

# Under or Overtransfusion n=18

# 11c

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## Definition:

A dose inappropriate for the patient's needs, excluding those cases which result in TACO and usually resulting in a haemoglobin or platelet level significantly outside the intended target range. Infusion pump errors leading to under or overtransfusion with clinical consequences (if no clinical consequences, then it is reportable as HSE)

## Key SHOT messages

- More than 50% (10/18) cases in this category in paediatric patients. Volume calculation for transfusions in paediatric patients continues to be a concern
- Instances of overtransfusion continue to be reported where staff failed to check Hb increment following transfusions. This would help guide further transfusions



## Recommendations

- Paediatric transfusion protocols should be readily available for reference by all clinical staff
- Staff who authorise paediatric transfusion should be trained so that they know how to calculate the correct dose of all components
- Major haemorrhage drills should include taking samples for intermittent Hb checks, using a blood gas analyser if appropriate (and quality-assured for that purpose)
- Mandatory transfusion training should include information about special patient groups where standard guidelines may not apply, such as haemoglobinopathy patients
- Specialist haematology advice should be sought for management of patients with haemoglobin disorders

**Action: Hospital transfusion teams**



## Introduction

This year, recognising that there has been some confusion between cases of 'avoidable' transfusion and 'overtransfusion', the definition has been revised. Some cases reported in 2022 have been reclassified as avoidable, e.g., where a second unit was transfused that was not necessary. This has resulted in a smaller number classified this year as overtransfusion. As a result, 14 cases were recategorised from overtransfusion to avoidable transfusion.

There were 10 cases reported in children and these are discussed further in Chapter 23, Paediatric Cases. Errors in prescribing and administering blood components in children are common and hospitals should review their paediatric transfusion policy which must be aligned with national guidelines (BSH New et al. 2016).

## Deaths related to transfusion n=0

There were no deaths reported related to under or overtransfusion.

## Major morbidity n=2

### Case 11c.1: Overtransfusion during major haemorrhage

*An elderly woman had an estimated GI blood loss of about 500mL and was peri-arrest. A major haemorrhage call was made; she received six units of red cells and two of FFP. Her Hb post transfusion was 179g/L. There was no pre-transfusion Hb, and it was not assessed during the treatment.*

### Case 11c.2: Undertransfusion caused by a bleed back into red cell bag associated with peri-arrest in a man with GI bleeding

*A man in his 60s was admitted with haematemesis and melaena and a Hb of 54g/L. The first unit of red cells was transfused but the bag was disconnected from the pump and put on the bed while he had an urgent CT scan at night and then needed to use the urine bottle. While the nurse was fetching the second unit, about 500mL bled back into the first bag; the patient complained of chest pain and a feeling of doom. An arrest call was put out; he received further transfusion and recovered.*

A clamp on the line could have prevented the bleed back into the bag. The ward had a very poor skill mix. There were only two qualified nurses on duty overnight with a full ward and four patients who were actively bleeding. The nurse was exhausted and had to take time off work. She was a very experienced nurse but following a period of sick leave and counselling, she has resigned from her post.

## Haematinic deficiency

### Case 11c.3: Excessive transfusion for folate deficiency

*A woman in her 70s and a low body weight of 29kg was admitted with symptoms of anaemia and a Hb of 61g/L. She received two units of red cells. On the following day she was reviewed by another consultant and was transfused a further two units. The post-transfusion Hb was 155g/L. Her anaemia was due to severe folate deficiency.*

Every year SHOT receives reports of over or avoidable transfusion for haematinic deficiencies. Patients are put at unnecessary risk as severe anaemia is associated with an increased risk of transfusion-associated circulatory overload and death (see Case 17a.1 in Chapter 17a, Transfusion-Associated Circulatory Overload (TACO)). A single unit transfusion followed by reassessment is safer where symptoms indicate a limited transfusion to be appropriate.

## Haemoglobin disorders n=2

Two patients with SCD were transfused excess red cells due to poor communication, staff misread the prescription in both cases.

One was an adult who was admitted with a sickle crisis and chest infection to a hospital unfamiliar with SCD (he was known to another tertiary centre). The laboratory was not informed of this diagnosis, so he did not receive appropriate phenotyped red cells; in addition, he received excessive transfusion requiring venesection. The other case involved a child with SCD who was overtransfused.

## Near miss cases n=1

An incorrect volume was prescribed for a child without taking into consideration the child's body weight. The consultant identified the error on a ward round and prevented the transfusion of the second unit of red cells.

## Conclusion

Transfusion in paediatric patients continues to be the main source of error reported in this section. Measures are needed to improve patient safety. This is a role for paediatricians and paediatric nurses as well as transfusion staff.

Blood loss in major haemorrhage in adults can be difficult to assess. Regular monitoring of blood parameters is recommended. Blood gas analysers may be used for this as long as they are quality assured for this purpose and the sample is handled correctly.

Unnecessary or excessive transfusion continues to be reported in patients with haematinic deficiencies, suggesting a reactive response in transfusing to correct anaemia rather than investigating and treating the cause (BSH Fletcher et al. 2022).

## Recommended resources

### SHOT Bite No. 4: Paediatrics

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

### Key information from the BSH paediatric guidelines

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



## Reference

BSH New HV, Berryman J, Bolton-Maggs PHB, et al. Guidelines on transfusion for fetuses, neonates and older children. *Br J Haematol.* 2016;**175(5)**:784-828.

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].

