# 8 Incorrect Blood Component Transfused (IBCT) (clinical and laboratory errors)

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The category of incorrect blood component transfused is divided into instances where a wrong component is transfused (WCT) and those where the specific requirements are not met (SRNM).

## Definitions:

**Wrong component transfused (WCT):**
**Where a patient was transfused with a blood component of an incorrect blood group, or which was intended for another patient and was incompatible with the recipient, which was intended for another recipient but happened to be compatible with the recipient, or which was other than that prescribed e.g. platelets instead of red cells.**

**Specific requirements not met (SRNM):**
**Where a patient was transfused with a blood component that did not meet their specific transfusion requirements, for example irradiated components, human leucocyte antigen (HLA)-matched platelets when indicated; antigen-negative red cell units for a patient with known antibodies, red cells of extended phenotype for a patient with a specific clinical condition (e.g. haemoglobinopathy), or component with a neonatal specification where indicated. (This does not include cases where a clinical decision was taken to knowingly transfuse components not meeting the specification in view of clinical urgency).**

**DATA SUMMARY**
**Total number of cases: n=247**

| Implicated components | | Mortality/morbidity | |
|---|---|---|---|
| Red cells | 185 | Deaths definitely due to transfusion | 0 |
| Fresh frozen plasma (FFP) | 19 | Deaths probably/likely due to transfusion | 0 |
| Platelets | 20 | Deaths possibly due to transfusion | 1 |
| Cryoprecipitate | 0 | Major morbidity | 6 |
| Granulocytes | 0 | Potential for major morbidity (Anti-D or K only) | 1 |
| Anti-D Ig | 0 | | |
| Multiple components | 8 | | |
| Unknown | 15 | | |

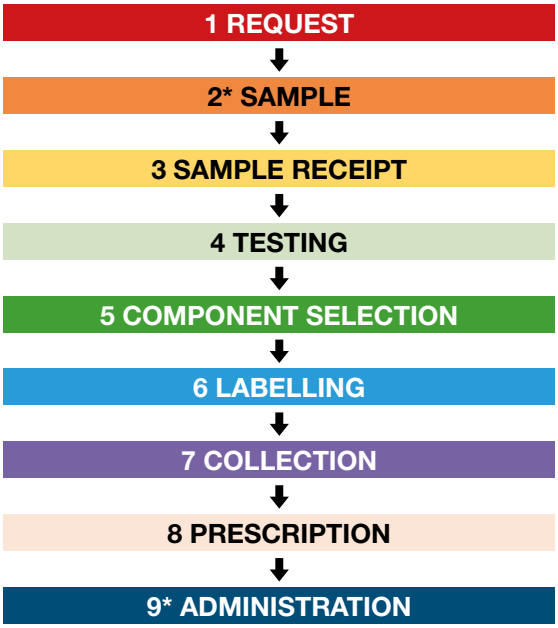
| Gender | | Age | | Emergency vs. routine and core hours vs. out of core hours | | Where transfusion took place | |
|---|---|---|---|---|---|---|---|
| Male | 120 | ≥18 years | 213 | Emergency | 32 | Emergency Department | 9 |
| Female | 125 | 16 years to <18 years | 5 | Urgent | 51 | Theatre | 18 |
| Not known | 2 | 1 year to <16 years | 11 | Routine | 132 | ITU/NNU/HDU/Recovery | 28 |
| | | >28 days to <1 year | 3 | Not known | 32 | Wards | 137 |
| | | Birth to ≤28 days | 11 | | | Delivery Ward | 11 |
| | | Not known | 4 | In core hours | 135 | Postnatal | 0 |
| | | | | Out of core hours | 35 | Medical Assessment Unit | 10 |
| | | | | Not known/Not applicable | 77 | Community | 1 |
| | | | | | | Outpatient/day unit | 19 |
| | | | | | | Hospice | 0 |
| | | | | | | Antenatal Clinic | 1 |
| | | | | | | Other | 0 |
| | | | | | | Unknown | 13 |

*(ITU=Intensive therapy unit; NNU=Neonatal unit; HDU=High dependency unit)*

This definition includes the following errors in the transfusion process:

- Phlebotomy errors leading to 'wrong blood in tube' (none reported in 2013)
- Laboratory procedural and testing errors
- Component collection and bedside administration errors
- Transfusion of components which did not meet the patient's specific requirement

Transfusion is a multidisciplinary activity with both the clinical and laboratory staff working in partnership as one integrated team. Each case that led to an incorrect blood component being transfused has been reviewed to find the steps where the error(s) could have been identified, Figure 8.1. These essential steps are clearly defined [23, 24] and should be followed using a checklist as previously recommended [21]. Each participant in the transfusion process is responsible for carrying out his/her own roles and ensuring that necessary checks are not overlooked and/or that no procedures are omitted.




** Critical points where positive patient identification is essential*

**Figure 8.1: Steps in the transfusion process**

The definitions of the steps in the transfusion process can be found in the British Committee for Standards in Haematology (BCSH) Guideline on Administration of Blood Components [23]. A complete summary and classification of all laboratory incidents is found in Chapter 9 Summary of Events Originating in the Hospital Transfusion Laboratory.

## Overview

There were 247 reports where patients received an incorrect blood component (Table 8.1a, 57 reports where a wrong component was transfused and Table 8.1b, 190 reports where the patient's specific requirements were not met).

Patient ages ranged from birth to 95 years (median 54 years). Thirty cases were reported in children, 6 ABO/RhD errors in transplant cases, and 37 SRNM transplant-related cases. These are discussed in Chapter 25 Paediatric Cases, and Chapter 27 Summary of Incidents Related to Transplant Cases.

## Table 8: An overview of incorrect blood components transfused n=247

Table 8.1a: Wrong component transfused n=57

| Outcome | No. of reports | Blood component |
|---|---|---|
| ABO incompatible | **12*** | |
| | 9 | Red blood cells (RBC) |
| | 3 | FFP |
| ABO non-identical | **7** | |
| | 4 | RBC |
| | 2 | Platelets |
| | 1 | FFP |
| RhD mismatch | **8**** | |
| | 6 | RBC |
| | 2 | Platelets |
| Wrong component type | **17** | |
| | 3 | Cryoprecipitate |
| | 5 | RBC |
| | 2 | FFP |
| | 7 | Platelets |
| ABO identical | **8** | |
| | 7 | RBC |
| | 1 | FFP |
| Spiked prior to pre-administration checks (will be classified as 'near miss' in future) | **5** | |
| | 4 | RBC |
| | 1 | Platelets |
| **Total wrong components transfused** | **57** | |

**3 ABO incompatible transfusions related to transplant cases, (2 HSCT patients and 1 liver transplant patient)*

***3 cases RhD mismatched blood components transfused to HSCT patients*

Table 8.1b: Specific requirements not met n=190

| Location of error | No. of reports |
|---|---|
| Clinical | 134 |
| Laboratory | 56 |
| **Total specific requirements not met** | **190** |

*Please see Table 8.6 for a full breakdown of specific requirements not met*

# Deaths n=1

An ABO incompatible red cell transfusion which occurred as a result of an administration error may have contributed to the death of an already very sick patient.

### Case 1: ABO incompatible transfusion which may have contributed to death

*Two patients with the same surname were in adjacent beds. Blood was correctly collected for Patient M and taken to the ward. The blood intended for Patient M (patient group AB RhD negative) was checked at the nurses' station but was transfused to Patient J (patient group O RhD positive). The error was detected after infusion of 35mL and the transfusion was stopped. Patient J was already very unwell pre transfusion but deteriorated quickly with an unrecordable blood pressure, chest pain, a deteriorating conscious level and also stopped passing urine. The recipient's subsequent blood samples all showed evidence of frank haemolysis. The patient already had advanced heart failure and renal failure but died 3.5 hours after transfusion.*

## Learning point

- Pre-administration transfusion checks must be undertaken at the bedside. This is the final opportunity to detect a wrong transfusion. The essential steps are outlined in the British Committee for Standards in Haematology (BCSH) guideline for the administration of blood components [23] and the Handbook of Transfusion Medicine [24]

## Major morbidity n=6

Three cases of ABO incompatible red cell transfusions (2 clinical, 1 laboratory error) led to haemolysis necessitating admission to the HDU, and 3 other laboratory errors resulted in K-sensitisation in women of childbearing potential.

**Case 2: Collection slip error leads to a patient being transfused ABO incompatible blood labelled for a different patient**

*A patient was transfused blood which had been crossmatched and labelled for another patient. The error was noticed only when a second unit of blood was delivered to the ward (so missed on the first occasion at the final bedside check). The patient's blood group was O RhD positive and the red cell unit was A RhD positive. The staff nurse had put incorrect patient details on the collection slip. Staff failed to notice that the wrong unit had been collected. The patient developed jaundice and other evidence of intravascular haemolysis requiring admission to the HDU.*

## Learning point

- Any blood component that is delivered to the clinical area must be checked and received by a 'trained and competent member of staff' [25]

**Case 3: ABO incompatible transfusion despite a robust system of warning alerts on the laboratory information management system (LIMS)**

*An ABO incompatible red cell unit was transfused resulting in a haemolytic transfusion reaction. The blood was issued using an emergency protocol on the LIMS, which was not appropriate for the non-urgent clinical situation, and the computer warning flag stating that the units were incompatible was overridden several times by the biomedical scientist (BMS). This incompatibility was not noted at the bedside and when the patient reacted to the transfusion, the doctor who was consulted advised that the transfusion should continue without reviewing the patient. The patient developed acute and delayed haemolysis, but no long-term sequelae.*

## Learning points

- Warning flags should not be overridden or ignored without laboratory staff understanding the significance of this action and the potential for harm. Use of automation and information technology (IT) can increase the security of component selection and testing but only if the displayed warning flags are heeded and acted on appropriately. If warning flags are overridden, which they may need to be in a clinical emergency, a positive response as to why they are being overridden must be entered. It should not be possible to simply 'escape' past a warning flag
- Continuation of a transfusion and clinical advice about transfusion reactions should not be given without reviewing the patient
- The laboratory information management system (LIMS) should be used as much as possible to help prevent mistakes by laboratory staff. There are many rules to remember during component selection so that a timely prompt based on, for example, the age and/or sex of a patient can be very helpful
- The Handbook of Transfusion Medicine states: p10: 'Robust identification procedures outside the laboratory at collection of blood from the hospital transfusion laboratory and administration of blood at the bedside are vital' [24]

## ABO incompatible transfusions n=12

There were 9 ABO incompatible red cell transfusions and 3 incompatible FFP transfusions. In 5/12 there were clinical errors; 3/5 combined collection and administration errors and 1/5 an administration error alone. The final case in this group is discussed below (Case 4).

**Case 4: Group O FFP issued on limited information available in an urgent situation**

*A 52 year old patient was transfused with emergency O RhD negative red cells (own group A RhD positive but not known until later) and also received group O FFP. Some emergency O RhD negative red cell units were transfused before a grouping sample was taken and sent to the laboratory. The group therefore appeared to be O by immediate spin technique because of the recently transfused group O blood. The laboratory was not informed that the sample was taken post transfusion nor that the patient had received emergency O RhD negative units. Two units of group O FFP were transfused. The true patient group was A RhD positive.*

This shows the importance of communication between clinicians and laboratory staff in an emergency. There was no historical record available for the patient and laboratory staff issued FFP based on the misleading grouping result. The internal standard operating procedure (SOP) for use of group O blood in emergency situations did not stipulate what to do if the group was unclear, and also did not advise what group of FFP to give in an emergency (which should be AB or group A if AB is in short supply). It is essential to take a group and screen sample before transfusion, see learning points below.

In a further 7/12 reports, the error occurred in the transfusion laboratory. Three resulted in transfusion of an inappropriate ABO group to haematopoietic stem cell transplant and solid organ transplant patients (Chapter 27 Summary of Incidents Related to Transplant Cases). In the remaining 4/12 cases (non-transplant patients), 2 were due to errors in component selection (Case 3 described earlier) and 2 in testing. In 3 of 4 cases the error occurred over a weekend and involved staff who do not routinely work in blood transfusion. In 2 of 4 cases the error could have been detected during the final pre-administration checks.

| Location of error | Error | Patient group | Unit group |
|---|---|---|---|
| Clinical | Collection & administration | O RhD positive | A RhD positive |
| Clinical | Collection & administration | O RhD positive | A RhD positive |
| Clinical | Collection & administration | B RhD positive | A RhD positive |
| Clinical | Collection & administration | O RhD positive | AB RhD negative |
| Laboratory | Component selection | O RhD positive | A RhD positive |
| Laboratory | Testing | A RhD positive | AB RhD positive |

**Table 8.2: ABO incompatible red cell transfusions 2013 n=9 (6 discussed here and 3 in Chapter 27 Summary of Incidents Related to Transplant Cases)** (4 clinical, 5 laboratory errors)

Three additional laboratory cases (summarised below) are discussed in Chapter 27 - Summary of Incidents Related to Transplant Cases.

| Transplant cases | | Patient group | Donor group | Unit group |
|---|---|---|---|---|
| Laboratory | Component selection | B | O | B |
| Laboratory | Component selection | A | O | A |
| Laboratory | Component selection | A | O | A |

**A group compatible with both patient and donor should be transfused, usually group O*

In two of the laboratory cases group O FFP was selected during an emergency, one for transfusion to a premature baby born at 29 weeks' gestation who was critically ill (group A RhD positive) and the second to an unknown male (group B RhD positive). In both cases no pre-transfusion sample was available. Group O FFP is only compatible for patients who are group O.

Good communication between clinicians and the laboratory is essential, particularly in an emergency.

## Learning points

The following learning points have been extracted from the British Committee for Standards in Haematology (BCSH) Guidelines for pre-transfusion compatibility testing [19]

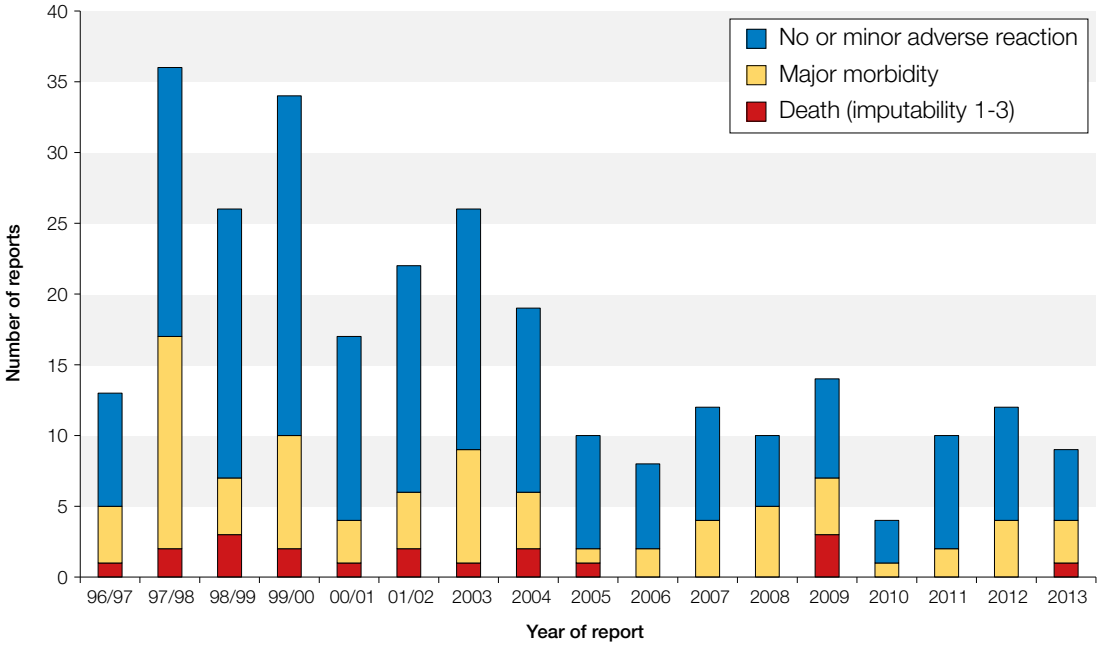
- Emergency groups performed MUST include a test against anti-A, anti-B and anti-D with appropriate controls or reverse group, if there is insufficient time for this level of testing then group O red cells must be issued
- In an emergency, or if the group is unclear, the safe group of fresh frozen plasma (FFP) to give is group AB or group A (because AB is often in short supply), but not group O. Group O FFP should be reserved for patients confirmed to be group O and is not suitable for use in the emergency setting where the blood group is unknown. Laboratory protocols for emergencies should clearly state this
- The ABO and RhD group should be verified against historical patient results
- If it is not possible to obtain a reliable reverse grouping result and there is no historical group against which to validate, the cell group must be repeated
- A second, group check sample should be sought and tested as soon as possible

ABO incompatible red cell transfusions are one of the most feared outcomes of errors in the transfusion process. Review of cumulative data from SHOT reports shows a reduction after 2004 but a relatively constant number since then (Figure 8.2). There were a total of 14 deaths in the years before 2005, but 5 in the following 9 years.

It is interesting that overall, 66.3% (187/282) of these transfusions had no, or very minor, adverse effects, although every ABO incompatible transfusion carries the risk of death or major morbidity. Death occurred in 6.7% (19/282) and major morbidity in 27.0% (76/282). ABO incompatible blood component transfusions are defined as 'never events' when causing death or severe harm which means that only a third (95/282, 33.7%) will be reportable to National Health Service (NHS) England. Only 2 such incidents are recorded in the National Reporting and Learning System (NRLS) for the period 1 April 2013 to 30 September 2013 (one case of group A to a group O patient, and one case of group A

given to a group B patient), and 2 incidents in 2012 (which do not quite match SHOT data). NHS England are planning to publish more detailed information on never events starting in April 2014 (see http://www.england.nhs.uk/ourwork/patientsafety/never-events/ne-data).

**Figure 8.2: Most ABO incompatible transfusions are not associated with serious outcomes**




*Note: from 1998/99 to 2003 the SHOT reports do not specify whether the deaths and major morbidities were caused by red cells or other component types*

All incidents resulting in death or severe harm should be reported to the NRLS who then report them to the Care Quality Commission (CQC), and most incidents are submitted to the NRLS electronically from local risk management systems. Recent data for England and Wales from the NRLS in 2012, show that most events were 'patient accidents' (347,172) accounting for about 25%, and the groups 'medication' (154,895) and 'treatment, procedure' (143,150) for about 10% each. (Total events 1,293,843). NRLS Quarterly Data workbook up to September 2012 (http://www.nrls.npsa.nhs.uk/resources/collections/quarterly-data-summaries/?entryid45=135212).

## Potential for major morbidity n=1

**Case 5: Inadequate bedside check leads to potential RhD sensitisation of a woman of childbearing potential and a near miss ABO incompatible transfusion in a second patient**

*Two units of red cells were delivered to the ward for 2 patients requiring transfusion; Patient X (A RhD negative) and Patient Y (O RhD positive). Nurse 1, caring for Patient X, asked Nurse 2 to check a unit of red cells with her. They both went to Patient X with the unit (labelled for Patient Y) and the case notes of Patient X. They asked the patient to state her name and date of birth. Nurse 2 checked the patient identification (ID) on the wristband but not on the compatibility label attached to the unit. Nurse 2 (as co-checker) took the unit of blood from Nurse 1 and checked the expiry date. Nurse 1 caring for Patient X then attached the bag of red cells for Patient Y to Patient X. The error was discovered by Nurse 3 during the bedside checks for Patient Y. This nurse realised that the wrong bag of blood had been attached to Patient X. The 2 nurses involved in the incident were up to date with their mandatory transfusion training but out of date with their competency-assessments (as were all the staff on this ward). The patient received 4500IU of anti-D immunoglobulin to cover this sensitising event.*

There were two errors: only 1 component should be collected from the laboratory at one time, and there was failure to correctly identify the patient - at no point did either nurse check that the patient details (Y) on the attached compatibility label matched the identity details given by the patient or the wristband.

## RhD mismatches n=8

In 2 cases patients were transfused RhD mismatched components due to errors in the clinical area. One is Case 5 above. In the second case, the result from a pre-admission clinic sample (O RhD negative) was discrepant with the historical record (O RhD positive, together with a record of a transfusion in 1999 with three O RhD positive red cell units). It was concluded that the 1999 sample was probably a 'wrong blood in tube' incident but the sample was grouped manually at that time without any duplicate testing therefore there can be no conclusive proof that the original was a 'wrong blood in tube'. The recent O RhD negative result was confirmed by a further sample from the patient.

In 3/8 the wrong RhD group was given to transplant patients, two due to failure to consult the patient's historical record at the time of sample receipt and registration and 1 due to component selection. In the remaining 3/8 cases (2 females of childbearing potential and 1 male) the patients received RhD mismatched red cells, 2 due to RhD grouping errors during testing and 1 due to a component selection error.

## Wrong component type transfused n=17

In 17 cases an incorrect component type was requested, issued or administered to the patient. In 5 cases the error originated in the laboratory, but only 1 of 5 could reasonably have been expected to have been identified in the clinical area (the BMS issued FFP instead of cryoprecipitate). In 2 of 5 instances cryodepleted plasma was issued instead of cryoprecipitate, and in 1 of 5 an inappropriate component was selected for neonatal exchange transfusion. In the 5$^{th}$ instance the BMS failed to follow procedure and placed uncrossmatched O RhD negative blood in the issue refrigerator as a temporary measure due to the pressure of dealing with several emergencies. A porter then collected the uncrossmatched units thinking they were 'emergency O RhD negative units'.

| Urgency | Required | Administered |
|---|---|---|
| Emergency | Platelets | FFP |
| Emergency | Platelets | FFP |
| Emergency | RBC paediatric emergency O RhD negative | RBC adult emergency O RhD negative |
| Emergency | Platelets | FFP |
| Emergency | RBC paediatric emergency O RhD negative | RBC adult emergency O RhD negative |
| Emergency | RBC for intrauterine transfusion | RBC paediatric O RhD negative |
| Urgent | Platelets | FFP |
| Routine | Platelets | RBC emergency O RhD negative |
| Routine | Platelets | RBC |
| Routine | Platelets | RBC |
| Routine | FFP | Platelets |
| Routine | FFP | Platelets |

**Table 8.3: Wrong component type transfused due to collection and administration errors n=12**

In 12 cases a combination of collection and administration errors contributed to the incorrect component type being administered, confusion between platelets and FFP being the most common mistake. The component that was collected had not been prescribed in 7 of 12 cases. In 4 of 12 cases, the collector selected a component type other than the one intended and in 1 of 12 cases, a paediatric emergency red cell unit was collected and transfused when there was time to order and receive a unit specific for intrauterine transfusion.

**Case 6: Lack of component knowledge leads to the incorrect component type being transfused**

*The patient was prescribed two units of platelets before surgery. Red cells were also reserved because he had irregular red cell antibodies. The staff gave two units of red cells thinking that the 'optimal additive solution' meant that the bag contained platelets. They tried to give each bag of red cells over 30 minutes as this is the time stated on the prescription for transfusion of platelets. The error was detected by a doctor when taking a blood sample to measure the platelet increment.*

The two nurses did not recognise that incorrect component had been collected and transfused. This demonstrates inadequate training for transfusion practice.

### Learning point

- All members of staff who participate in blood transfusion must know how to identify all the component types (illustrated in [26]) and know their individual storage requirements

## Units spiked before pre-administration checks - wrong transfusion or near miss? n=5

There were 5 instances where a blood component was 'spiked' prior to the completion of pre-transfusion checks at the patient's side.

It can be difficult to define exactly the point at which a transfusion has started. SHOT has used the International Society of Blood Transfusion (ISBT) definition, which considers transfusion to have started when the unit is spiked. That means a few cases in this and previous Annual SHOT Reports are categorised as IBCT incidents, even though the reporters are quite clear that no part of the component was given to the patient. Following a discussion at the SHOT Working Expert Group in February 2014, it was decided that in future such cases should be categorised according to how the unit was fated. Therefore, from 2014 incidents will be categorised as near miss if the spiked unit is fated as wasted, rather than transfused.

These 5 cases would then be classified as 'near miss' rather than 'wrong component transfused'. This decision was made after the numbers of cases were collated for 2013 and so, for this report, remain in IBCT.

In 4/5 reports a collection error led to the wrong unit reaching the bedside. This was then compounded by failure to complete the pre-administration checks before 'spiking' the unit. In one case an ABO incompatible red cell transfusion would have occurred had the error not been detected just in time.

**Case 7: A patient nearly receives an ABO incompatible transfusion**

*Staff on the day unit requested a unit of red cells for a patient attending the following day. The night porter collected the unit and delivered it to the ward. Two patients shared the same first name but all other identifiers were unique to each patient. The porter was distracted by the bleep during the collection and stated that the collection form was poorly printed and difficult to read. The error was missed when the red cell unit was received on the ward but the discrepancy was detected by the second checker at the bedside. The blood collected was group A RhD positive but the patient's group was O RhD positive. When the error was detected the giving set had already been inserted into the unit.*

### Learning point

- Components should not be 'spiked' until the patient is ready to receive the transfusion and the pre-administration checks have been completed at the patient's side

## Near miss WCT cases n=715

| Point in the process | Type of error made | Number of cases | Percentage of cases |
|---|---|---|---|
| Sample taking | Wrong blood in tube (WBIT)* | 637 | 89.1% |
| Sample receipt | Entered to incorrect patient record | 5 | 0.8% |
| | Incorrect patient administration system (PAS)/ LIMS merge | 1 | |
| Testing | Misinterpretation | 5 | 2.2% |
| | Incomplete testing prior to issue | 4 | |
| | Manual group error | 3 | |
| | Transcription | 3 | |
| | Unknown ABO testing error | 1 | |
| Component selection | RhD+ issued to RhD- patient | 3 | 1.0% |
| | Incorrect component type | 2 | |
| | Wrong ABO group selected | 2 | |
| Component labelling | Transposition labels between patients | 7 | 1.4% |
| | Component mislabelled | 3 | |
| Collection | Collection incorrect unit | 20 | 4.8% |
| | Wrong details on collection slip | 7 | |
| | Wrong units sent to ward | 7 | |
| Administration | Attempted admin wrong patient | 4 | 0.6% |
| Other | IT bug in LIMS system | 1 | 0.1% |
| **Total** | | **715** | **100%** |

**Table 8.4: Near misses that could have led to incorrect blood component transfusions n=715**

** 6 other WBIT incidents could have led to avoidable transfusions and are discussed in Chapter 11, Avoidable, Delayed or Undertransfusion (ADU)*

## Wrong blood in tube near miss errors potentially leading to incorrect blood components transfused n=637 (6 near miss avoidable transfusions, total WBITS n=643)

### Definition of wrong blood in tube incidents:

- 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

If the transfusion process begins with a sample of the wrong patient's blood, there is no guarantee that the error will be detected, so there is a potential risk of an incorrect blood component transfusion. This includes the risk of death or severe harm as a result of an ABO incompatible red cell transfusion, which is a Department of Health 'never event' [27]. There has been an increase in the number of reported near miss WBIT incidents which are 64.6% (643/996) of all near misses in 2013 compared with 51.5% in 2012 (505/980) and 43.4% (469/1080) in 2011. It is likely this increase is due to a number of factors:

- A group check sample being taken more often, either as a result of compliance with the BCSH compatibility guidelines [19] or to enable electronic issue
- Increased awareness of both the danger of WBIT incidents and the requirement to report them to SHOT

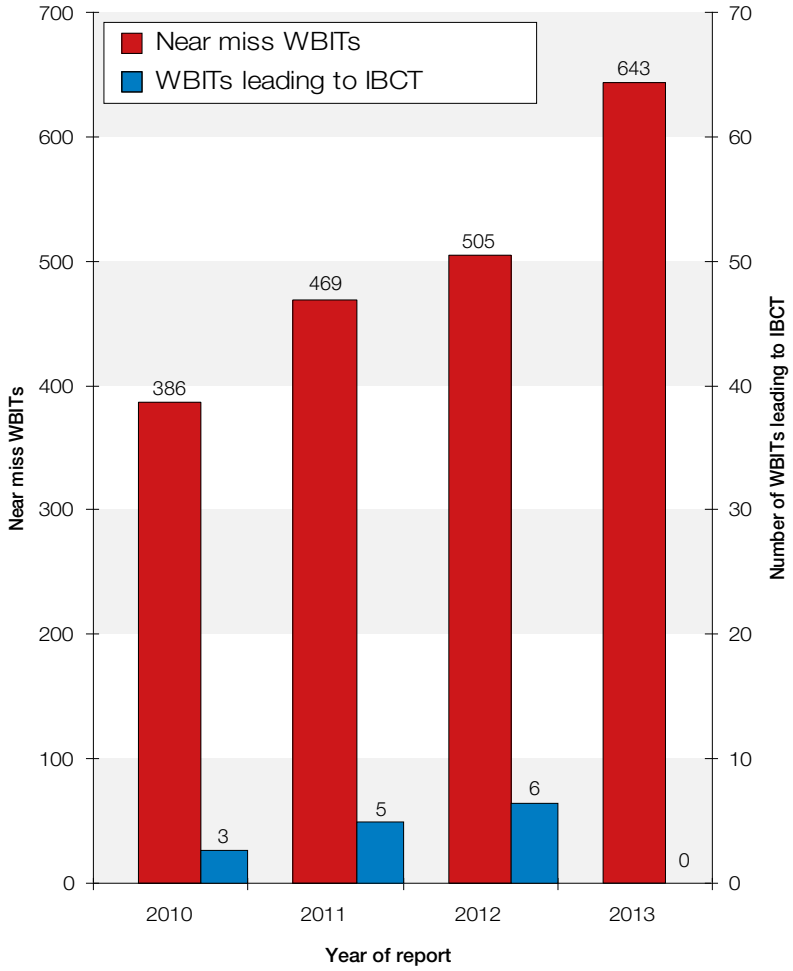
In 2013 there were no proven cases of WBIT (one possible, see RhD mismatch above) that actually resulted in an incorrect blood component being transfused, which is a change from previous years. Reports to SHOT between 2010 and 2012 indicated approximately one incorrect blood component transfused due to a WBIT error for every 100 near miss incidents. However, in 2013 there were 643 reported WBIT near misses, but no confirmed transfusions of an incorrect blood component (Figure 8.3). The 2012 BCSH pre-transfusion compatibility guidelines [19] recommend that a group check sample should be requested for confirmation of the ABO group of a first time patient, but a single year's data

are not sufficient to know if this important patient safety measure has been responsible for the absence of incorrect transfusions as a result of WBIT.

**Case 8: Group check sample was also WBIT**

*Two samples were received on a first time patient in the emergency department. Both samples were taken by same person but at different times. Both grouped as A RhD negative. The patient was about to be listed for trauma surgery (fractured neck of femur), so a further sample was received from the ward, but this grouped as O RhD positive. It was suspected that the O RhD positive sample was wrong, as there had been two previous A RhD negative samples, but two further samples grouped as O RhD positive. Group checks on haematology and chemistry samples confirmed all original samples were WBIT. The patient was due to go to theatre in the morning, but was delayed until the group could be confirmed.*

**Figure 8.3: Cumulative comparison of near miss WBIT and those leading to IBCT**




## Detection of WBIT incidents:

The point of detection of WBIT incidents and the manner by which they were discovered show the importance of the quality processes and checks undertaken by all staff involved in transfusion, both laboratory and clinical. Unfortunately, it is also inevitable that many similar incidents will remain undetected.

| Point in the process | How was WBIT error detected | Number of cases | Percentage of cases |
|---|---|---|---|
| Sample receipt | Error discovered prior to testing | 38 | 13.6% |
| | Sample taker realised error | 36 | |
| | Detected by chance before booking in | 12 | |
| Testing | At authorisation of results | 242 | 83.5% |
| | Unknown point during testing | 198 | |
| | Sample taker realised error* | 34 | |
| | Further sample differed | 32 | |
| | Other colleague realised error | 15 | |
| | Alerted by a non-transfusion sample | 11 | |
| Collection | Attempted collection with different patient's details | 2 | 0.3% |
| Administration | Pre-administration checks | 7 | 1.7% |
| | Sample taker realised error | 4 | |
| Other | After report issued | 4 | 0.9% |
| | Patient realised | 2 | |
| **Total** | | **637** | **100%** |

**Table 8.5: Point in the transfusion process where the wrong blood in tube incident was detected**

** In 1 wrong blood in tube case the sample taker alerted the laboratory before testing, but the sample was erroneously tested anyway and the error was detected at authorisation*

**Case 9: Pre-labelled tubes for maternal and paternal samples lead to WBIT detected during testing**

*A mother and father were bled at the same time for fetal blood group genotyping. A midwife pre-labelled tubes with letters 'M' and 'F' to indicate 'male' and 'female', but no other identifying details. These were interpreted as 'M' for 'mother' and 'F' for 'father' at the point of sampling. Tubes marked 'F' were labelled by the consultant with 'female' (mother's) details. The midwife labelled the remaining tubes marked 'M' with 'male' (father's) details. The error was detected when it was apparent from chromosome testing that the male and female karyotypes did not correspond with the sample labelling. Further checks against historical blood groups for both individuals indicated the samples had been transposed.*

## IT-related WCT cases n=8

There were 8 IBCT-WCT cases that also had an IT element and these are described below. The numbers are included in tables above where appropriate, so these are not additional cases.

### Warning flags not in place, not heeded or not used (n=7 for laboratory WCT)

There were 2 cases where a warning flag was in place but not heeded. In one of these an IT flag was overridden several times, but could have prevented a wrong blood incident had it been heeded, Case 3.

Five incidents of incorrect blood component transfusion occurred in haemopoietic stem cell transplant patients. On three occasions an apparently robust flagging system was overlooked because there were too many separate flags in place and one of the requirements was missed and on two other occasions the LIMS was not updated to reflect the current status of the patient.

## Learning points

- Training and competency-based assessment must include appropriate actions on receipt of alerts/warnings on the laboratory information management system (LIMS) or other analyser
- Where a computer warning system designed to prevent wrong blood incidents does not work in the way it was intended, an audit of the system should be undertaken to highlight any other cases that might have been missed in a similar way

### Electronic blood management systems n=1 (clinical WCT)

There was a blood collection error during downtime of the blood-tracking system.

**Case 10: Wrong blood collected from a satellite refrigerator during the downtime of a blood-tracking system**

*A porter who was aware that the blood-tracking system was down delivered blood for two patients to a satellite refrigerator. Only one of the wards was aware that the system was down and familiar with the procedure to follow when collecting blood under these circumstances. The staff member from the other ward was not familiar with the paper log, which did not contain the full patient ID, only the donation number, and collected the wrong blood. This was not detected at the bedside because the wrong checking procedure was followed.*

## Learning point

- Downtime procedures for all information technology (IT) systems should be validated so that they are sufficiently robust and staff should be trained to use these procedures

## Specific requirements not met

There were 190 cases where patients received blood components that did not meet their specific requirements.

Table 8.6: Specific requirements not met n=190

| Type of specific requirement | Number of laboratory reports | Number of clinical reports | Total |
|---|---|---|---|
| Specific phenotype of red cells | 25 | 6 | 31 |
| Irradiated units | 8 | 111 | 119 |
| Cytomegalovirus (CMV) negative units | 1 | 7 | 8 |
| Both irradiated and CMV negative units | 1 | 2 | 3 |
| K negative units to female of childbearing potential | 7 | 0 | 7 |
| Pathogen-inactivated FFP or cryoprecipitate | 7 | 1 | 8 |
| HLA-matched platelets | 1 | 1 | 2 |
| Human platelet antigen (HPA-1a)-matched platelets | 0 | 1 | 1 |
| Apheresis platelets | 1 | 0 | 1 |
| Inappropriate use of electronic issue (EI) | 5 | 0 | 5 |
| Blood warmer required | 0 | 5 | 5 |
| **Total** | **56** | **134** | **190** |

Failure to provide irradiated cellular components remains the most commonly missed specific requirement. Most of these (113) are due to clinical staff failing to indicate this specific requirement on the request form. A further 9 cases occurred because laboratory staff failed to heed the information for irradiated components at sample receipt and registration.

## Learning point

- Prior to collection of a blood component for transfusion, the prescription should be checked by the staff who will be setting up the transfusion to ensure that the components have been authorised or prescribed for transfusion to that patient and they are of the correct specification for the patient

**Case 11: The patient identifies the need for specific requirements during transfusion**

*A patient with chronic lymphatic leukaemia and chronic anaemia was admitted to the emergency department and required an urgent transfusion of two units of red cells and platelets. The specific requirement box was not ticked on the request. The sample was processed and components issued.*

*The first unit of blood was in progress when the patient asked if the blood was irradiated. The nurse said 'no' and stopped the transfusion. The nurse contacted the transfusion laboratory who had no notification for irradiated components. The units were recalled to the laboratory and irradiated components were issued.*

The patient knew of his specific requirement and this information should have been noted when obtaining consent. The requirement for irradiated components was also omitted from the prescription and therefore it was not noted during the final pre-administration checks until the patient alerted the nurse.

## Learning points

- It is the requesting clinician's responsibility to identify the patient's specific requirements (if any) and communicate them by the request form to the laboratory and also on the prescription for the administering staff to ensure these needs are met
- The patient should be asked if he/she knows of any specific requirements at the time of giving consent for transfusion

SHOT has previously recommended [3] (page 76) that hospital transfusion teams should risk-assess the methods that clinicians use for informing the transfusion laboratory about both specific requirements, and any relevant previous history provided by the patient to clinicians. For example, there should be a robust process to inform the laboratory when treatment with purine analogues starts, rather than waiting until blood is requested.

**Case 12: A patient with Hodgkin lymphoma received non-irradiated red cells**

*An IT prompt displayed on screen alerting the BMS to activate a flag for irradiated components was not added to the patient record at sample registration. At crossmatch the BMS did not consider the clinical details or check legacy data prior to selection of red cells. Staff on the ward noticed that red cells were not irradiated during the final pre-administration checks and bleeped the doctor and the laboratory to confirm whether the patient did require irradiated blood. The laboratory staff checked the LIMS and stated that no special requirements were recorded on the system (as the BMS had not set up the flag following a request), so the transfusion was started. The doctor arrived later on the ward and confirmed the patient did need irradiated blood. The transfusion was immediately stopped but more than 200mL had been transfused.*

## Learning points

- Training and competency-based assessment must include appropriate actions by the biomedical scientist (BMS) on notification of requests for alerts/warnings to be put onto the laboratory information management system (LIMS) or other analyser
- Qualified BMS crossmatching red cells or issuing components must take responsibility for checking **all** the relevant laboratory history on a patient to ensure that they issue components of the correct specification, for genuinely unknown patients the minimum identifiers are gender and a unique number

### Incorrect phenotype

In 25 cases the BMS issued components of the incorrect phenotype. Most of these were due to testing errors (13/25), but in a third, opportunities were missed for detection of the error later in the process. In 8/25 the BMS missed requests for specific requirements at sample receipt and registration which led to an incorrect component being issued. There were 2 due to an error in component selection and in the remaining 2/25, there was 1 where the BMS removed the flag from the patient records that indicated the specific requirements and 1 where the patient's transfusion history was not forwarded onto the receiving hospital transfusion laboratory. Testing errors are discussed in Chapter 9, Summary of Events Originating in the Hospital Transfusion Laboratory.

**Case 13: Patient transfused units of inappropriate phenotype despite LIMS alert**

*Red cells were requested for an elderly female who was known to have had alloantibodies. These were flagged in the computer system noting that the patient must receive D-, C-, Fy(a-) and K negative units. An antibody panel and serological crossmatch were performed. The antibody panel confirmed anti-D and anti-C and a very weak reaction that could have been due to anti-Fy$^a$; but this was not further investigated or identified. The crossmatch appeared compatible; the units were issued and transfused. The units selected and transfused were C-, D negative but the Fy$^a$ status was unknown. The transfused units were investigated and both were found to be Fy(a+). The patient had no ill effects. A flag on the patient record stated the specific requirements. The BMS was confused about the significance of anti-Fy$^a$ believing it to be a crossmatch-compatible antibody not requiring antigen-negative blood.*

This case involved several errors that all occurred in the laboratory and resulted in an incorrectly phenotyped unit being selected and transfused to the patient. The initial error was not heeding patient history at sample receipt and registration. Weak reactions identified in the antibody panel were not investigated and there was a lack of basic knowledge from the BMS about a clinically significant antibody.

## Blood warmers n=5

There were 5 cases where a blood warmer was not used in a routine transfusion for patients with cold agglutinin disease.

**Case 14: Blood warmer not used despite clear prescription**

*A patient with cold agglutinin disease and Hb of 67g/L was prescribed red cells. The prescription stated that a blood warmer was required. The nursing staff did not adhere to/notice this requirement and administered the blood without a blood warmer. This was noticed by the patient's consultant on review towards completion of the second unit.*

## Near miss SRNM cases n=72

The near miss incidents relating to patients' specific requirements show similar learning points to the full incidents described above, which led to a transfusion of components where specific requirements were not met.

Table 8.7: Near misses that could have led to IBCT-SRNM n=72

| Point in the process | Type of error made | Number of cases | Percentage of cases |
|---|---|---|---|
| Request | Irradiated | 15 | 22.2% |
| | CMV negative | 1 | |
| Sample receipt | Failure to notice request for irradiated | 7 | 9.7% |
| Testing | Incomplete testing prior to issue | 8 | 12.5% |
| | Transcription | 1 | |
| Component selection | Failure to issue irradiated | 20 | 55.6% |
| | Failure to issue red cell phenotyped | 12 | |
| | Failure to issue CMV negative | 4 | |
| | Failure to issue HLA-matched | 3 | |
| | Incorrect component type | 1 | |
| **Total** | | **72** | **100%** |

## IT-related SRNM cases n=117

There were 117 SRNM cases that also had an IT element and these are described below. The numbers are included in tables above where appropriate, so these are not additional cases. There were 81 clinical errors, and 36 laboratory errors.

### Use of the historical computer record (n=5 laboratory and n=5 clinical)

There were three laboratory cases where the historical record was not consulted, or not linked to the current record, when selecting suitable red cells for transfusion. This resulted in the issue of non-irradiated blood to two patients and antigen-positive blood to patients with red cell antibodies, one of whom had sickle cell disease.

There were four clinical cases where irradiated blood components should have been provided. On two occasions, records were not linked because of different hospital numbers and on one occasion the flag was not transferred from a legacy system to the current LIMS. A neonate was not given irradiated blood following an intrauterine transfusion (IUT) because the information in the mother's record was not linked to that of the neonate. A patient with HLA antibodies was not supplied with HLA-selected components because two hospitals' LIMS systems were not linked. In these cases IT flags could have prevented the omission of special requirements but the primary fault was the lack of information provided to the laboratory by the clinical area.

### Warning flags not in place, not heeded or not used (n=30 laboratory, n=76 clinical)

There were 11 cases where a warning flag was in place on the LIMS but was not heeded. This resulted in 2/11 patients not getting irradiated components, 2/11 not getting methylene blue-treated (MB) or virally-inactivated plasma components and 7/11 patients who did not receive appropriate antigen-negative blood.

In a further 12 cases a warning flag was not activated, or updated with current information. This resulted in the issue of two wrong blood components and one issue of non-irradiated red cells. In 6 cases antigen-negative requirements were not met and 2 patients with positive direct antiglobulin tests (DAT) were not highlighted as unsuitable for electronic issue (EI) according to local policy. One patient was not given HLA-matched components because the HLA antibody report had not been entered into the LIMS.

There were 7 cases where flags were not used. Four patients were transfused non MB (or non virally-inactivated) plasma because the age-specific flag for this component was not in use. A neonate was supplied with adult platelets which did not meet the CMV negative specification for this age group. A patient with sickle cell disease was not given extended matched and HbS-negative blood because the diagnosis was not flagged and another patient was not flagged as unsuitable for EI.

**Case 15: Failure to provide irradiated blood because the warning flag was not set on LIMS**

*The request form for a newly diagnosed patient with acute leukaemia clearly documented the need for irradiated components but the on-call BMS did not have the authority to put a flag on the LIMS and forgot to handover to the senior BMS the following day. As a result, non-irradiated components were supplied on more than one occasion until this was picked up when a further request came to the laboratory.*

In 74 of the 76 patients who did not receive the correct specific requirement for primarily clinical reasons, a large number of cases (68) occurred because the laboratory was not informed of the specific requirement and therefore could not set up a warning flag. The majority (64/68) received non-irradiated components, three should have had antigen-negative blood and one CMV negative components. In four cases there was miscommunication between the ward and the laboratory and the flag was not updated correctly so non-irradiated components were given. On one occasion a flag stating irradiated components were required was not heeded and on another occasion human platelet antigen (HPA) selected components were not provided despite a warning flag.

**Case 16: Failure to check the notes or the LIMS to confirm special requirements**

*A doctor requested HLA-matched platelets out-of-hours for a patient on the basis of verbal information given by a nurse but did not check the notes. The laboratory BMS requested HLA-matched platelets from the Blood Service without checking the LIMS. These were issued without checking the LIMS. The patient had a mild reaction to the platelets, which should have been HPA-1a negative, not HLA-selected.*

**Case 17: Removal of a flag on the LIMS leads to antigen-positive units being transfused to a patient**

*A BMS inadvertently removed a specific requirements flag indicating the patient required C negative red cells, therefore the BMS who issued the blood was not aware of this requirement. The patient was consequently transfused two units of red cells that were C positive.*

## Learning point

- Computers can support the provision by laboratories of the right blood component and correct specific requirements but effective communication between laboratories and clinicians is still essential. Patient records should be accurately linked and merged, and updated in a timely way

### Scanning errors n=1 (n=1 in the laboratory)

There was one error related to the scanning of barcoded information on the blood component bag.

The scanning error resulted in a unit being booked in as K negative when in fact it was K positive and transfused to a female child in error.

## Learning point

- Transfer of information using barcodes is quick and accurate but incorrect use of barcodes can lead to errors

### Inappropriate use of electronic issue

In 6 of the IT cases already described above, blood was issued electronically but criteria for EI were not met.

There were two errors where manual editing of the ABO/RhD group had taken place but EI was still possible. It is more robust if manual editing prevents EI without the need for a flag to be set manually.

There were cases with no current antibody screen (n=1) and a positive antibody screen (n=1) where EI was not prevented. There were two further cases with a positive DAT where local policy excluded these from EI but again, this was not prevented.

There were 2 cases where there was a discrepancy between the patient ID on the historical and current LIMS record (date of birth in one and name in the other) that meant that EI should have been prevented but was not.

## Learning points

- Electronic issue (EI) should be under the control of the laboratory information management system (LIMS) with no manual interventions and logic rules and flags should be set up to support this
- EI must be prevented if the criteria are not met and these algorithms should be tested to ensure they are robust and corrected when errors are identified

Recommendations still active from previous years are available in the 2013 Annual SHOT Report Supplement located on the SHOT website, www.shotuk.org under SHOT Annual Reports and Summaries, Report, Summary and Supplement 2013.

# Incorrect Blood Component Transfused: Serial Errors and Multiple Missed Opportunities to Detect an Earlier Error

The transfusion process is a series of interlinked steps which require laboratory and clinical staff to work together. Safe transfusion practice depends on every step being carried out correctly and staff should not assume that or rely on previous steps having been completed properly. Correct patient identification is an integral part of each step with particular emphasis on positive patient identification at the two key stages indicated in Figure 8.1. Positive patient identification is the use of open ended questioning ('What is your name? What is your date of birth?') to verify the patient's 4 unique identifiers (first and last name, date of birth, unique identification number, gender in Scotland and first line of the address in Wales) whilst checking against the patient identity band and the relevant documentation [23].

## A review of errors resulting in incorrect blood components transfused and missed opportunities for detection n=547 (220 reports)

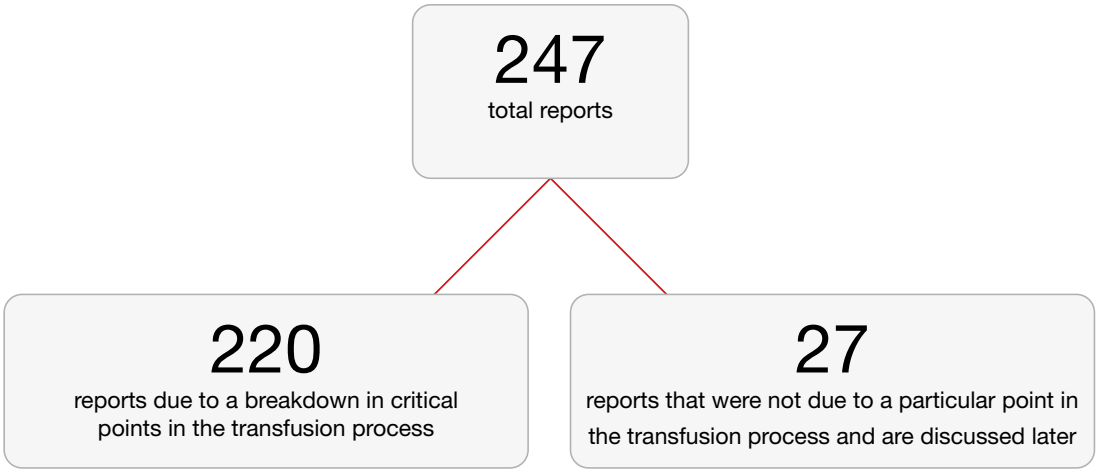



**Figure 8.4: Number of reports due to failure of correct steps in the transfusion process**

Figure 8.5 illustrates the number of cases that were analysed and the number of missed opportunities to detect an error (e.g. if a case has 3 missed opportunities, this means that there were 2 subsequent opportunities for the initial error to be detected).

The steps where errors are most likely to occur are shown in Table 8.8, but the opportunity to detect these is maximal at the time of checking against the prescription and before administration (Figure 8.6).

### Learning point

- The process of checking each component against the prescription and patient identity before administration are key points when earlier errors could be detected and so prevent administration of a wrong component or one not suitable for that patient's specific requirements

**Figure 8.5:** Number of steps where there was a critical point breakdown in the transfusion process n=220 reports

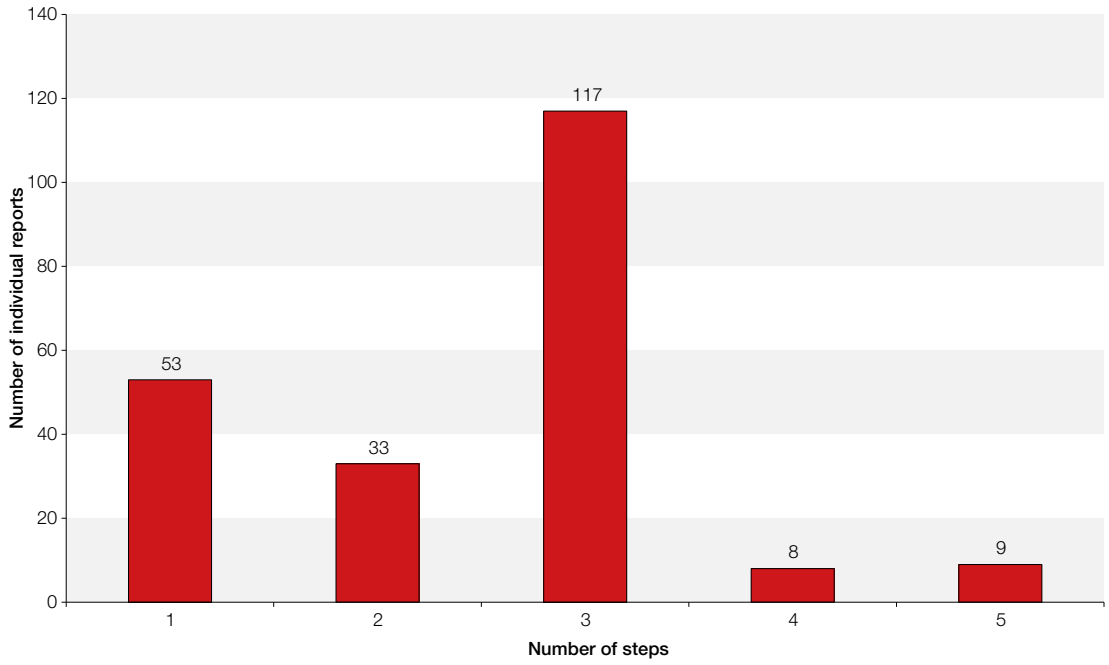
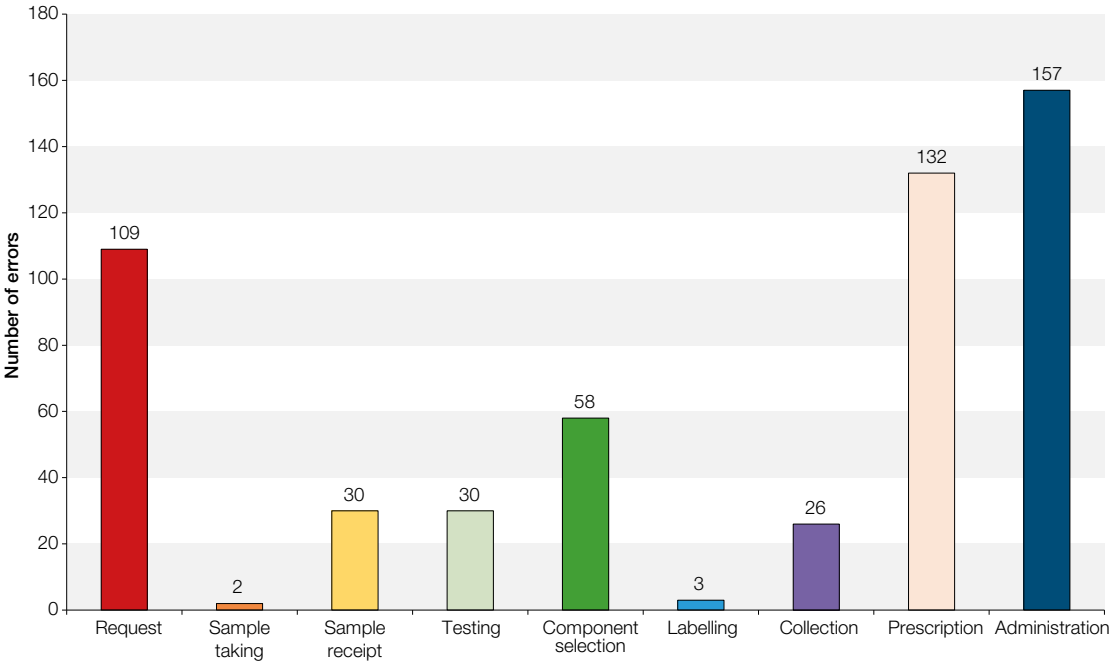



**Figure 8.6:** Steps in the process where an error was made or an opportunity was missed to detect the primary error n=547




SHOT has noted in the past that many incident reports are compounded by more than one error. In some cases, 31/220 (14.1%), errors could have been detected in both laboratory and clinical areas. Many primary errors, 155/220 (70.5%), could have been detected at the final pre-administration checks at the bedside. It is crucial that this step is done properly.

| Step in the transfusion process | Number of reports by step of primary error | Missed opportunities to detect the primary error | Total steps in the process where an error was made or an opportunity was missed to detect the primary error |
|---|---|---|---|
| Request | 109 | 0 | 109 |
| Sample taking | 1 | 1 | 2 |
| Sample receipt | 20 | 10 | 30 |
| Testing | 28 | 2 | 30 |
| Component selection | 28 | 30 | 58 |
| Labelling | 2 | 1 | 3 |
| Collection | 23 | 3 | 26 |
| Prescription | 7 | 125 | 132 |
| Administration | 2 | 155 | 157 |
| **Total** | **220** | **327** | **547** |

**Table 8.8: Comparison of primary error and missed opportunities for detection**

The request is the first step in the transfusion process. It is the clinician's responsibility to inform the transfusion laboratory of patients whose clinical condition requires components of a particular specification.

**Case 18: Failure to provide units of appropriate specification due to poor communication**

*A pregnant woman (gestation 36/40) was admitted to the delivery ward with chronic anaemia and received two units of red cells at that were not CMV negative. Clinical details on the request form stated 'Low Hb prior to delivery' but no estimated date of delivery was recorded. Laboratory staff would expect that a patient in the delivery suite was giving birth unless told otherwise. Routine practice is to use non-irradiated components at delivery so 2 random CMV status units of red cells were issued.*

## Learning points

- Clinical staff should provide full information to laboratory staff with regard to specific requirements
- Age and gender-related specific requirements are a laboratory responsibility. Laboratory information technology (IT) systems should be used to their full potential to prompt staff about specific requirements either through logic rules or algorithms based on date of birth and/or gender, or by warning flags. If this is not possible with the existing system then these development requirements must be raised with the laboratory information management system (LIMS) supplier

## Missed opportunities to detect the primary error

Multiple errors in the transfusion process are common (the median number is 3 – Figure 8.5). How and where can they be detected?

### Five steps – Cases where there were 4 opportunities to detect the primary error n=9

There were 9 cases where the primary error in the request was followed by 4 further missed opportunities to detect the error. All 9 cases were instances resulting in specific requirements not being met where there was the same combination of primary error and opportunities for detection:

Request, sample receipt, component selection, prescription and administration.

**Case 19: Failure to add the need for irradiated components to the request form leads to specific requirements not being met**

*A pharmacy list is updated monthly for patients who have been started on drugs that require a patient to have irradiated components. The list was e-mailed to the transfusion laboratory nine days into the next month. A renal transplant patient was on the list but the laboratory had not been informed in time. The patient had already been transfused non-irradiated red cells on three occasions. The*

*request form for the second transfusion had been marked for irradiated components but had not been noticed by the BMS and the flag was not on the computer to alert them.*

**1 Primary error: Request** – Specific requirements were not documented on the 1st request form so the transfusion laboratory were not informed of the need for irradiated components.

**2: Sample receipt** – The need for irradiated components had been noted on the 2nd request form but the BMS had failed to notice it.

**3: Component selection** – Irradiated units were not selected.

**4: Prescription** – Specific requirements for irradiation were not indicated on the prescription chart/not followed as required.

**5: Administration** – Need for irradiated components was not noted at the bedside check and non-irradiated components were transfused.

There may have been a misconception that the laboratory staff would be alerted by the pharmacy notification and it was therefore not necessary to follow this up with a formal request. This case illustrates the need for effective communication and the importance of each individual's role within the team involved in the care of the patient from both a clinical and laboratory perspective.

## Learning point

- Pharmacy notifications are a useful back up to ensure the laboratory know about patients who have been receiving treatment that requires provision of irradiated components. However, these systems should be used to support the information supplied on the blood request form and not relied upon as the sole communication to the laboratory as they are often not delivered until after transfusion support has started

### Four steps – Cases with 3 opportunities to detect the primary error n=8

In 8/220 (3.6%) reports the patient's specific requirements were missed at 4 steps. In 7/8 cases the primary error occurred in the laboratory.

**Case 20: Failure to heed request for irradiated units results in a patient receiving non-irradiated units despite 3 opportunities to detect the error**

*The 'irradiated red cells' box was ticked on the request form. This was missed by both the medical laboratory assistant (MLA) booking in the request and the BMS issuing the blood component and later not noticed by the clinical staff. This resulted in the transfusion of one unit of non-irradiated red cells to a patient on fludarabine.*

**1 Primary error: Sample receipt and registration** – The need for irradiated red cells was indicated on the request form. This was missed at booking in the sample.

**2: Component selection** – It was then missed again when the BMS issuing the component did not notice the ticked box for irradiation on the request form either.

**3: Prescription** – Another opportunity was missed at the time of transfusion when nursing staff did not check for specific requirements on the prescription.

**4: Administration** – The need for irradiated components was not noted at the bedside check and a non-irradiated component was administered.

The consultant haematologist had not informed the transfusion laboratory about this specific requirement on a previous occasion.

## Three steps – Cases with 2 opportunities to detect the primary error n=117

This was the largest group, 53.2% (117/220). Most result from errors in requesting which were not then detected at prescription or administration. Most of these resulted in specific requirements not being met.

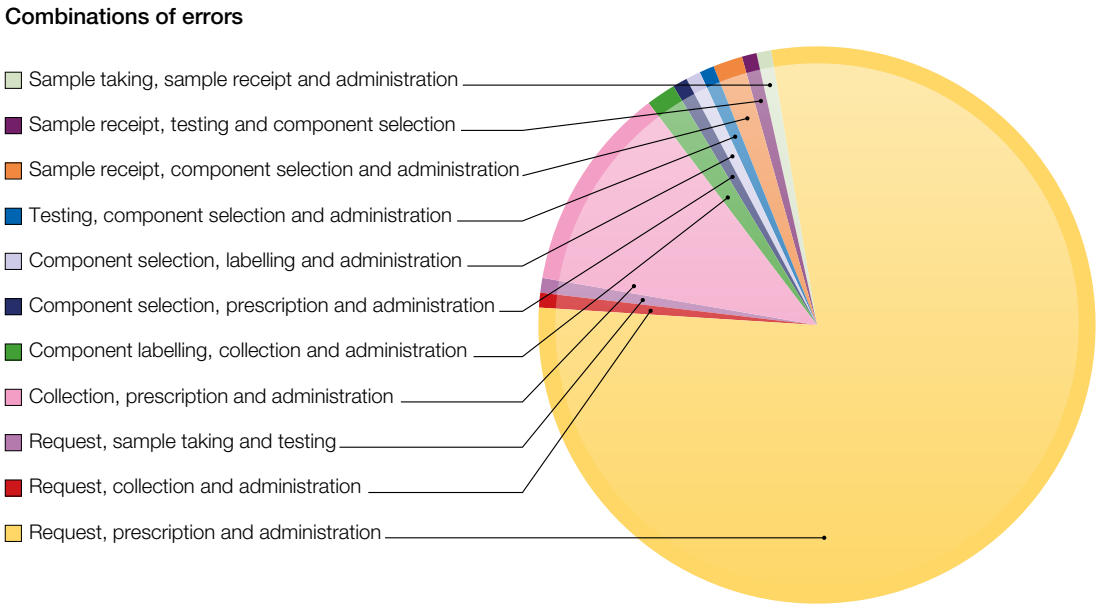



**Figure 8.7: Combinations of primary error and opportunities for detection – 3 steps n=117**

The slices show the different combinations of opportunities to find the errors and demonstrate that 'request, prescription and administration' is the most common combination of 3 steps (primary error and 2 missed opportunities to detect the primary error) n=92/117 (78.6%).

**Case 21: Haematology registrar overlooks the need for irradiated components**

*When completing the blood transfusion special requirements notification form the haematology registrar circled 'No' in response to the question 'Does this patient require irradiated components?' even though the patient had been on fludarabine in 2010. Non-irradiated platelets were issued to the patient.*

**1 Primary error: Request** – The doctor failed to identify the need for irradiated components on the request form despite the history of fludarabine treatment.

**2: Prescription** – The person authorising the components also failed to note this on the prescription chart.

**3: Administration** – Not picked up at the final bedside check.

Failures to authorise/adhere to a prescription and the subsequent administration of an incorrect component are two individual steps where an earlier error could have been detected. In this group there were 13 instances of wrong component transfused and 99 of specific requirements not met. Staff in particular areas such as haematology should have a better working knowledge of the indications for specific requirements and ensure that these are communicated to the laboratory. The needs of these patients are more likely to be overlooked when cared for in another clinical area or hospital.

## Learning point

- Patients with specific transfusion requirements may be treated anywhere within the health service including different departments in a hospital, different hospitals or in the community. All staff caring for a patient requiring transfusion have responsibility for knowing what constitutes specific requirements. Staff in haematology departments in particular should be adequately trained to know when these are indicated

**Case 22: Miscommunication and assumption leads to incorrect transfusion**

*The ambulance service contacted the emergency department (ED) about a patient being brought in following an accident. She was assigned the name 'Delta Red'. The patient was unstable, with suspected intra-abdominal injuries and required activation of the major haemorrhage protocol ('code red'). Another unidentified patient from the same accident had also been brought to the ED and assigned the name 'Charlie Red'. This patient arrived first and blood samples were sent to the laboratory.*

**1 Primary error: Request** – When the transfusion laboratory received the 'code red' call from the ED, the caller did not pass on patient details before ending the call. As the staff member in the transfusion laboratory had, at that point, received samples for 'Charlie Red' she assumed the call was for this patient and issued the pre-thawed FFP to this patient.

**2: Collection** – The FFP was collected by the porter even though it was for the wrong patient (perhaps he was not given sufficient patient ID information).

**3: Administration** – These units were subsequently transfused to 'Delta Red' despite being issued for 'Charlie Red'. One unit of FFP was given in the resuscitation area and a further unit of FFP was given in the radiology department. Various members of staff checked the blood components. The serial numbers on the units of FFP were checked against the serial numbers on the tags; however the patient name on the FFP was not checked against the patient wristband. On return from radiology a further unit of FFP was checked at which point the team became aware that the FFP was labelled 'Charlie Red'.

There were at least 3 points where a wrong transfusion could have been prevented but each person made assumptions about the preceding step. There has to be an element of trust in these situations but this must not override clear communication and basic checking.

## Learning points

- Safe transfusion is dependent on teamwork with good communication and an appreciation of each person's roles and responsibilities
- Communication between staff and other departments must be clear at all times but especially in emergency situations. Poor communication can lead to errors

**Two steps – Cases with 1 additional opportunity to detect the primary error n=33**

There were 33 cases where the primary error could have been detected at a second point in the process.

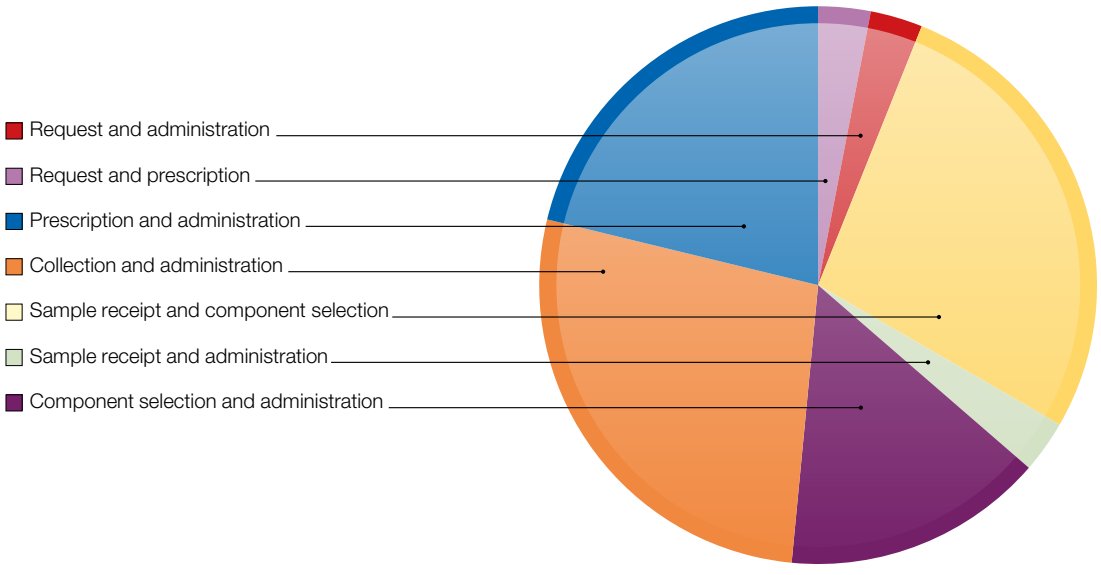



**Figure 8.8: Combinations of primary error and opportunities for detection, 2 steps n=33**

**Case 23: A patient known to have anti-C was transfused with units of blood which were C positive**

*A known patient with a computer alert noting the need for C negative, and E negative red cells was issued three units of blood which were all C positive. The patient received the whole of the first unit and two thirds of the second before the error was detected. The second unit was stopped and the third was not transfused. The patient was admitted in order to monitor for signs of a delayed transfusion reaction.*

**1 Primary error: Sample receipt and registration** – The BMS failed to heed patient historical records and the computer alert flagging the requirement for C negative, E negative red cells.

**2: Component selection** – Suitable units had already been put to one side for this patient and there was documentation in the laboratory for the shift handover. However, the units were not found and instead C positive units were selected from stock.

## Learning point

- Handover templates should be improved to provide information about diagnosis, irregular antibodies and specific requirements. Patients are vulnerable particularly between shifts in the laboratory as well as in the clinical areas

### Single opportunity to prevent a wrong transfusion n=53

In 53/220 (24.1%) reports, a single error was made. These occurred at several different stages in the process: the request, testing, component selection, and administration. However, laboratory errors were responsible for 48/53 (90.6%) of these cases. All laboratory errors are discussed in more detail in Chapter 9 Summary of Events Originating in the Hospital Transfusion Laboratory.

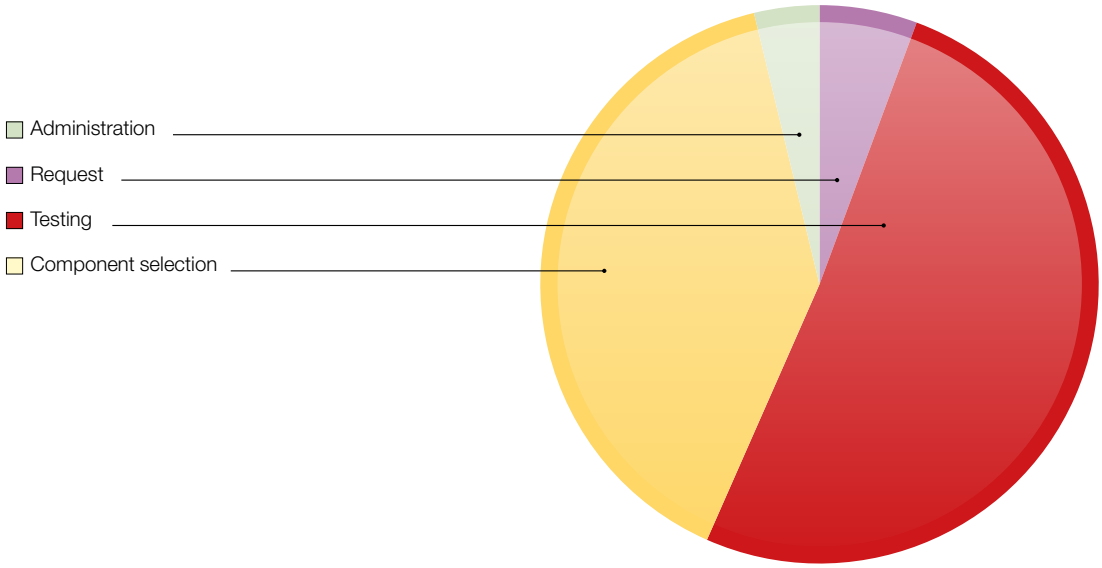



**Figure 8.9: Primary errors where there were no further opportunities for detection, 1 step n=53**

**Case 24: A patient receives transfusion prior to testing being completed**

*Two units of blood were collected and the transfusion started for a patient before the immediate spin grouping results were read. The immediate spin tubes were found in the centrifuge by another BMS and read retrospectively. The patient was group A, and the units transfused were also group A, but this was not confirmed by reading the immediate spin crossmatch before the transfusion began. Additionally it transpired that the results of the current group (historical group on file) and negative antibody screen results had been transmitted to the patient file but not authorised prior to collection of the first unit.*

**1 Primary error: Testing** – The components were issued prior to completion of testing

## Other cases where errors occurred outside the steps of the transfusion process n=27

### Communication failures n=9

In 9/247 instances errors occurred as a result of communication failures from sources outside the reporting hospital. Examples include shared care patients where important information about the patient's medical history and treatment was not communicated to the clinical and laboratory teams at the receiving hospital.

### Conflicts in professional practice n=16

In 16 cases there were differences in professional practice between hospitals. Irradiated components are recommended for any patient who receives alemtuzumab (anti CD52, a marker for mature B-lymphocytes). This was risk-assessed and considered unnecessary at the transplant unit. However, the local hospital where the majority of the patients' care took place followed product and current national guidelines which state that patients treated with alemtuzumab should receive irradiated blood components for life [28].

These cases are discussed in more detail in Chapter 27 Summary of Incidents Related to Transplant Cases.

### Miscellaneous cases n=2

There were 2 further cases which could not be categorised in this process. The first of these is discussed in the RhD mismatch section where the investigation into the incident could not establish the root cause of the error. In the second case a BMS deleted a flag that informed staff about a specific requirement for a patient who required irradiated components.

## COMMENTARY

In 155/220 (70.5%) of cases, the errors could have been detected at the final pre-administration check at the patient's side, but this is increasingly difficult with fragmentation of medical care so that doctors in different teams are likely to be involved and they may not know the patient's specific requirements. Effective communication and a solid foundation of transfusion knowledge, including patient specific requirements, are necessary for all staff involved in the transfusion process.

## Recommendation

- The majority of episodes resulting in an incorrect component transfusion result from multiple errors in the multidisciplinary transfusion process. All professional staff participating in transfusion must perform independent and careful checks. A simple 5-point aide memoire at the final step would remind staff to check for the correct patient identifiers, and the prescription for the correct component and confirmation of specific requirements

**Action: Hospital Transfusion Teams**