12a Near Miss – Wrong Blood in Tube (WBIT) n=734

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Definition:

Blood is taken from the wrong patient and is labelled with the intended patient's details.

Blood is taken from the intended patient, but labelled with another patient's details.

Key SHOT messages

- Failure to adhere to safe procedures remains the major cause of WBIT
- The labelling of neonatal samples taken from the umbilical cord is prone to error when the sample is taken from the placenta away from the mother
- Use the sample circle, identify the patient fully and label the sample at the bedside

Figure 12a.1
The sample circle

All samples must be labelled at the patient side using positive patient identification.

Unlabelled blood samples MUST NOT leave the SAMPLE CIRCLE.

Unlabelled blood samples outside the circle should be disposed of.

Recommendations

- Accurate patient identification is fundamental for patient safety and patient identification errors must be avoided during blood sampling. This practice must be reinforced with all staff by mandatory transfusion training and be audited regularly
- Blood sample tubes must be labelled next to the patient and systems should be in place to facilitate this
- Hospital transfusion policies should include guidance for safe labelling of transfusion samples including cord blood

Action: Hospital chief executives, medical directors, nursing and maternity leads, hospital transfusion teams, all transfusion staff

Introduction

WBIT samples continue to be a problem with an increase in reports in 2021 (n=734) compared to 2020 (n=673). Cases from maternity departments make up a third of the reports. Sampling cord blood from the placenta is often done away from the patient's side, with risks of mislabelling, and this is a target area for improvement.

What errors lead to WBIT?

There were 265 incidents where the intended patient was bled but the tube labelled with another patient's details, 115 where an unintended patient was bled and 354 where it was not possible to determine either way.

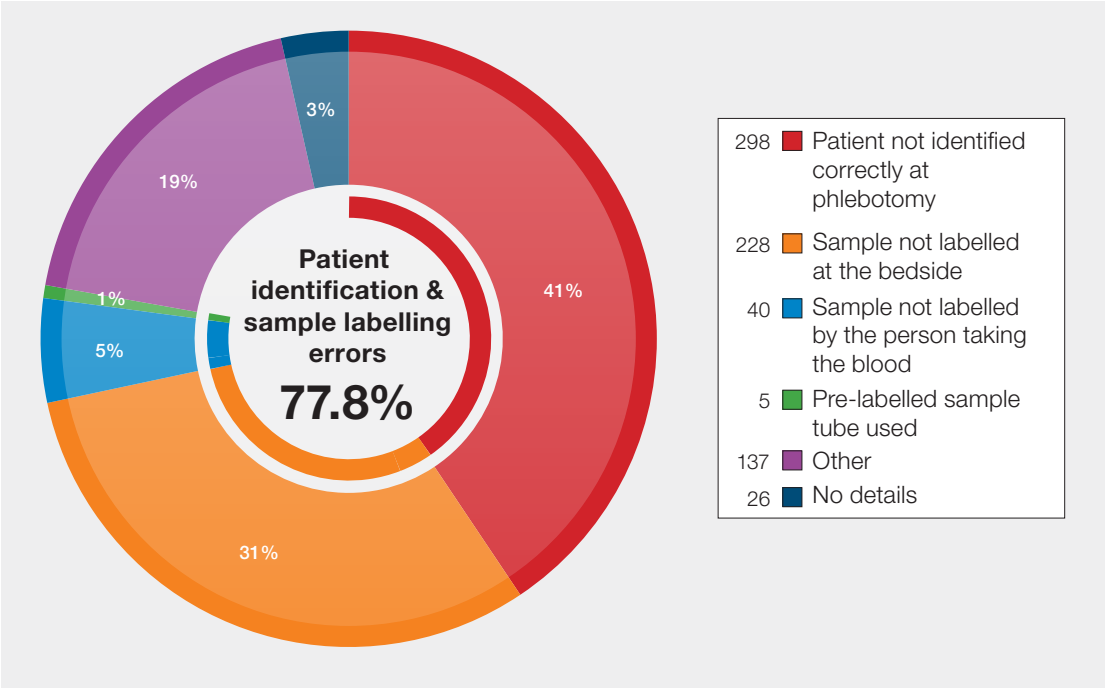
WBIT errors result from two main causes: failure to identify the patient correctly and labelling the blood samples away from the patient (total: 526/734, 71.7% of cases, Figure 12a.2). These errors frequently occur together: 125/734 (17.0%) had both these errors. Additional errors were identified in 440/734 (59.9%).

Maternity cases were reported for 257/734 (35.0%) similar to 2020. These included 33 errors involving neonates:

- Mother and cord mix ups n=16/33 (3 were investigated because the baby's group was not consistent with that predicted from cffDNA)
- Confusion in sampling from twins or triplets n=9/33
- Other reasons n=8

Overall, 526/734 (71.7%) were attributed to failure to identify the patient at the time of sampling or the sample was not labelled at the bedside.

Figure 12a.2: Primary errors leading to WBIT (n=734)



ABO-incompatibility

In 599 cases blood group data were provided. These data show that 278/599 (46.4%) could have received ABO-incompatible components with a risk of serious harm or death.

Table 12a.1: Potential for ABO-incompatible transfusion

		Blood group of the component that might have been transfused as a result of the WBIT					
		A	B	AB	O	Compatible	Incompatible
Patient blood group	A	54	33	11	133	187	44
	B	38	8	5	29	37	43
	AB	7	7	3	12	29	0
	O	142	39	10	68	68	191
	Totals	**241**	**87**	**29**	**242**	**321**	**278**

Who takes the samples?

As in previous years many errors are noted for midwives. Comparative data are available for all transfusion samples taken across the Oxford University Hospitals NHS Foundation Trust which cover a population of about 800,000 people and 7500 deliveries per year. As shown in Figure 12a.3, doctors and midwives are overrepresented compared with Oxford. Although other large hospitals use electronic systems (e.g., Norfolk and Norwich University Hospitals NHS Foundation Trust, King's College Hospital NHS Foundation Trust and University Hospital Southampton NHS Foundation Trust) they do not use them across all wards and departments so are unable to provide comprehensive comparative data.

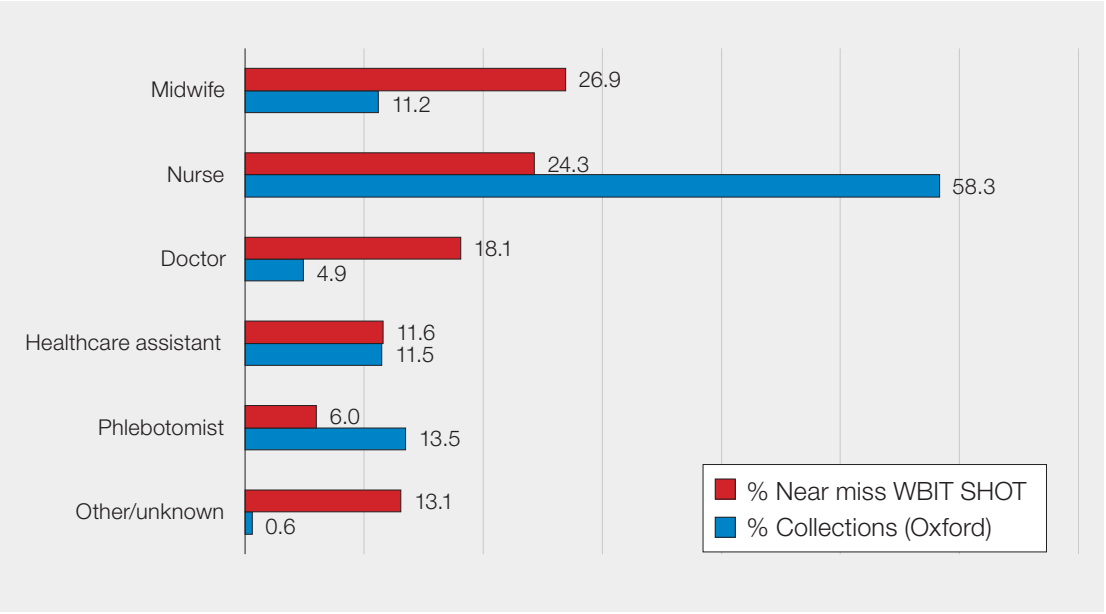


Figure 12a.3: Percentage of different healthcare professionals who took blood samples

WBIT=wrong blood in tube

The pattern of error varies in the different professional groups. WBIT attributable to phlebotomists are mostly caused by failure to identify the patient correctly. Three patients had been given the wrong request form and then their identity was not properly established. Other reasons noted included distraction, patients not being where they were expected to be on the ward, patients having similar names, assumptions that they had found the correct patient, staff shortages, unrealistic training expectations on an already short-staffed workforce and busy wards.

Midwives had a higher proportion due to sample not being labelled at the patient's side. In all groups there were cases reported with both errors.

Hospitals were asked whether they had a two-sample policy for patients receiving their first transfusion: 685/734 (93.3%) did, and 36/734 (4.9%) did not (13 did not answer); 269/685 (39.3%) were detected as a result of the two-sample policy. In 76 cases it was the second sample that was the WBIT.

There is paucity of information at a national level regarding the staff groups involved in taking transfusion samples. Previous Annual SHOT Reports have included data of staff groups involved in transfusion sampling provided by the Oxford Hospitals group for illustration, but this may not be truly representative across all NHS Trusts and Health Boards. Understanding patterns of errors in different clinical situations will help identify targeted interventions to improve practice. British Society for Haematology guidelines (BSH Robinson et al. 2018) must be followed to ensure safe practice.

Maternity cases

Case 12a.1: The cord blood sample was shown to be unrelated to the mother

Fetal genotyping in pregnancy predicted the baby to be D-negative. However, the cord and Kleihauer samples at delivery typed as D-positive. Samples from both mother and baby were referred to the Blood Service for investigation because of this apparent discrepancy. The two maternal samples pre and postnatal were from the same person, but the cord sample did not share at least one allele with the mother indicating that the cord was not related to the mother. The cord was female, and the baby was predicted to be male. The cord sample was from the placenta which was not sampled at the patient's bedside. The mother received anti-D immunoglobulin inappropriately. This maternity department is reviewing their procedures for sample taking and labelling for cord samples

Sampling the neonate's umbilical cord after the placenta had been removed to the sluice area and labelling this sample away from mother and baby was identified as a risk in several reports.

Case 12a.2: A WBIT in the setting of major haemorrhage identifies several errors

A major haemorrhage procedure was activated for a woman with a postpartum haemorrhage. Samples were sent to the transfusion laboratory with a request for two units of red cells. Two samples arrived in the same bag. The patient received two units of emergency group O D-negative red cells.

- *The switchboard operator did not wait to receive all the information, in particular the extension number to be used during the emergency. A bleep message using the extension number from labour ward from a call received earlier was sent erroneously. There was then a delay in the BMS establishing the correct contact number*
- *Maternal samples were taken by Midwife 1 and then handed to Doctor 1 who completed the details on the hospital transfusion request form and pre-transfusion sample. The mother was bleeding profusely, and Doctor 2 had to attend to her*
- *WBIT: one pre-transfusion sample was group O D-positive, but the other sample and the patient's transfusion history indicated that the patient was O D-negative (retrospectively known that one sample was the cord sample). The cord sample was taken by Midwife 2 but was not labelled immediately after the sample was taken. Doctor 2 then completed the details on the cord sample bottle with the mother's details (but no indication that this was the cord sample) and sent this to the transfusion laboratory with the other pre-transfusion sample (in the same bag)*
- *No patient identification details were completed on the traceability record that was returned to the transfusion laboratory. However, the donor number for the unit was documented in the transfusion record (which had patient identification details attached)*

The review noted the need for improved methods for labelling of cord samples and this was to be added to the agenda of a future hospital transfusion committee meeting.

Cases from other departments

Case 12a.3: Wrong practice was the norm, lack of safety culture in the organisation

An elderly man was admitted for surgery. A first sample was sent for grouping (O D-positive) and later two more were sent. Both these later samples were taken at the same time but labelled 15 minutes apart and were found to be a different group (A D-positive) compared to the first one. The newly qualified nurse (transfusion training had been suspended due to lack of resources) who took the sample had filled out the request forms later at the computer away from the patient. She selected the wrong patient details. She noted that 'the practice I have witnessed throughout my training and in our hospital is that blood sampling labels are not completed at the bedside, an action by many professionals, doctors and nurses. The ward was busy, and I was rushing to help the demand.' She was working in a different healthcare organisation from the one where she trained suggesting this poor practice was embedded in other hospitals.

Learning points

- Staff learn by watching and copying their peers and this can result in a drift into poor practice
- Workload and staffing contribute to workarounds that may not be safe
- Electronic identification systems are only safe when used correctly
- When the cord sample gives a result different from that predicted by cffDNA sampling, full investigation is needed
- Staff need to challenge unsafe practices and be aware of making assumptions and accepting established norms that are not based on guidelines

An international prospective study identified the same non-compliance errors or protocol violations in 260 WBIT reported from 36 centres in 11 countries (Dunbar et al. 2022). It was notable that in 43 cases the electronic positive patient identification was either not used when available or was used incorrectly. In this study 78% of samples were taken by nursing staff. Most WBIT errors had more than one contributing factor, mean 2.3 range 1 to 6.

Human factors

A review of the human factors questions related to WBIT can be found in the supplementary information on the SHOT website (https://www.shotuk.org/shot-reports/report-summary-and-supplement-2021/).

Impact of COVID

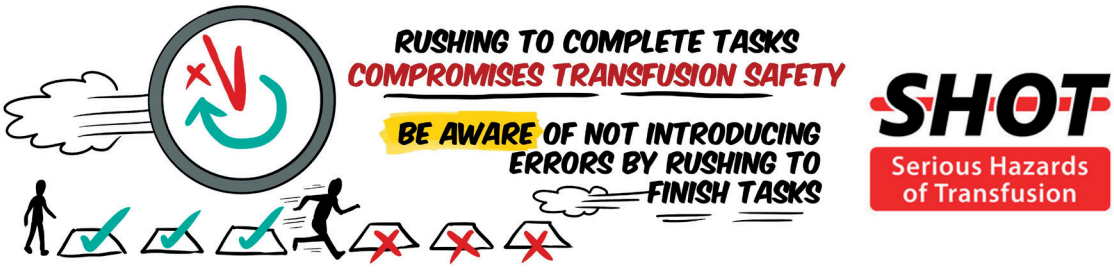
The COVID-19 pandemic continues to impact staffing levels and patient numbers within the NHS. This year 32 WBIT were attributed to COVID-19 due to either staffing pressures, increased workload, or issues with PPE, for example, glasses steaming up due to PPE leading to transcription errors.

Conclusion

The number of reported WBIT has increased in 2021. These are potentially dangerous errors as many could have resulted in ABO-incompatible transfusions. Failure to identify the patient correctly at the time of phlebotomy and failure to label the blood samples next to the patient continue to be the main factors contributing to these errors similar to previous Annual SHOT Reports. These poor practices should be addressed urgently to improve transfusion safety.

Maternity departments and clinics are particular high-risk areas. The HSIB published a report about a WBIT full blood count sample from a maternity unit where there was no patient harm (HSIB 2019). This illustrated many reasons why these errors can occur ('work as done' may not reflect 'work as imagined' in protocols) and recommended the use of electronic systems for patient identification and blood sample labelling. Additional recommendations for organisations from the HSIB report include human factors training, adequate staffing, provision of appropriate equipment and reduction in distractions.

Regardless of whether patient identification is manual or electronic, it is imperative that this is correctly determined. This is the simplest way of involving the patients in their own care and can prevent adverse clinical outcomes. Appropriate minimum identification criteria should be established and adhered to. WBIT events should be monitored, investigated using human factors principles and appropriate mitigating actions implemented.



Recommended resources

SHOT Bite No. 17: Near Miss
SHOT Bite No. 19: Human Factors
https://www.shotuk.org/resources/current-resources/shot-bites/

SHOT Safe Transfusion Checklist
https://www.shotuk.org/resources/current-resources/

Reference

BSH Robinson S, Harris A, Atkinson S, et al. The administration of blood components: a British Society for Haematology Guideline. *Transfus Med* 2018;**28(1)**:3-21. http://onlinelibrary.wiley.com/doi/10.1111/tme.12481/full [accessed 05 May 2022].

Dunbar NM, Kaufman R, WBIT investigators, et al. Factors associated with wrong blood in tube errors: An international case series – the BEST collaborative study. *Transfusion.* 2022;**62(1)**:44-50. https://doi.org/10.1111/trf.16716 [accessed 05 May 2022].

HSIB. Wrong patient details on blood sample (2019). https://www.hsib.org.uk/investigations-and-reports/wrong-patient-details-on-blood-sample/ [accessed 05 May 2022].