

Quality Improvement Project to Evaluate and Improving the Safety of Blood Transfusions at Torbay Hospital

C. Webb, M. Parkinson, D. Krisanova, T. Choudary, R. Watts, O. Main, J. Pinder

Background and rationale

Patient Blood Management is an evidence-based approach based on NICE guidance,¹ aimed at optimising blood transfusion practice, reducing the number of inappropriate transfusions and improving patient safety.² This Quality Improvement project aimed to apply this guidance to everyday practice at Torbay Hospital.

Methods

The data for all transfusions within a 4-week time period in September 2021 were pulled, excluding the following:

- ✗ Those with an active major haemorrhage
- ✗ Paediatric patient group
- ✗ Those part of a chronic transfusion program
- ✗ Intra-operative transfusions

This was a total of 49 transfusions and 34 patients. For each of these, we looked at the patients notes, discharge summaries and blood test results to look at the below variables:

- Evidence that haematinics had been done within 28 days of the first transfusion (and if so, were there any deficiency requiring treatment. Had this been treated?)
- If the patient was able to consent, evidence of written and/or verbal consent.
- Evidence that body weight has been recorded within the transfusion documentation. Had the volume of transfusion been prescribed based on this body weight?
- Evidence of clinical review after each transfusion written within the notes

After analysing and obtaining the below results from 2021, a 'transfusion checklist' (as seen in figure 1) was then created and implemented to improve this practice.

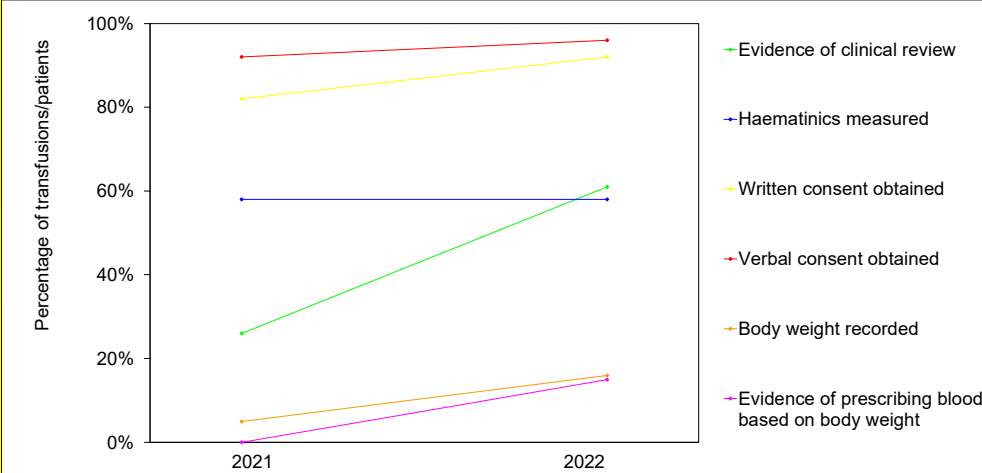
Nearly 6 months later, the same variables were then collected and analysed within a 2-week period in November 2022 (31 transfusions and 19 patients).

Results

The analysed results of the two separate periods of results are shown in graph 1.

Most of the variables improved after implementing the checklist, including consent, measuring of haematinics, and recording of body weight. The biggest improvement was seen in the number of post transfusion reviews, and this was particularly better in patients who had been prescribed multiple units from 21.4% (3) in 2021 to 71.4% (5) in 2022.

However, the number recording body weight remains very low. Equally, although the percentage of haematinics recorded prior to transfusion remained the same (in itself disappointing), the number of deficiencies picked up by recorded haematinics decreased from 90% (9) in 2021 to 80% (4) in 2022.



Graph 1: Results from 2021 and 2022 analysis

TRANSFUSION CHECKLIST

*** excludes major haemorrhage – please refer to appropriate protocol ***

Before prescribing the transfusion:

- Check haematinics for the patient and act on any abnormalities detected
- Send necessary G&S and X-match samples to the lab
 - o Label pink blood bottles in legible handwriting and send off with a paper request form in the bag. You can phone the lab to ask how many sample your need (i.e. if they have a recent G&S on the system you may only need to send one).
- Confirm transfusion is clinically necessary. Does the patient meet the following criteria:
 - o Hb <70
 - o Hb <80 with ischaemic heart disease
 - o Symptomatic anaemia.
 If not, consider alternative (e.g. iron transfusion? Does a transfusion need to happen now?)
- Send off FBC for pre-transfusion Hb within 24 hours before starting transfusion
- CONSENT the patient (verbal and written – see transfusion booklet)

Whilst prescribing the transfusion:

- Offer information leaflet to patient
- Document reason for transfusion (here and in notes – WHY are they anaemic):

- Prescribe volume of transfusion based on patient's body weight: _____ kg actual/estimated (please circle)
 - o 4 ml/kg = rise in Hb by ~10. Round this volume to the nearest full unit of blood (one unit contains 300 ml)

Please note that although you can prescribe more than 1 unit, do not give 2 units consecutively without a clinical review in between

- Consider Furosemide cover for patients at risk of TACO (guidance inside booklet)
- Phone blood bank to pre-alert them about the transfusion request, specifically mentioning the timeframe in which you need it (i.e. if urgent then alert ASAP). Please note that transfusions will not be done out of hours unless absolutely necessary (due to reduced staffing).

After EACH unit has been transfused:

- Perform a clinical review of the patient and document this (A-E assessment - any signs of overload/adverse reactions/improvement in anaemia-related symptoms?)
- Send off a post-transfusion Hb
- Consider the need for further transfusion *if necessary*

Figure 1: Image of the transfusion checklist implemented at Torbay hospital

Out of hours (OoH) transfusions?

As depicted in Graph 1, the percentage of transfusions which then had a clinical review was 61%. This can be compared with the same percentage of transfusions given OoH or at weekends.

	Percentage	Number of transfusions
Total number of transfusions	100%	31
Number of these with clinical reviews	61%	19
No of transfusions OoH (08:00-17:00)	45%	14
Number of these with clinical reviews	64%	9
No of transfusions on weekend	26%	8
Number of these with clinical reviews	38%	3

Figure 1: Image of the transfusion checklist implemented at Torbay hospital

Interestingly, percentage of post-transfusion reviews remained roughly the same when transfusions were done OoH, but this percentage reduced substantially when transfusions were given at weekend. This emphasises Torbay's (and likely other trusts) policies of not prescribing transfusions outside of normal working hours where possible, due to the reduced number of staff available to deal with potential complications and review post transfusion.

Consecutive transfusions

There were 7 consecutive transfusions (defined as a transfusion starting within 6 hours of the previous transfusion) in 2022 compared with 14 in 2021. The percentage of clinical reviews obtained within these units also improved.

Clinical review completed where subsequent units given (within 24 hours)?		Hb check where subsequent units given (within 24 hours)?	
2022 (14)	2023 (7)	2022 (14)	2023 (7)
3	5	5	3
21.4%	71.4%	35.7%	42.8%

This was particularly pleasing, as the checklist seemed to emphasise the culture or next prescribing consecutive units without review i.e. theoretically reducing the number of inappropriate transfusions.

Other interesting points...

As a point of interest, we also looked at the pre-transfusions haemoglobin (Hb) of patients being prescribed blood. NICE guidance states the threshold for transfusion is a Hb of <70g/L³, and Torbay guidance has the addition of anyone with a Hb of <80g/L with known cardiovascular disease.

Pre transfusion Hb range	No. of transfusions - 2022	No. of transfusions - 2023
21-30	1	0
31-40	0	0
41-50	2	1
51-60	4	1
61-70	21	13
71-80	10	6
81-90	1	3
>90	1	1

It would seem blood is being prescribed largely as per guidelines, but interestingly, there are patients being prescribed blood whose Hb is >90.

Ever wondered by how much Hb increases when giving a unit of blood?

There was an Hb average increase of 13.1g/L in 2021 and 12.7g/L in 2023.

Conclusion

The implementation of a transfusion checklist does indeed improve the safety of blood transfusions; making it more likely a prescriber performs a clinical review in between units (and by extension possibly reducing the number of unnecessary transfusions) and acting as a reminder to perform basic steps in consenting patients and checking haematinics. Clearly more work is still needed, particularly in the recording and prescribing based on body weight.

Recommendations

Next steps include offering teaching, particularly to junior doctors (the bulk of our prescribers), and aiming to circulate our checklist to a wider audience, possibly regional or national if possible.