11b Avoidable Transfusions n=121

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Definition:

Where the intended transfusion is carried out, and the blood component itself is suitable for transfusion and compatible with the patient, but where the decision leading to the transfusion is flawed. Every unit transfused should be an individual decision, so this might include transfusion of multiple units where not all were appropriate/necessary.

Reporting should include:

- **Components that are not required or are inappropriate because of erroneous laboratory results, transcription errors, miscommunication or faulty clinical judgement**
- **Components that are for an inappropriate indication**
- **Transfusion of an asymptomatic patient with haematinic deficiency**
- **Avoidable use of emergency group O blood (D-negative or D-positive) where group-specific or crossmatched blood was readily available for the patient or the laboratory could have supplied a more suitable component, including use of group O when time would allow a more appropriate group to be remotely allocated from a remote release refrigerator system**

Key SHOT messages

- Group O D-negative units, a precious resource, continue to be used inappropriately
- Poor communication and flawed decision-making contribute to avoidable transfusions, including use of O D-negative units when crossmatched or group specific units were available
- Haematinic deficiencies are poorly recognised and managed inappropriately. Transfusion in patients with haematinic deficiency carries increased risk of TACO
- Transfusion decisions based on inaccurate blood results continue to be reported

Recommendations

- Unless the transfusion is an emergency, the pre-administration bedside checklist should include a review of the patient's Hb or platelet count and confirmation with the patient that they have given consent
- Centres using electronic authorising should consider pulling through laboratory results to the request form, to alert the prescriber to any discrepancies
- Blood authorisation charts should be designed to capture the indication for transfusion and any specific instructions, such as the circumstances under which transfusion should be given
- By authorising a blood component, the prescriber affirms they are requesting the correct component for the correct patient and have confirmed this is clinically necessary. Systems should be designed to make as many opportunities as possible to check that this is the case

Action: Hospital transfusion teams, UK medical schools, transfusion laboratory managers, clinical haematology teams

Introduction

There were 121 reports of avoidable transfusion compared to 116 in 2021 and 110 in 2020.

Deaths related to transfusion n=0

There were no deaths related to avoidable transfusions.

Major morbidity n=0

There were no cases of major morbidity related to avoidable transfusions.

Group	Red cells	Platelets	Plasma components	Multiple components	Total reports
Flawed decision	16	4	2	0	**22**
Decision based on inaccurate results	32	8	1	2	**43**
Failure to respond to change in circumstances	11	4	0	1	**16**
Transfusion without decision	5	1	0	1	**7**
Appropriate decision, inappropriate component	33	0	0	0	**33**
Total	**101**	**17**	**3**	**4**	**121**

Table 11b.1: Classification of avoidable transfusions

This year, the incidents reported have been mapped to the stage of the transfusion process and the staff members likely to be involved in the errors (Figure 11b.1).

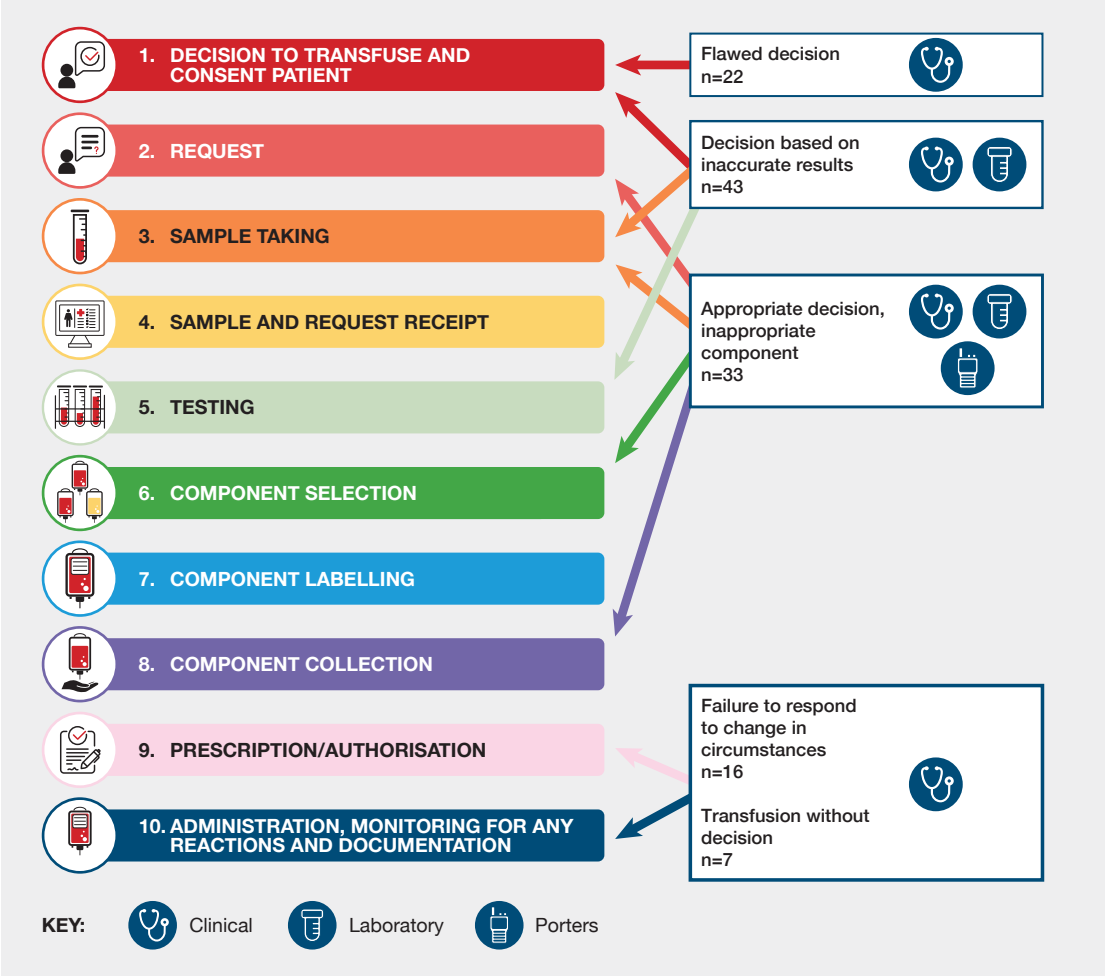


Figure 11b.1: Step in transfusion process with associated errors

Flawed decision n=22

Cases of flawed decision included: excessive transfusion for haematinic deficiency (n=6), transfusion of multiple units without review (n=7), transfusion above recommended thresholds (n=2), transfusion of platelets/plasma components to 'treat a number' in the absence of bleeding (n=3), misidentification of major haemorrhage (n=1), transfusion of a patient who had withheld their consent (n=3), all Jehovah's Witnesses.

Case 11b.1: Excessive transfusion for iron deficiency

A woman with menorrhagia, a Hb of 69g/L and moderate symptoms of anaemia received four units of red cells authorised by a junior doctor. One was warranted, but she should have been reviewed and Hb checked after each unit (or at the very least after two units). Her Hb was not measured until after the third unit and the result (Hb 105g/L) was not checked until after the fourth unit had been given. Her ferritin of 8micrograms/L was not acted on. There was a lack of understanding about the appropriate treatment of anaemia without transfusion. An anaemia clinic had been suggested but there was no funding.

Learning points

- Anaemia due to haematinic (vitamin) deficiencies is treated by replacing the missing vitamin. Transfusion should only be given where there is risk of haemodynamic instability, which is very unlikely in a young fit patient. If transfusion is essential, a single unit should be given followed by clinical review
- Clinicians authorising blood components for patients who cannot consent for themselves should check for any cautions or contraindications, just as they would check for allergies when prescribing a drug

Decision based on inaccurate results n=43

Cases where decisions were based on inaccurate results included: acting on old results (n=7), WBIT for FBC sample (n=4), use of another patient's results (n=2), misreading results (n=2), sample from drip arm (n=5), verbal handover of incorrect results (n=5), inaccurate results from a point-of-care device (n=4), spurious thrombocytopenia due to platelet clumping (n=3), other anomalous FBC results (n=11).

In 15 cases, these errors might have been prevented had there been a second check of the patient's laboratory parameters before proceeding with transfusion.

Case 11b.2: Results transcription error leads to unnecessary transfusion

An oncology patient received a transfusion of three units of red cells in a community hospital after a transcription error on the blood results recording page led to the platelet count of '80' being misread as the Hb. At the outpatient follow up appointment after transfusion, the Hb was over 200g/L.

Even if the Hb had been 80g/L, it is unlikely that three units would have been required.

Learning point

- There are multiple opportunities for an additional check of results prior to transfusion: at the time of the decision to transfuse, authorisation, release of units from the laboratory or immediately before administration. Systems making use of these checkpoints may be more likely to pick up erroneous decisions based on old or spurious results

Failure to respond to change in circumstances n=16

Cases where there was a failure to respond to change in circumstances included: components authorised for 'just in case' but transfused routinely (n=4), platelets given prophylactically for a procedure which

was cancelled (n=1), authorisation done in advance and recent results not checked (n=5), change in plan not communicated (n=3), transfusion already given but not documented (n=3).

Case 11b.3: Recent results not reviewed before commencing a transfusion prescribed in advance

A patient in their 80s with pure red cell aplasia was referred to the day ward for regular transfusion, two units of red cells every 2 weeks. She had recently been started on steroids. FBC was taken on arrival to the ward but transfusion of the first unit of red cells was started before the Hb result came back. The Hb was 140g/L and transfusion was stopped. Her Hb check 1 day before was also normal.

Learning points

- Where components are authorised 'just in case', e.g., for surgery, the authorisation should be accompanied by notes to explain under what circumstances these should be given
- Where authorisations are written in advance for patients attending for elective outpatient transfusions, there should be a routine step to check latest results and any change in patient circumstances before proceeding

Transfusion without decision n=7

Cases where patients were transfused without a formal written authorisation included: verbal handover of the plan to transfuse (n=3), transfusion prescribed for wrong patient (n=3), additional units given without prescription (n=1).

Case 11b.4: Miscommunication at verbal handover leads to a patient receiving an unnecessary red cell transfusion with an invalid prescription

A female (Patient 1) in her 50s was admitted to a haematology ward with AML and GvHD. Her Hb result on admission was 120g/L. She was due to receive ECP the following day, and there was a unit of red cells on standby in case they were required for this procedure. During a verbal handover Nurse 1 asked Nurse 2 to carry out two separate tasks; to obtain blood samples from Patient 1, and administer a red cell transfusion to Patient 2. Nurse 2 thought that they had been asked to transfuse Patient 1 and as there was a unit of blood in the refrigerator for Patient 1 (on standby for ECP), they collected this.

Pre-administration checks, including positive patient identification, checking the details of the patient with the ID band and prescription chart, and the final check of the compatibility tag with the ID band were carried out by two nurses. They did not notice the blood transfusion prescription dated 2 days previous to this and had not reviewed the patient's Hb result at any point. The red cells were administered. The patient suffered no ill effects from this avoidable transfusion.

This incident occurred on a very busy haematology ward which was full to capacity at the time. Nurse 2 thought they had understood what Nurse 1 had said when they took over the care of the two patients. They felt under pressure when asked to complete the requested tasks, as they were already caring for several other patients. The two nurses involved in the administration were already tired from previous long, busy shifts and there was a lack of staff at this particular time due to lunch breaks.

Learning points

- An authoriser should not authorise a blood component based on a verbal request without checking the indication and patient's results themselves
- Those administering transfusions should not rely on verbal handover but check there is a documented plan and completed authorisation before proceeding

Appropriate decision, inappropriate component n=33

Cases where an appropriate decision to transfuse was made but an inappropriate component was administered included avoidable transfusion of group O D-negative (n=28) and O D-positive (n=5) red cell units to patients with bleeding.

Thirty were due to clinical errors and 3 to laboratory error. Poor communication issues between the laboratory and clinical areas were implicated in 13 cases, while communication between different staff within the clinical area played a role in 7 cases.

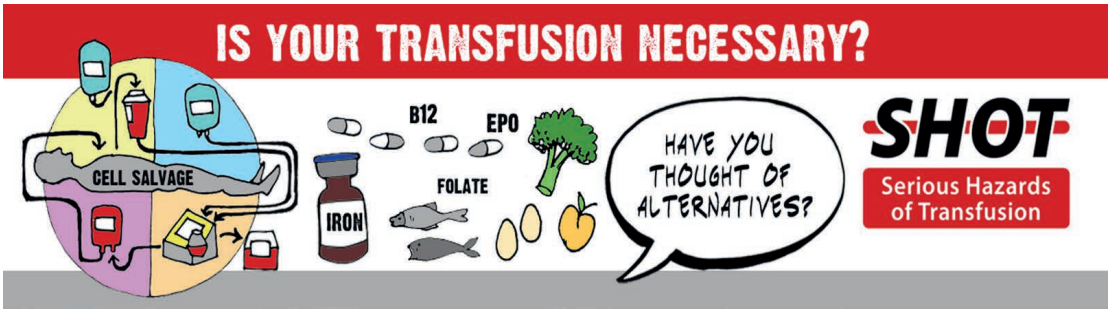
Crossmatched or group-specific units were available for 19 patients. In 7 cases, delays in taking a group and screen sample or mislabelled samples meant emergency units had to be selected. In 6 cases, a sample had been sent but the laboratory was not informed that the red cell units were required urgently. Three reports related to problems accessing group-specific units in remote refrigerators, 2 due to lack of trained staff and 1 due to an IT malfunction.

Case 11b.5: Multiple mislabelled samples result in prolonged use of group O D-negative units

A woman in her 20s was admitted to the ED following major trauma and issued an emergency trauma identity. The sample and request form did not match on the first set of two crossmatch blood samples received - Unknown Unknown on the sample, but a patient's name on request form. The second set of two samples both had unknown spelt incorrectly - Uknown on the sample. A third set of two blood samples was received 2 hours later. One did not have a DOB and was rejected. Group-specific blood components could only be made available after the seventh sample was received, resulting in prolonged use of emergency O D-negative blood.

Learning points

- Rules on correct sample labelling still apply in a major haemorrhage setting, including spelling of trauma ID names
- Taking samples promptly, delivering them to the laboratory and communicating their urgency are all central to provision of appropriate group-specific units



Near miss cases n=6

All of these were due to clinical errors, and 4/6 were discovered at the pre-administration checks.

The MHP was activated for an elderly woman with a GI bleed whose blood gas Hb was 43g/L but a repeat was 127g/L, so the MHP was cancelled (with wastage of a unit of O D-negative blood). The prescription was cancelled for two patients and detected at the pre-administration checks. A man in his 90s queried the need for a second unit which was then not given.

Conclusion

In a year where there have been shortages of blood components, particularly group O red cells, it is more important than ever that any transfusion given is clinically indicated and that group-specific components are given where possible. Including patients (where possible) in the decision to transfuse

is an important additional safety barrier, as a patient's questions might prompt greater scrutiny of the rationale for transfusion.

The largest number of reports related to patients receiving inappropriate transfusions based on incorrect laboratory results. These might have been prevented by an additional check of blood results prior to transfusion, which could be done at the stage of decision-making (e.g., a sense-check with a colleague, particularly if results are unexpected), authorisation (e.g., making use of IT systems to integrate laboratory results), issue from the laboratory (if BMS are empowered to question decisions) or administration (making review of results part of the pre-transfusion check).

Appropriate laboratory tests should be performed in patients with suspected iron deficiency to help direct onward investigation and management based on national gastrointestinal and gynaecology guidelines and local pathways within individual healthcare settings (BSH Fletcher et al. 2022). The 2019 national comparative re-audit of the medical use of red cells showed significant numbers of asymptomatic or only mildly symptomatic patients being transfused when their Hb levels are above the recommended thresholds. In this audit, one in five patients were transfused because of iron-deficiency anaemia and nearly 5% of transfusions were documented as given because of B12 or folate deficiency or both (NCA 2019). The 2021 national comparative audit of NICE Quality Standard QS138 helped identify areas where there were gaps in implementing patient blood management measures and recommended that hospitals explore barriers to the implementation of the NICE Quality Statements for Blood Transfusion (NCA 2021) (NICE 2016).

Clear lines of communication are central to an effective MHP, but this generally focuses on clinicians being able to rapidly contact the laboratory. To facilitate an effective switch to group-specific red cells, a defined communication channel from laboratory to clinical staff managing the haemorrhage is equally important. Local policies and processes must be in place and aligned with national guidelines for appropriate haematological management of major haemorrhage (BSH Stanworth et al. 2022).

SHOT
Serious Hazards of Transfusion

Recommended resources

E-learning modules:

Anaemia
Includes modules 'Anaemia - the only introduction you need', 'Anaemia in primary care patients', 'Anaemia in hospital patients' and 'Anaemia of inflammation and chronic disease'. Accessible via: https://hospital.blood.co.uk/training/clinical-courses/

Blood component use in major haemorrhage
https://www.e-lfh.org.uk/programmes/blood-component-use-in-major-haemorrhage/

The NHSBT O D-negative toolkit
https://hospital.blood.co.uk/patient-services/patient-blood-management/o-d-negative-red-cell-toolkit/

The A-E Decision Tree to facilitate decision making in transfusion
https://www.shotuk.org/resources/current-resources/

JPAC – Guidance for UK health professionals on consent for blood transfusion
https://www.transfusionguidelines.org/transfusion-practice/consent-for-blood-transfusion/guidance-for-healthcare-practitioners-involved-in-this-role

References

BSH Fletcher A, Forbes A, Svenson N, et al. Guideline for the laboratory diagnosis of iron deficiency in adults (excluding pregnancy) and children. *Br J Haematol.* 2022;**196(3)**:523-529. https://doi.org/10.1111/bjh.17900 [accessed 28 April 2023].

BSH Stanworth S, Dowling K, Curry K, et al. Haematological management of major haemorrhage: a British Society for Haematology Guideline. *British Journal of Haematology* 2022; **198(4)**:654-667 https://doi.org/10.1111/bjh.18275 [accessed 12 June 2023].

National Comparative Audit of Blood Transfusion. 2019 reaudit of the medical use of blood. Available at: https://hospital.blood.co.uk/audits/national-comparative-audit/reports-grouped-by-year/2019-re-audit-of-the-medical-use-of-red-blood-cells/ [accessed 12 June 2023].

National Comparative Audit of Blood Transfusion. 2021 National Comparative Audit of NICE Quality Standard QS138. Available at: https://hospital.blood.co.uk/audits/national-comparative-audit/reports-grouped-by-year/2021-national-comparative-audit-of-nice-quality-standard-qs138/ [accessed 12 June 2023].

National Institute for Health and Care Excellence Quality Standard (QS138) for Blood Transfusion published December 2016 https://www.nice.org.uk/guidance/qs138 [accessed 01 May 2023].