

# 11a Delayed Transfusions n=205

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## 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).

## Key SHOT messages

- Delays accounted for the largest number of transfusion-related deaths across all SHOT reportable categories in 2022
- Poor communication at multiple points during the patient's care is common and exacerbates delays
- Patients should not die from anaemia or bleeding: irregular antibodies delay provision of compatible components and should be discussed with clinicians as soon as known
- Delayed recognition of bleeding increases morbidity and mortality. Low blood pressure should alert clinicians to consider haemorrhage
- MHP are either not activated when indicated or not followed correctly
- Staffing problems contribute to delayed transfusions

## Recommendations

- Hospitals should review their MHP and test them with drills to ensure they are fit for purpose. All steps should be tested by simulation from end-to-end involving the transfusion practitioner and transfusion laboratory manager
- All MHP activations should be followed by a debrief to identify what went well and what did not, and this should include transfusion laboratory staff
- The MHP alert should require a single call to a dedicated telephone line which is then cascaded to all relevant departments
- Hospitals should review their staffing capacity plans for transfusion laboratories. This is an essential service where understaffing can contribute to adverse patient outcomes
- Laboratories must ensure their transfusion staff are contactable at all times for emergencies
- Hospitals should review their use and training of agency staff in areas where blood transfusion may take place
- When there are delays due to antibodies, or difficulty obtaining second samples etc., and the need for transfusion is urgent, laboratory staff should offer a 'Plan B' indicating what can be given immediately (O D-negative or O D-positive red cells) with appropriate monitoring

**Action: Hospital transfusion committees**

## Introduction

Reports of delayed transfusions continue to increase (Figure 11a.1). Patients may die and this prompted publication of a CAS national alert, with actions for hospitals including review of their policies and procedures (SHOT 2022).

In 2022 many problems were related to inadequate staffing in both clinical and laboratory areas. The use of agency staff, inadequate skill mix, and poor transfusion training were contributory. ED were often reported as 'very busy' and the number of overall errors reported from the ED continues to increase (Figure 2.7 in Chapter 2: Participation in UK Haemovigilance).

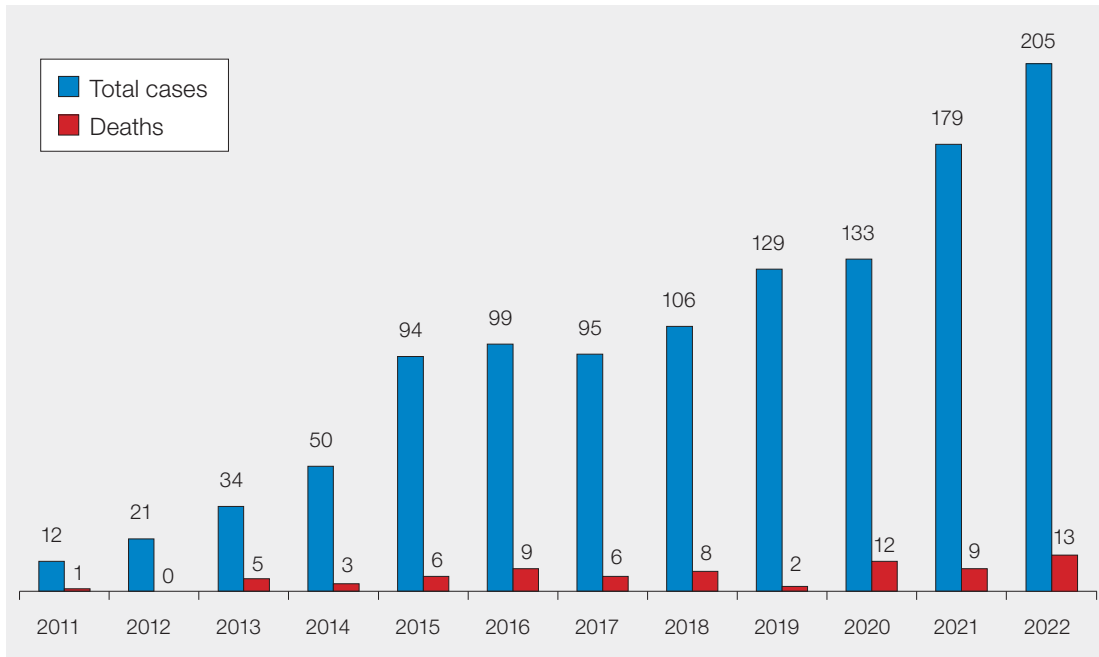


Figure 11a.1: Delayed transfusions by year 2011 to 2022

## Key factors in delays

There were 205 delayed transfusions reported in 2022. The primary causes of these delays are detailed in Figure 11a.2. The most common cause of delays were communication, logistical and technical issues, however many cases had multiple errors.

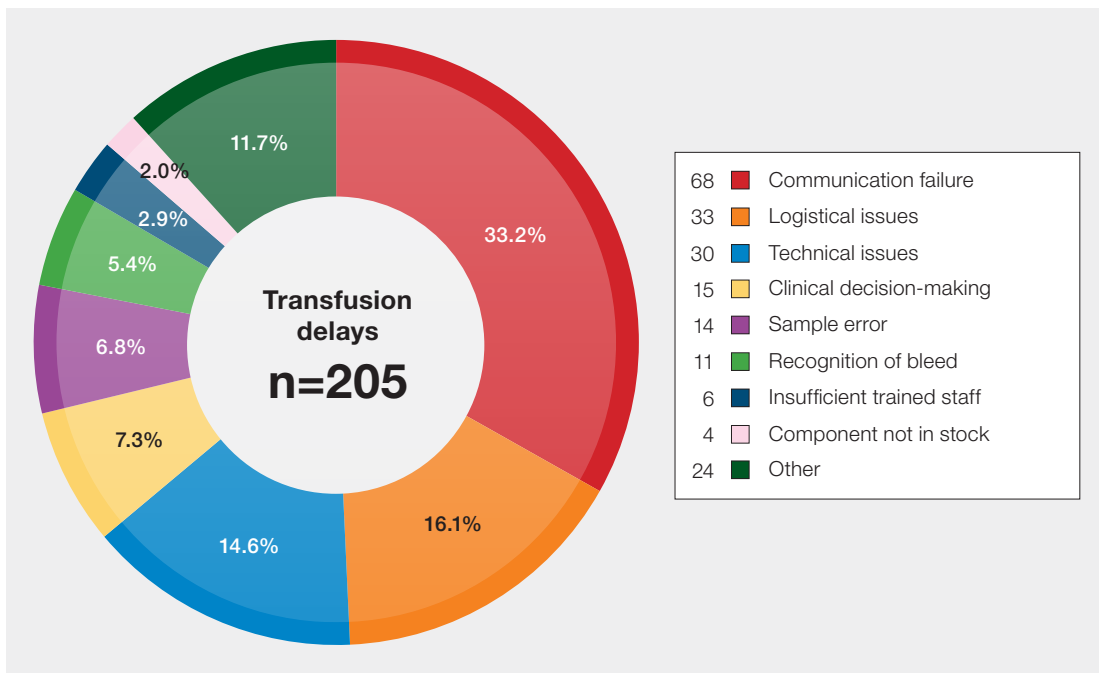


Figure 11a.2: Primary causes of delayed transfusions in 2022 (n=205)

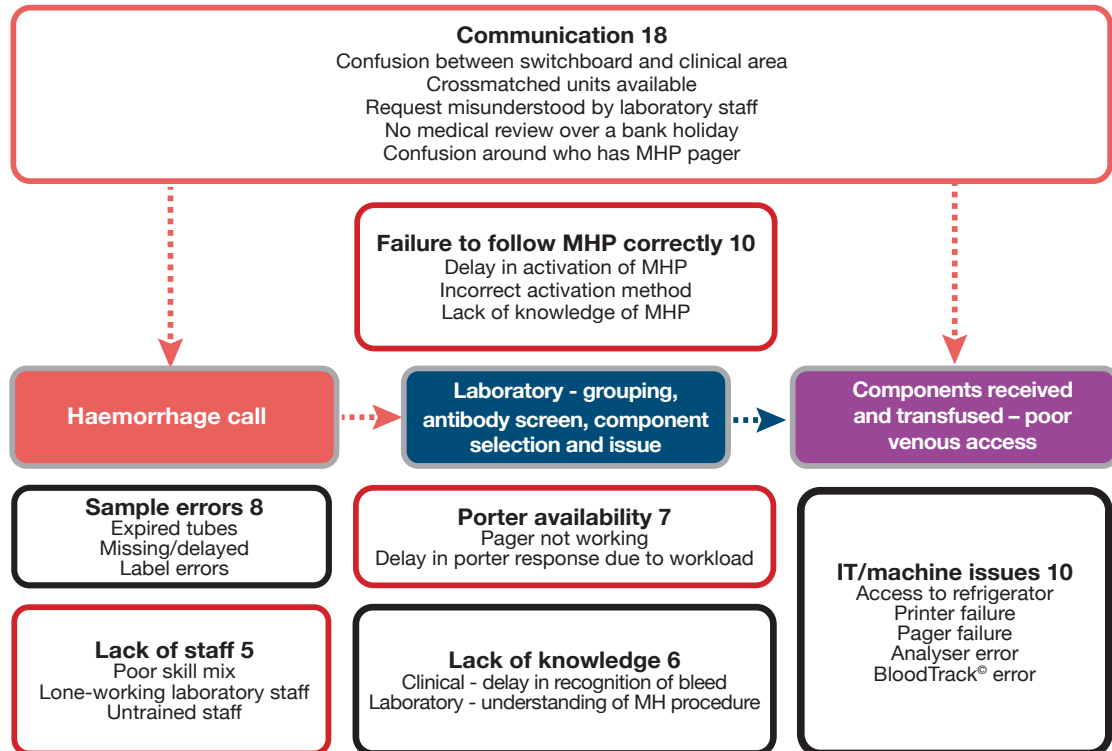
**Gastrointestinal bleeding** was reported in 27 cases; 5 deaths were related to the delayed transfusion. Recognition of bleeding and timely management is key to prevent delays in these patients.

**Irregular antibodies** often lead to delayed provision of red cells, noted in 24 cases of delay. Four patients died and of those 1 death was definitely related (imputability 3, see Case 11a.1), 1 death was probably related (imputability 2) and 2 were possibly related (imputability 1, see Case 11a.3).

Eleven cases resulted from delays in laboratory referral to a specialist laboratory.

**MHP-related errors** continue to cause delays. There were 41 reports of MHP activation including 6 obstetric cases and 14 cases of GI haemorrhage.

Figure 11a.3:  
Key factors  
contributing  
to delayed  
transfusions in 41  
cases of major  
haemorrhage



MHP=major haemorrhage protocol; IT=information technology

### HF contributing to delayed transfusion

- Communication problems were reported in 110 cases and were the most important contributory factor in 24 (21.8%)
- Failures in team function were cited as contributory in 62 (56.4%) cases
- Mismatch between workload and staff provision at the time of the incident was reported in 53 (48.2%)

In addition to answers in the HF section of the questionnaire, a review of cases demonstrated:

- Staff shortages were reported in 5 cases, and poor skill mix in 7 cases
- Busy units and departments were reported in 24 cases, 13 in ED or MAU and 4 in the laboratory
- Lone-working BMS in 6 cases
- Lack of transfusion-trained staff able to administer the transfusion in 12 cases
- Delayed escalation of an increasing EWS was noted in 3 cases

In 30 cases multiple factors were reported.

## Learning points

- Urgent transfusions should not be delayed by lack of staff. The need should be escalated to acquire competent staff, or the patient transferred to a location where transfusion can be safely administered
- A pragmatic approach is required to risk-assess and train locum/agency staff to perform transfusion activities to ensure safe delivery of transfusion services



## Deaths related to transfusion n=13

There were 13 deaths reported due to delays. This compares with 9 deaths related to delays in 2021 and 12 in 2020.

- 1 was definitely related (imputability 3)
- 3 were probably related (imputability 2)
- 9 were possibly related (imputability 1)

In 4 cases the patients had irregular antibodies contributing to the delayed transfusion and death.

### Case 11a.1: Delayed red cell transfusion and death in a patient with GI haemorrhage

*An elderly person (known anaemia due to CML) was seen in the ED at 18:20 with coffee-ground vomit. Blood samples ('routine') were received in the laboratory 3 hours later (21:24), Hb 58g/L. Red cell units were requested (not identified as urgent) but irregular antibodies were detected, delaying provision of compatible units until 23:00. The MHP was activated at 23:40 and due to communication failures, the patient received emergency group O D-negative units (possibly incompatible); the patient was hypovolaemic, arrested and died.*

Review noted that the ED was very busy. Transfusion and MHP training had been suspended due to COVID-19 pressures. Similar cessation of training was noted in another death due to delayed transfusion.

In 2 cases delayed provision of platelets contributed to death.

### Case 11a.2: Delayed platelet transfusion in a patient with severe thrombocytopenia due to AML

*An elderly man with AML had a Hb of 65g/L and platelets  $2 \times 10^9/L$  at an outpatient visit. He was contacted to return for transfusion. Platelets were ready at 15:30. He attended the ED at 17:00, and fell at 19:30 sustaining a head injury. He was transfused platelets at about 22:30. He died of a subdural haematoma with brain herniation as a result of traumatic head injury following the fall. The 5-hour delay in platelet transfusion was considered contributory.*

The ED was very busy and there were gaps in communication. The local review concluded that the haematology day unit was a more appropriate location for patients to wait for review of their blood counts to avoid such delays.

The second case is included in the supplementary information on the SHOT website (<https://www.shotuk.org/shot-reports/report-summary-and-supplement-2022/>).



### Learning points

- Failure to communicate the urgency of requests leads to delays in blood component provision. Ensure that the request for samples and blood components is clear and that the urgency is stated
- Transfusion laboratory managers could consider education of clinical staff with a traffic light system detailing the meaning and time to red cell availability for 'emergency', 'urgent' and 'routine' requests
- Access to emergency components (red cells and platelets) should be clearly communicated to staff and form part of their MHP training

#### Case 11a.3: Delayed transfusion and death - sample errors and failure to recognise GI bleeding

*A woman in her 60s, recently in hospital with myocardial infarction, was readmitted 3 weeks later at 04:10 with recurrent chest pain, vomiting and acute anaemia. Her Hb had fallen from 113g/L to 68g/L over 3 weeks. She was thought to have further myocardial infarction secondary to anaemia.*

*The first sample at 04:30 was rejected; transposed first and last names. The same error was repeated with a second sample at 08:26. The BMS made several unsuccessful attempts to contact the ED, unanswered telephone calls. Eventually new samples were received at 11:39; two red cell units were available at 13:36. However, the MHP was activated at 13:04 (Hb 34g/L) and four units of emergency O D-negative red cells were used. Despite this she died. Her anticoagulants had not been reversed and the GI bleeding was not identified until the very low Hb was recorded. A serious incident investigation was undertaken to establish what caused the delay in identification of GI bleeding; noted that the patient's first language was not English, and this may have been a contributory factor.*

Another death in an elderly man with major GI bleeding occurred as a direct consequence of delayed transfusion. The pre-transfusion Hb was 38g/L, there was poor communication, confusion and a failure to escalate by the junior doctor.



### Learning points

- Recognition of bleeding is crucial for timely and appropriate treatment
- GI bleeding is associated with a high risk of death in elderly patients. Low blood pressure is an important sign. Bleeding should be excluded before assuming the low BP is caused by something else
- Good handover information is essential especially when serious bleeding occurs out-of-hours
- It is essential to correctly identify patients and their samples; this can be a particular problem where the patient's first language is not English, and where there is also an alternative alphabet (such as Arabic) so that the spelling used in English may not be consistent on different occasions

#### Case 11a.4: Delayed transfusion due to haemolysis contributes to death

*An elderly woman was admitted to the ED at 20:06 following collapse at home (chemotherapy 10 days earlier). Hypotension improved with IV fluids. Venous blood gas Hb was 54g/L. Blood tests were uninterpretable due to haemolysis (including blood group, antibody screen and crossmatch). The haematology consultant advised immediate transfusion of emergency group O red cells with steroid cover. At 03:13 prednisolone was given but no red cells. She suffered cardiac arrest at 05:10 with successful resuscitation but resuscitation was not attempted after another cardiac arrest. Death was considered 'possibly related' to this delay.*

A further case is included in the supplementary information on the SHOT website (<https://www.shotuk.org/shot-reports/report-summary-and-supplement-2022/>). In total there were 24 cases of delays related to irregular antibodies in the patient.

## Learning points

- When patients have irregular antibodies and require urgent transfusion clinicians should liaise with the transfusion laboratory staff and haematologist
- A 'Plan B' should be in place, i.e., use group O D-negative or positive (with close monitoring and steroids) rather than risk patient death from severe anaemia. Transfusion laboratories should have an SOP for concessionary release



Additional case reports of deaths possibly related (imputability 1) to transfusion can be found in the supplementary information on the SHOT website (<https://www.shotuk.org/shot-reports/report-summary-and-supplement-2022/>).

## Major morbidity n=6

Of these, 2 cases involved young adults with SCD who deteriorated as a result of delayed transfusion.

A further case involved a patient with irregular antibodies which is discussed in the supplementary chapter; a child with a brain tumour whose platelet transfusion was delayed and developed ICH; delayed recognition and management of haemorrhage which resulted in a cardiac arrest call (the patient recovered with transfusion and surgery) and in the other case postoperative bleeding was associated with poor communication and multiple errors in the MHP.

### Case 11a.5: Delayed transfusion in a patient with SCD associated with clinical deterioration

*A patient with SCD, and a Hb of 64g/L, had two units of red cells authorised to be given as soon as available, but was not transfused until the following day. Nursing staff were unclear when the blood was meant to be given despite verbal handover the day before. The patient deteriorated with worsening chest pain and new oxygen requirement and subsequently required exchange transfusion.*

Timely transfusion would likely have prevented deterioration.

The second case with SCD was similar, a delay of more than 12 hours receiving transfusion when he presented with acute chest syndrome. The patient needed exchange transfusion.

## Learning points

- People with SCD benefit from specialist referral at an early stage of admission
- Junior medical staff should not hesitate to escalate for advice and discuss transfusion requirements with the transfusion laboratory



### Case 11a.6: Delayed transfusion due to communication failures and lack of clarity in the MHP

*A woman experienced unexpected major bleeding the day after routine cholecystectomy (accidental damage to the portal vein) resulting in MHP activation. She was haemodynamically unstable with a pre-transfusion Hb of 36g/L. There was a 15-minute delay in the issue of red cells because the BMS was unclear about the patient location (transferred from ICU to theatre) and whether formal patient ID was needed. She received 15 units of red cells, six of plasma, one of platelets and fibrinogen.*

There were several communication failures during the MHP. There was a lack of clarity and unfamiliarity with the MHP, and miscommunication across all three departments involved in the care of this patient.

In total poor communication was identified as contributory in 110 cases of delayed transfusions.

## i

**Learning points**

- Poor communication frequently contributes to delayed transfusions. Be clear and concise
- MHP need drills covering each step of the process, including how to step down. Drills should also include obtaining blood packs

**7C's of safe and effective communication****Delays associated with the laboratory n=62**

In 21/62 reports issues were noted with laboratory staff skills or knowledge and 9 cases reported a mismatch between workload and staff provision at the time of the incident. There were 15/62 delays that involved IT (16 clinical delays also involved IT). In 10 cases, delays were related to the presence of irregular antibodies or autoimmune haemolysis leading to delays in testing. Three of these were at the Blood Centre.

## i

**Learning points**

- Laboratory staff working in transfusion must be adequately trained and competency-assessed
- Lone working out-of-hours is a risk factor for delayed transfusion
- Changes to routine practice, such as bank holiday working hours, should be clearly communicated to all staff

Information about responses related to HF questions can be accessed in the supplementary information on the SHOT website (<https://www.shotuk.org/shot-reports/report-summary-and-supplement-2022/>).

**Near miss n=6**

These included issues with storage in emergency and satellite refrigerators, and problems in the laboratory with sample validity (3 cases).

In 1 case staff in the ED made emergency units unavailable for 12 hours by trying to place a unit of patient-specific red cells in the refrigerator (this is not allowed). In another case the laboratory had failed to include details about irregular antibodies on serial reports in pregnancy so that when a MH was called at delivery the red cell units were incompatible but fortunately were not required. This was identified as an issue with the LIMS which made it difficult to add these results.

**Conclusion**

Delayed transfusion puts patients at risk and can contribute to death. Poor communication exacerbated transfusion delay in more than half the reported cases. Staffing shortages are a widespread problem in NHS hospitals and have been identified in many cases of delayed transfusion. Staff should escalate these issues to their managers and review their capacity plans. The recommended actions as per the SHOT CAS alert will help address preventable transfusion delays and improve patient safety. Patients should not die or suffer harm from avoidable delays in transfusion.

## Recommended resources

### SHOT Bite No. 8: Massive Haemorrhage Delays

<https://www.shotuk.org/resources/current-resources/shot-bites/>

### SHOT Video: Delayed Transfusion in Major Haemorrhage

<https://www.shotuk.org/resources/current-resources/videos/>

### SHOT Webinar: Every Minute Counts

<https://www.shotuk.org/resources/current-resources/webinars/>

**2018 National Comparative Audit of Major Haemorrhage** <https://hospital.blood.co.uk/audits/national-comparative-audit/reports-grouped-by-year/2018-audit-of-the-management-of-major-haemorrhage/>

**Can you PACE yourself? The power of language to flatten hierarchy and empower multi-disciplinary healthcare teams in simulated critical scenarios**

<https://www.gloshospitals.nhs.uk/work-for-us/training-staff/gsqja/quality-improvements/Can-you-PACE-yourself/>

**15s30m stands for 15 seconds, 30 minutes – taking a few extra seconds at the start of a process can save someone a lot of time further along, reducing frustration and increasing joy at work.**

<https://fabnhsstuff.net/fab-stuff/15-seconds-30-minutes>



## References

SHOT. Preventing transfusion delays in bleeding and critically anaemic patients SHOT/2022/001 (2022) <https://www.cas.mhra.gov.uk/ViewandAcknowledgment/ViewAlert.aspx?AlertID=103190> [accessed 28 April 2023].

