further transfusion support and ICU admission. Multiple follow-up calls with communication gaps, compounded by confusing terminology contributed to the delay. In-person visits to the laboratory were necessary to clarify the request and obtain the required components.

Laboratory errors n=120

The number of laboratory errors that resulted in delays has more than doubled since the previous Annual SHOT Report (2024 n=120, 2023 n=56) with common themes. Failure in communication was the most common issue. Problems specifically occurred during handover in 26 cases. SHOT data have previously shown that incomplete handover is a contributory factor in many laboratory errors (Tuckley, et al., 2022). The availability of blood components was a key step in the transfusion process where errors occurred. Poor communication between clinicians, transfusion laboratories, and porters or couriers frequently led to delayed decision-making and blood availability.

Figure 11.2: Transfusion process step where laboratory errors occurred resulting in transfusion delays in 2024 (n=120)



Case 11.8: Delay in provision of blood components during a MH due to red cell antibodies

Provision of emergency blood components caused delays for a woman with a massive obstetric haemorrhage. A new red cell antibody was identified in the G&S sample. The clinical team was advised that they needed approval from the haematology specialist registrar before emergency

group O or group-specific red cell components could be issued. This led to a delay in blood provision for a bleeding patient.

Case 11.9: Patient put at risk due to staffing issues in the laboratory

A woman with suspected ectopic pregnancy presented to the ED out-of-hours. G&S samples were sent to the transfusion laboratory for urgent crossmatch. The transfusion laboratory was not staffed and a lone-working BMS in the biochemistry department received undue pressure to also cover the transfusion service. Clinical site managers at the hospital were not aware of the situation. The clinical team knew how to access emergency blood components, and the patient was transfused with full recovery.

A more detailed case study is provided in Chapter 17, Laboratory Errors (Case 17.3).

Case 11.10: Multiple issues resulted in a delay in blood for a patient with a GI bleed

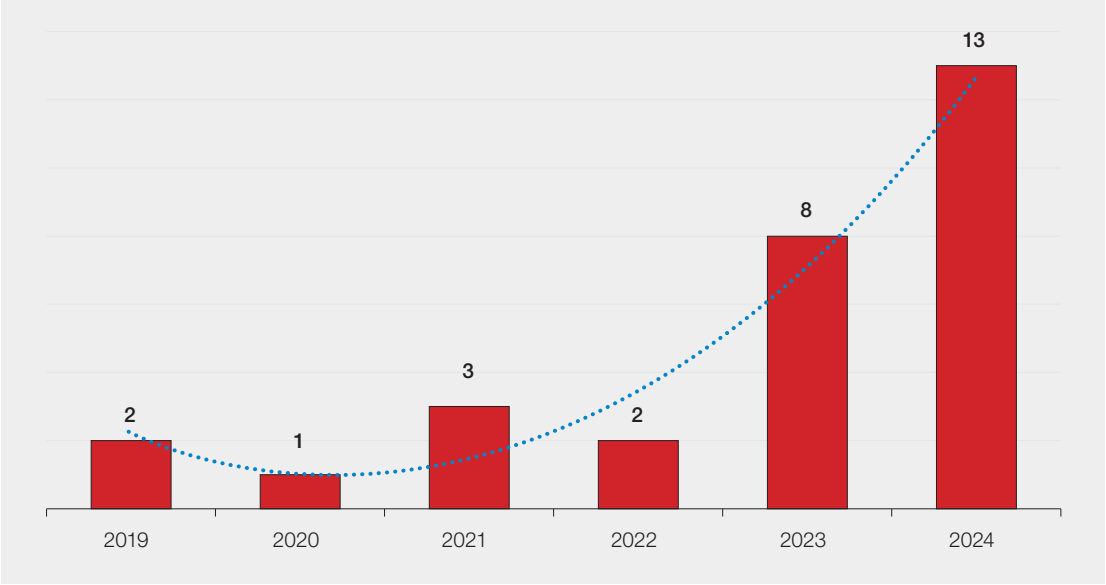
A patient with multiple co-morbidities and an upper GI bleed due to varices required blood components. The MHP was activated, and multiple clinical specialties were involved in his care. There was a delay in accessing blood components, the patient did not have a valid G&S and the laboratory requested a G&S sample. The porter was subsequently unable to access the blood refrigerator. The patient suffered cardiac arrest as the blood was being transfused and was transferred to ICU where he died, unrelated to the delay.

Blood Service errors n=13

There were 13 delayed transfusions due to errors in Blood Services (Figure 11.3). In many of these cases the delays were a combined result from errors in the hospital as well as in the Blood Services. In 3/13 cases the patients were paediatric, all requiring red cell units for neonatal exchange transfusion. Of the 13 cases, there were 3 patients affected by the national platelet shortage, 2 haematology patients and 1 major obstetric haemorrhage patient who was issued a B D-positive adult therapeutic unit of platelets (the patient's blood group was O D-positive). This was reserved for a different patient, but at that time, the transfusion laboratory did not hold any other unit in stock. One sickle cell disease patient with multiple red cell antibodies received a lower volume transfusion in two exchange transfusions than indicated during the national amber alert. This was due to unavailability of suitable red cell units.

Communication issues including miscommunication about urgency of the transfusion request, unclear timelines from the Blood Services and specialised blood components required were the most common contributory factors identified. In 1 case, the red cell units crossmatched by the reference laboratory were delivered to the wrong hospital. Even though there was no major clinical impact reported in these patients, they had to return on a different day for their appointment or be transfused later on the same day with potential risk for harm.

Figure 11.3: Trend in Blood Service-related errors 2019-2024



Delays associated with MH n=73

Delays associated with MH continue to rise year-on-year (Figure 11.4). Several recurring themes have emerged in this year's Annual SHOT Report, highlighting the systemic, procedural, and logistical issues contributing to delays in blood transfusion during MH cases. These high-pressure, time-sensitive scenarios reveal that each case is not simply a result of a single error but rather a multitude of factors resulting in delayed care. These common factors are highlighted in Figure 11.5.

Figure 11.4: Delays associated with MHP 2016-2024

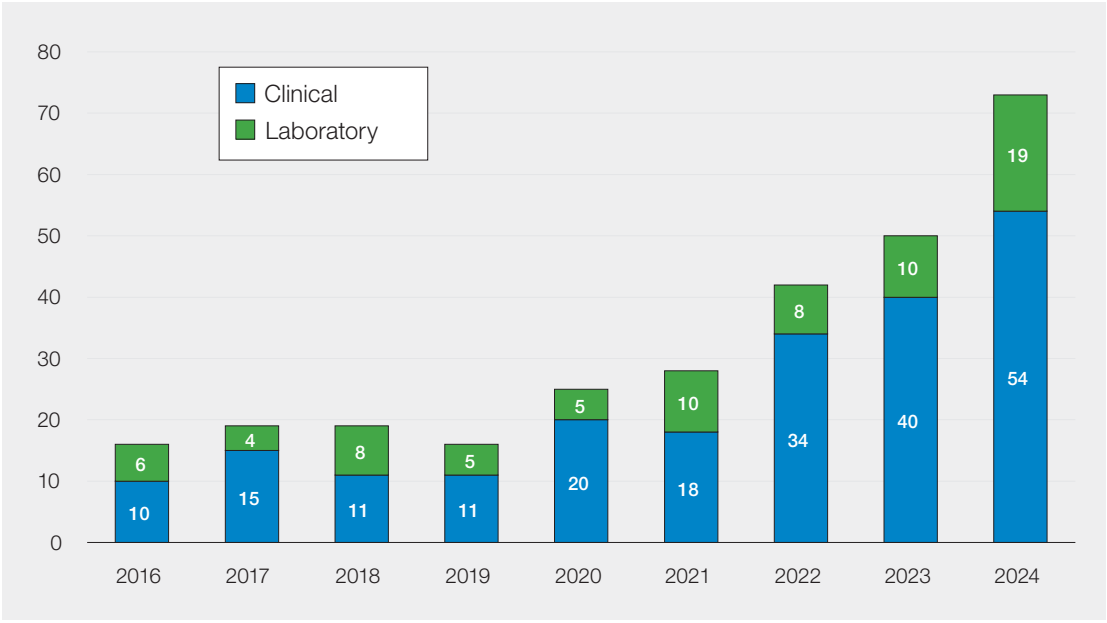
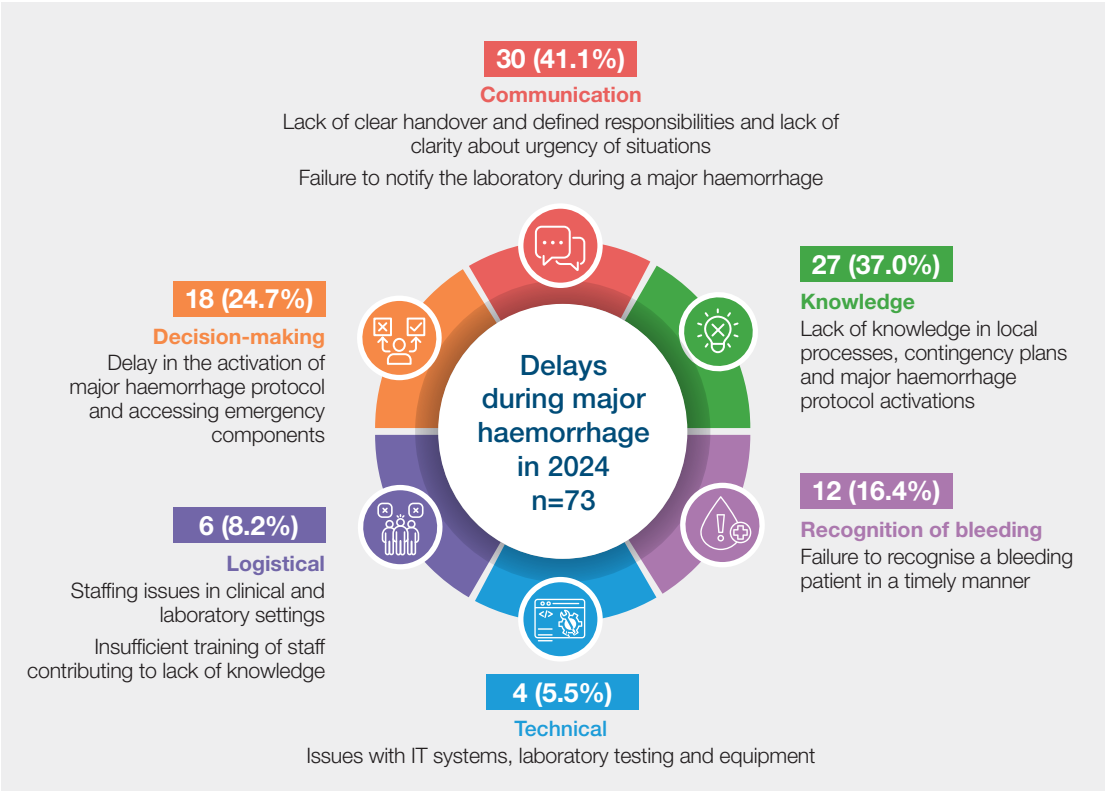


Figure 11.5: An image depicting the multiple contributing factors that resulted in delays during major haemorrhage in 2024 (n=73)



IT=information technology; MH=major haemorrhage; MHP=major haemorrhage protocol

Learning points

- Effective handover is essential especially when serious bleeding occurs out-of-hours
- All clinical and laboratory staff working in transfusion must have adequate knowledge and skills to ensure safety
- Prompt recognition of bleeding is crucial for timely and appropriate treatment
- Awareness of contingency plans is essential to ensure smooth processes when technical issues arise
- Clear protocols should be in place to support laboratory staff when issuing blood components in emergency situations, especially for patients with red cell antibodies

Conclusion

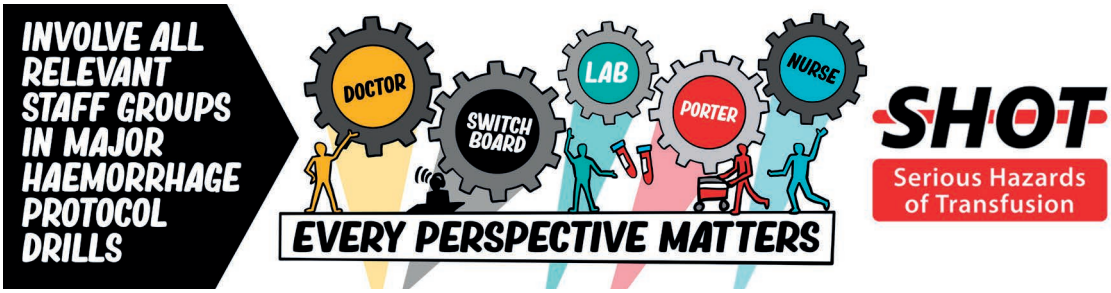
Patients should not die or suffer harm from transfusion delays. Poor communication, lack of clinical knowledge, and workforce issues continue to be key contributors. Urgent action is required to improve transfusion safety, particularly during MH and emergency situations.

Any delay initiating a necessary blood transfusion can cost lives. Timely transfusion support is not optional; it is a critical, life-saving intervention. All systems, processes and staff must prioritise immediate access to blood components to prevent avoidable harm or death. The steep increase in laboratory errors leading to delays is a cause of concern and calls for urgent action.

Ensuring laboratory safety is fundamental to patient care. Every incident is a signal, not just of risk but of opportunity to strengthen systems, eliminate hazards and build a culture where safety is everyone's responsibility. A safe laboratory is essential for trust, quality and care without harm.

Reliable and safe transfusion information technology (IT) is vital to ensure patient safety. System failures, delays or design flaws can directly compromise patient safety. Every effort must be made to ensure transfusion IT systems are robust, effective, and resilient.

The SHOT CAS alert provides clear recommendations to mitigate these risks (SHOT, 2022), but effective implementation is dependent on addressing staffing levels, training gaps, and improving communication pathways within transfusion laboratories and across clinical services.



Recommended resources

Avoidable, Delay and Under or Overtransfusion (ADU) Cumulative Data
https://www.shotuk.org/resources/avoidable-delay-and-under-or-overtransfusion-adu-cumulative-data/

SHOT Bite No. 8: Massive Haemorrhage Delays
https://www.shotuk.org/resources/shot-bite-no-8/

SHOT Video: Delayed Transfusion in Major Haemorrhage
https://www.shotuk.org/resources/delayed-transfusions-in-major-haemorrhage/

SHOT Webinar: Every Minute Counts
https://www.shotuk.org/resources/every-minute-counts-webinar-2021/

SHOT
Serious Hazards of Transfusion