



INTEGRATED PATHOLOGY SERVICE BLOOD TRANSFUSION DOCUMENT

Blood Administration Workbook

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**South East Coast Regional Transfusion
Committee**

**Receiving and Administering
A Blood Component
3rd Edition**



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About the Authors

Simon and Ruth have enjoyed their writing partnership through the 1st and 2nd editions (2008 and 2013). Despite the now great distance, both were delighted to collaborate together again on this 3rd edition and to carry on the process of continual improvement.

Simon Goodwin is a UK Registered Nurse, he enjoyed 12½ years in clinical haematology before taking up post as Specialist Practitioner in Transfusion at Surrey and Sussex Healthcare NHS Trust from 2006 -2016. Simon moved to Sydney Australia in 2016 and still works as a transfusion safety specialist.

N.B. THIS WORK IS UNRELATED TO HIS CURRENT ROLE AND IS NOT ENDORSED BY HIS EMPLOYER.

Ruth O'Donnell is a Biomedical Scientist who has worked in Haematology, Cytogenetics (as a clinical scientist) and finally found her "home" in the science of blood transfusion. She feels privileged to work for the NHS and is grateful that her role has allowed her to work with others she admires (both in the UK and the other side of the world!) who share a vision to provide an excellent transfusion service to our patients.

Acknowledgements

The Authors would like to thank:

Katie Stone, Assistant Transfusion Practitioner WSHFT for her reviews and feedback.

Elizabeth Tatam, Specialist Practitioner in Transfusion, Surrey and Sussex Healthcare NHS Trust

Introduction

The purpose of this workbook is to provide you with a thorough understanding of the *CRITICAL* steps that underpin safe blood transfusion practice. Applying this knowledge in your clinical practice will enable you to consistently maintain the highest standards of transfusion practice regardless of clinical pressures.

This 3rd edition builds on the success of the previous workbooks which have facilitated an increase in the standards of practice and clinicians' confidence to maintain the care that our patients deserve.

The authors have always welcomed learner feedback and we hope this process of continual improvement will ensure that completing this workbook is enjoyable and embeds solid understanding of the rationale behind the safe practice steps.

It is important that you work through the book independently. You may wish to discuss the learning points with your colleagues but you must ensure that you understand the answers you submit. Your Trust's Transfusion Practitioner will be very willing to provide guidance. The pass mark is 90%: however there are some questions that if answered incorrectly will trigger a red flag and instant failure of the workbook.

In practice you have to get it right 100% of the time.



Patient Blood Management (PBM)

Although this workbook focuses on the safe administration and care of a patient receiving a blood component: transfusion practice must now be viewed in the wider context of Patient Blood Management (PBM).

PBM is an international initiative for an evidence-based, multidisciplinary approach to optimise the 'blood management' for patients. The fundamental strategy of PBM is based on treating each patient as an individual with individual needs. Thorough continuous clinical assessment is essential for successful blood management, and as we know, has always been essential to optimise patient outcomes.

PBM represents a better understanding of the balance between the risks and benefits of blood transfusion. International evidence has increasingly demonstrated that unnecessary transfusions can lead to increased rates of infection, length of stay and other complications associated with increased morbidity and mortality.

PBM is based on 3 pillars:

Pillar One: Optimise Red Cell Mass

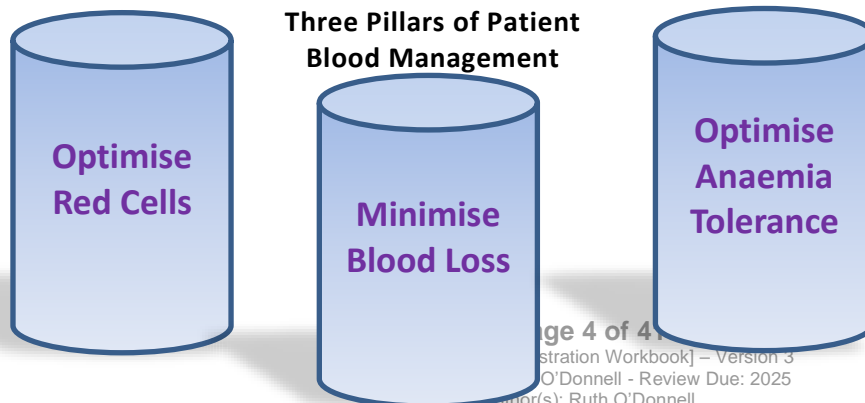
Assessments may include haematinics; treatment may include replacement of Iron, B12, or Folate.

Pillar Two: Minimise Blood Loss

The source of bleeding may or may not be clearly evident, it may be chronic or acute. Treatment may include medication, endoscopy and/or invasive surgery. Within surgery specific blood conservation methods such as cell salvage and the use of antifibrinolytics should be employed where appropriate.

Pillar Three: Optimise Anaemia Tolerance

This is about treating the patient and not the blood result. Toleration of anaemia depends upon several factors including the severity, aetiology, co-morbidities (e.g. cardiac or respiratory) and other pathological, psychosocial and personal circumstances of the patient.



PBM was formally adopted into UK clinical practice in late 2015 and compliance against the recommendations is incorporated into an organisation's accreditation process.

Examples of PBM becoming embedded into clinical practice include:

- Where red cell transfusion is deemed beneficial; a single unit is now considered the 'standard dose' (except for major haemorrhage and patients on chronic transfusion programs).
- Work around improved consent to blood transfusion and ensuring that patients have access to information to make informed decisions.
- Optimising Haemoglobin (Hb) levels before elective surgery.
- Using antifibrinolytics such as tranexamic acid for major bleeding.
- Correcting the underlying cause of anaemia before considering transfusion, wherever possible.

Q1 Give 2 examples of how you can promote PBM in your role?

(2)

Q2 List 2 outcomes that unnecessary transfusions can lead to

(2)

Q3 Give two examples of PBM embedded into clinical practice.

(2)

Legislation and National Safety Drivers

Blood Safety and Quality Regulations (BSQR) 2005

These regulations set the statutory requirements for quality and safety for the collection, testing, processing, storage and distribution of human blood and blood components. The regulations stipulate that all healthcare providers who handle blood components must be monitored by the 'competent authority': the Medicines & Healthcare products Regulatory Agency (MHRA). The MHRA inspect hospital transfusion laboratories to ensure their processes and quality standards comply with the BSQR.

What Do the Regulations Mean to Clinical Staff?

It is a statutory requirement to:

- Trace every blood component from donor to recipient and keep records for 30 years.
- Prove traceability (final fate) of every unit. The responsibility for this lies with the person administering the blood.
- Report any adverse events or reactions to the competent authority. The online reporting mechanism is known as Serious Adverse Blood Reactions and Events (SABRE). Usually this is done by the transfusion lab or Transfusion Practitioner.
- Comply with the correct storage requirements for blood components; any units that will not be transfused within 30 minutes must be returned to controlled storage.
- Have documented evidence of up-to-date training and competency assessment before you can collect blood components.
- Ensure full documentation for every single blood component transfused, including: Transfusion Laboratory Register, Blood Authorisation (Prescription) Chart, Observation Chart, Nursing and Medical Notes.

NB. *Documentation may be paper or electronic.*

National Safety Initiatives

There are several national bodies that collectively drive safety in transfusion and improved patient care; a brief summary of the most prominent follows:

Care Quality Commission (CQC). As a part of their overall role in ensuring high standards of patient safety and quality of care, the CQC scrutinize healthcare providers' performance in relation to blood transfusion.

National Blood Transfusion Committee (NBTC). The NBTC promotes good transfusion practice by providing information and advice to hospitals and blood services. The structure of NBTC, Regional and Hospital Transfusion Committees enables two way communication so that all healthcare staff can put forward ideas or raise concerns about transfusion.

Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO). SaBTO advises UK ministers and health departments on the most appropriate ways to ensure the safety of blood, cells, tissues and organs for transfusion/transplantation.

British Society for Haematology (BSH). BSH produce evidence-based guidelines written by expert consultants and clinical scientists currently practicing in the UK; healthcare providers use these to derive their local transfusion policies.

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National Institute For Health and Care Excellence (NICE). In 2015 NICE produced important evidence-based guidance for transfusion, which stipulates the expected assessment and management of blood transfusions in adults and children over 1 year old. The guidance covers general principles of transfusion, but doesn't make recommendations relating to specific conditions.

Haemovigilance

Haemovigilance is the surveillance procedures covering the whole transfusion chain, from collection of blood from donors to follow-up of recipients. It collects and assesses information on unexpected or undesirable effects of transfusion with the aim of preventing them. (*International Haemovigilance Network [IHN], 2012*). Under the BSQR 2005 there is a statutory requirement to report serious adverse reactions and events to the MHRA through SABRE. **Serious Hazards of Transfusion (SHOT)** is the UK independent, haemovigilance scheme. SHOT produces recommendations to improve patient safety in annual report.

SHOT and the MHRA work closely reporting system for transfusion reactions called **Serious Adverse and Events (SABRE)**. Reports to completed by Transfusion Lab Transfusion Practitioners. Reports completed after a thorough investigation and all factors surrounding the event have been considered.



and have a joint related events and **Blood Reactions** SABRE are Scientists or can only be

Should an adverse event occur to one of your patients, the first step is to ensure patient safety by following your organisation's policy for managing adverse transfusion events; this will include liaising with transfusion laboratory Biomedical Scientists (BMS) so that they can assist in the investigation. Once the patient is safe, the incident must be recorded via your local incident reporting system.

Q4 List 4 of the requirements that the Blood Safety And Quality Regulations expect of clinical staff



(4)


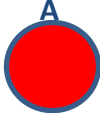
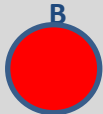
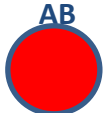
Q5 How would you report a serious blood transfusion event that occurred in your clinical area? Who would report it to SHOT or SABRE?

(2)

Blood Groups

SHOT recommend that clinical staff involved in the transfusion process receive training and assessment in ABO and D blood group systems. Although there are hundreds of different blood groups, the 4 groups of the ABO blood group system are the most important in transfusion (*Table 1*).

(Table 1)

ABO Group	AB Antigens on Red Cells	Antibodies in plasma (naturally occurring)	Did you know?
O	none 	Anti-A, Anti-B	Group O is the most common blood group in the UK (~44%) Group O Patients can only be transfused group O red cells. Group O red cell donations are compatible with all other ABO groups.
A	A 	Anti-B	Group A is the 2 nd largest blood group in the UK (~39%) Group A platelet donations are always in high demand as they can be given to patients from all ABO groups.
B	B 	Anti-A	Group B is more common within the South Asian (20%) & Black communities (25%) than in White European communities (~10%)
AB	AB 	Neither Anti-A or Anti-B	AB is the rarest ABO group (~3%) AB red cells can only be given to AB patients. However , AB plasma can be used to treat patients of all ABO groups

*percentage figures from NHSBT data <https://www.blood.co.uk/why-giveblood/the-need-for-blood/know-your-blood-group/>

The D Group (Part of the Rh blood Group System)

In red cell transfusion D is the most important group (or antigen) of the Rh blood group system (formerly known as Rhesus).

Red cells that express the D antigen are called D positive (also D pos, D+ or RhD positive). Red cells that don't express the D antigen are called D negative (also D neg, D-, or RhD neg).

O Neg is often called the 'universal donor' but this refers to red cells only, not plasma or platelets

D negative patients can develop Anti-D in response to previous exposure to D positive red cells either by transfusion or pregnancy. (This is why prophylactic anti D is administered to non-sensitised D neg pregnant woman.) In an emergency anyone who is unlikely to fall pregnant (women over 50 years, or men) may receive D pos red cells however these patients may have an acute haemolytic reaction to a D positive red cell transfusion if previously exposed.

Q6 Your patient is group B. What ABO group red cells can they safely receive?



(2)

Q7 In an emergency where the patient's blood group is not yet known, what ABO group of platelets is safest to give?

(1)

Q8 Can a D neg patient have an immediate haemolytic reaction if they were to receive D pos blood? – Explain your answer

(2)



Step 1: Indication for Transfusion

Transfusing blood components can accurately be described as a human tissue transplant: clearly then it is not a decision that should be taken lightly.

The benefits versus the risks of transfusion must be weighed up for every single blood component. Blood test results should only inform part of the decision making process, **equally if not more important**, is thorough patient clinical assessment.

Two patients can have the same Hb, yet it may be appropriate to transfuse one but not the other. Several factors must be considered, e.g. the underlying cause of the anaemia, overall fitness and health, and co-morbidities.

A patient's underlying disease process, and sometimes medical treatment, is the cause of a deficit in their Full Blood Count (FBC) indices or clotting screen. Thus transfusing blood components only addresses the symptoms and not the cause(s). Additionally any alternative or supplementary approaches to transfusion should be considered before deciding to transfuse blood components with their associated risks.

Q9 Give two factors that should be considered before deciding to transfuse blood components to a patient

(2)

Table 2.

NICE 2015 Recommendations: Red Cell Transfusion		
NOT ACTIVELY BLEEDING:	THRESHOLD	TARGET
General	70g/L	70-90g/L
Acute Coronary Syndrome (ACS)	80g/L	80-100g/L
Chronic Transfusion Program	Set by individual patient experience	
Adult: Symptomatic of Anaemia	Single Unit Transfusion	Clinically reassess, repeat Hb: ONLY GIVE FURTHER UNITS IF NEEDED.
Child or Low Body Weight: Symptomatic of Anaemia	Calculated Equivalent Volume	

Q10 A patient with a Hb of 60g/L who is not bleeding and doesn't have ACS. After assessment, due to symptomatic anaemia, a red cell transfusion is considered appropriate. What target Hb does NICE recommend for them?

(1)

Q11 What is considered the "standard dose" for a non-bleeding patient and what would you expect to be done after transfusion?

(2)

Step 2: Requesting Blood Components

The request for blood components to be issued does not have to be made by the authorising (prescribing) clinician: BSH guidance states that appropriately trained, competent and locally designated registered regulated healthcare practitioners may request blood components.

When requesting blood components it is vital to state the indication for the request, and of course the request form (electronic or handwritten) and blood sample must be **legible** and have accurate patient core identifiers (FIRST NAME, SURNAME, DOB AND UNIQUE IDENTIFICATION NUMBER).

BSH guidance, supported by the MHRA and SHOT, also states that transfusion laboratories should have zero tolerance for wrongly or insufficiently labeled forms and/or blood samples because:

INCORRECT PATIENT IDENTIFICATION CAN LEAD TO ABO INCOMPATIBLE TRANSFUSION WHICH MAY BE FATAL

Without a 'Zero Tolerance' policy, the clinical incentive to follow procedure and correctly identify the patient **every time** is compromised.

Requesting blood components is a *CRITICAL* step. Your Trust's transfusion policy will state what information must be provided when requesting blood components.

Safe practice responsibilities include:

- Clinicians: to clearly communicate specific transfusion requirements.
- Transfusion Scientists: to issue suitable blood components

Q12 What would happen if you sent an incorrectly labeled blood sample to your transfusion laboratory and why should this happen?

What would happen to the sample?

Why?

(2)

Step 3: Preparing a Patient for a Transfusion

Patient Consent

The Supreme Court decision in *Montgomery v Lanarkshire Health Board* (2015) represents significant change in legislation on patient consent. Healthcare professionals (HCPs) have a duty to provide patients with accurate and current information about proposed treatments. It is expected that there should be a collaborative approach to consent. **Wherever possible valid consent should be obtained and documented together with the indication for transfusion in the patient's clinical notes.**

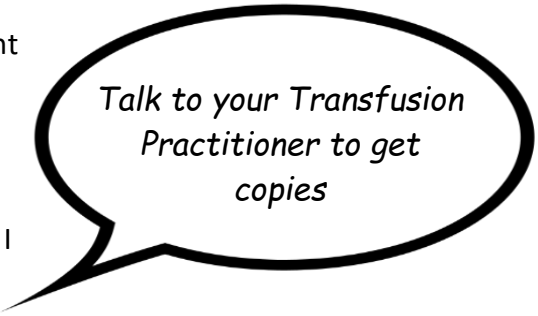
SaBTO released guidance in 2011 that states HCPs should, whenever possible, ensure that the patient knows:

- why the transfusion is indicated
- the benefits, the risks and possible alternatives

- that they can no longer be a blood donor.

Any questions or concerns the patient has should be addressed and the indication and verbal consent must be documented in the notes.

The National Blood Service (NHSBT) produce excellent patient information leaflets. Where possible, every patient who is to be transfused should be offered a leaflet; there are exceptions in emergencies or where the patient lacks capacity at the time of the decision to transfuse. The main leaflet is called "Will I need a Blood Transfusion?" but there are several others.



Talk to your Transfusion
Practitioner to get
copies

Q13 According to SaBTO recommendations what 3 things should the patient know about their transfusion?

(3)

The following guidance is based on the 'Consent to Blood Transfusion' pad developed by the South East Coast Regional Transfusion Committee (and now a national NHSBT resource).

This was designed to make gaining verbal consent to blood transfusion simple, manageable and consistent. *Table 3* shows how all the risks of blood transfusion can be categorised into 4 main groups and equally important, how these risks can be mitigated.

Using this tool offers key advantages including:

- When explaining the risks to the patient, the HCP is also making a promise to adhere to the safe transfusion practice steps, i.e. that they will follow policy and carry out all mitigating safety actions.
- The patient will be given a consistent message, no matter how many staff the patient may talk to about the planned transfusion. This is important because consent should not be thought of necessarily as one single conversation; questions may occur to the patient at any time and these should be addressed. Considering all 4 categories ensures that in all cases the risks of transfusion is outweighed by the expected benefits.

Q14 What is one of the advantages of categorising all the risks of transfusion into 4 main groups?

(1)

Q15 Why should all risks be considered before components are requested?

(1)

Practical Patient Preparation for a Blood Transfusion

As with any clinical procedure, good preparation will ensure the whole process runs smoothly and safely.

Practical steps include:

- Ensure your patient is aware that the transfusion is to start soon
- Last minute preparation may include: out to toilet, positioning for comfort etc.
- Patient verbal ID, Wristband and Authorisation chart are identical and correct
- Patient has suitable and patent venous access
- Equipment ready at the bedside (including IV pumps if needed)
- Baseline observations - full set with National Early Warning Score (less than 1 hour before the start of transfusion)

Consent for Transfusion

- Explain the risks & benefits, allowing time for questions
- Consider/offer your patient an alternative
- Where possible gain informed consent
- Inform your patient how the risks are mitigated
- Inform them that patients who have received a blood component since 1980 are not eligible to be blood donors
- Give appropriate patient information leaflet(s)

Remember: patients have the right to refuse a transfusion

(use this information to assist the consent process in conjunction with your Trust policy)

Four Risk Categories & Mitigations in Transfusion *Table 3*

Risk:	To mitigate you must:
<p>1. Human/System Error Patient misidentification at CRITICAL steps: Right Patient - Right Blood</p>	<ul style="list-style-type: none"> • If possible, involve your patient, ask them for their full name & date of birth • Check their wristband • Label samples at the patient's side • Check components at the patient's side
<p>2. Transfusion Associated Circulatory Overload (TACO) Higher risk in children, elderly, low body weight, hypertension & cardiac /respiratory/renal impairment</p>	<ul style="list-style-type: none"> • Perform a formal pre-transfusion risk assessment for TACO • Monitor fluid balance. Consider diuretics for those at risk • In non-bleeding adults, consider 1 unit at a time according to body weight • For patients at risk, transfuse slower & monitor observations closely including oxygen saturations • Encourage your patient to report any breathlessness within 24hrs
<p>3. Adverse Immune Response Patients are screened for antibodies to red cells (unless emergency)</p>	<ul style="list-style-type: none"> • Ask for previous transfusion history • Record & review observations • Encourage your patient to report any symptoms. e.g. feeling hot or cold, shaking, pain, itching, rash &/or if something feels wrong
<p>4. Transfusion Transmitted Infection Donations are screened for HIV, hepatitis (B, C & E), HTLV & syphilis. Risk of infection is very low; however, there will always be a small risk</p>	<ul style="list-style-type: none"> • Comply to cold chain • Prepare your patient before collecting a blood component • Adhere to Infection Control Policy, e.g. Intravenous access devices

Q16 Table 3 lists 4 risks of a blood transfusion. The biggest risk is Human/system error. List how you would mitigate this risk?



(4)

Step 4 Collection & Delivery of blood Components



Collecting blood components is a **CRITICAL** step in the blood transfusion process, and is directly covered by the Blood Safety and Quality Regulations 2005.

Blood may only be stored in a designated blood fridge, or in a sealed, validated blood transportation box, because of the risk of bacterial growth.

For these reasons it is a separate competency with a Workbook dedicated to the process for all staff who may collect blood components in a healthcare setting including Porters, Healthcare Assistants and some registered HCPs.

Platelets must be stored 22°C agitated and Fresh Frozen Plasma and Cryoprecipitate is frozen and then thawed before collection. Components stored outside of this designated storage must be reported and not administered.

Q17 Where are the 2 places that red cells are stored before transfusion to a patient?



(2)

Q18 How soon should the transfusion commence from when a blood component is collected from controlled storage conditions?



(1)

Q19 If it has not been possible to commence the transfusion within the time stated above, what action you should take?



(1)

Why?

(1)

Q20 For non-urgent transfusions, how many red cell units should be collected at a time ?

(1)

Step 5: Administering Blood Components

Authorising Blood Components Although historically the word “prescribe” has been used for blood components, and most likely will be for some time, the term “authorise” is gaining momentum. This is partly due to the distinction between a blood component which has been taken from a single or limited number of donors (e.g. Red Cells, FFP, Platelets) and uniformly batched, fractionated plasma products taken from large numbers of donors (e.g. Anti-D, Human Albumin Solution and Prothrombin Complex Concentrates) which are listed in the British National Formulary (BNF).

Authorising blood components remains predominantly a medical responsibility, small numbers of non-medical HCPs have been trained, supervised and then recognised as competent to authorise blood components. The number of non-medical authorisers of blood components will increase over time.

The Blood Components Authorisation Chart is a vital part of the required documentation for a transfusion. This topic is addressed in **Step 6**

Some patients have “special requirements” for blood components, e.g. Cytomegalovirus (CMV) Negative, Irradiated and others such as Hb S Negative.

Q21 Please see your local policy and give 2 examples where patients require:

a) Irradiated blood

b) CMV negative blood

(4)

All staff have the right and responsibility to question the indication for, and authorisation of, a transfusion. They also have the right to refuse to administer a blood component where they have clear knowledge that the transfusion is unnecessary or that the patient has declined consent.

SHOT has reported incidences of patients being over transfused leading to death. Staff must be confident to challenge poor authorising of blood components as a vital element of patient safety.

Q22 Give two examples where registered HCPs have the right to refuse to administer a blood component.

(2)

Q23 What blood components must be given through an administration set with a 170-200µm filter?

(1)

Final Bedside Check before Administration

The final check of a blood component before being administered to a patient **must take place at the patient's side.**

In 2016 the Central Alerting System (CAS) of the Department of Health issued an urgent safety alert (CEM/CMO/2017/005) calling for the use of a transfusion bedside checklist following a high profile case of a patient death after an ABO-incompatible blood transfusion. A nurse collected and then administered a unit intended for another patient with a similar name. A correct final bedside check would have prevented this tragic outcome.

There were four ABO-incompatible transfusions reported to SHOT in 2018: all were preventable. In addition to the risk of ABO incompatible transfusion, patients may have other specific transfusion requirements such as irradiated, CMV negative and extended phenotype blood.

Two **CRITICAL PATIENT IDENTIFICATION (ID)** steps occur in preparation for transfusion:

1. PRE-TRANSFUSION BLOOD SPECIMEN COLLECTION:

Correctly identify the patient (Positive Verbal ID and Wristband) and Correctly label the pre-transfusion blood sample at the patient's side to ensure correct ABO crossmatch.

2. FINAL BEDSIDE CHECK:

Correctly identify the patient (Positive Verbal ID and Wristband) and ensure the patient identifiers match exactly on the blood component and all documentation to ensure right blood, right patient.

Evidence from SHOT shows that the final bedside check is not always undertaken correctly which puts patients at risk of serious complications or death. SHOT therefore recommend a structured process with a bedside checklist (*Table 4*).

For absolute clarity, the final bedside check consists of:

Step 1 - Right Patient

Step 2 - Right Blood Component

In order to be consistently safe, the check should be strictly carried out in order: Step 1 (Right Patient) then Step 2 (Right Blood). Only when satisfied all details are correct and match exactly should the blood component be administered. The matching process is best done by reading aloud as it sets the right pace, whether checking alone or with two staff.

Transfusion policies vary but all require at least one registered HCP carries out the final check and administers the blood transfusion. Where two staff are required, the concept of 'Double Independent Checking' must be incorporated: this is where both parties ensure that they have witnessed ALL the sources of identification separately and are individually accountable for the Right Patient Right Blood check (they do not check together)

Increasing numbers of Healthcare Providers have invested in electronic patient identification and blood administration systems. The authors recognise these systems as assets for patient safety but caution that they should not prevent or deter HCPs from examining and checking the blood component they are administering. IT systems are only as safe as the humans who input the data into them. Embrace the technology, but don't ignore your own personal checking systems. If there are any mismatches or errors in any of the information **DO NOT** transfuse until fully resolved.

Q24 What does SHOT recommend in order to ensure the final bedside check is followed correctly?

(1)

Q25 Is it ever acceptable to carry out the final pre-transfusion checks away from the patient?



(1)

Positive Verbal Identification

Whenever possible, the patient should always be asked to "positively" identify themselves using open ended questions to reduce the risk of misidentification. This is required at all *CRITICAL* stages of the blood transfusion process and as we know, for all clinical interventions.

For orientated patients the minimum information they should state is First Name, Surname, and Date of Birth (DOB).

Right Patient, Right Blood

Table 4

Be safe! Use the bedside checklist		
<p>Check positive patient identification</p> <ul style="list-style-type: none"> - ask the patient to state first name, last name and date of birth - must match exactly those on patient identification band 	} Right patient	
<p>Check patient identification details on component pack</p> <ul style="list-style-type: none"> - against patient identification band and prescription 		
<p>Check the prescription</p> <ul style="list-style-type: none"> - has this component been prescribed? 	} Right blood	
<p>Check the component</p> <ul style="list-style-type: none"> - is this the correct component? - is the component ABO-compatible with the recipient? - expiry date - donation number and blood group must match attached laboratory produced label - for any signs of leakage or damage to packaging and inspect for any defects 		
<p>Check for specific requirements</p> <ul style="list-style-type: none"> - does the patient need irradiated components or specially selected units? 		
Signature: _____		

Wristbands

All patients receiving a blood transfusion must have an accurate and legible wristband; the only exceptions will be listed in your Trust's Patient Identification Policy where the extra precautions required will be stated. (For regularly transfused patients, your Trust may have introduced patient photo identification cards; these may replace the wristband, but do not replace positive verbal identification).

Compatibility Label / Patient Label

(Label attached by the Transfusion Laboratory)

The HCP responsible for administering the blood transfusion must be satisfied that an ABO & Rh D group compatible blood component has been issued by the Transfusion Laboratory before commencing the transfusion.

Blood Component

The blood component itself should be inspected to make sure that there are no signs of damage to the bag and no evidence of infection (e.g. turbidity, colour change or clots).

Donation no

Component Type



ABO & RhD group

Expiry Date

Blood Authorisation (Prescription) Chart

Check the chart contains the patient's minimum data set and is clearly and accurately completed; including the authoriser's name and signature and that any special requirements are stated. It is also important to check whether the patient has been prescribed a pre-medication before commencing the transfusion.

NB. Medication should never be added to a blood component.

Q26 What Information must be included in the "patient's minimum data set" that must be on the prescription, wristband and component label?



(4)

Q27 Before administering a unit where possible you must ask the patient for their minimum data set, what do you check this against? (Table 4)



(3)

Q28 Why must you ask the patient to state their full name and DoB rather than asking them to confirm it?



(1)

Q29 You check the component for special requirements and damage what else must you check it for? (Table 4)



(4)

Q30 How would you identify the following patients during the final bedside administration check? Refer to your Trust's Patient Identification Policy or similar.

Known Patients (admitted) to the Patient Administration System (PAS)

Alert and Orientated:



(2)

Unconscious or unable to verbally identify themselves:

(1)

Q31 What information must be on an unknown patient's wristband e.g. in the Accident and Emergency Department?
(You may refer to the National Patient Safety Alert: Safer temporary identification criteria for unknown or unidentified patients 2018)

(3)

Q32 What does "Double independent check" mean?

(1)

Does your Organisation use a one or two person bedside check?

(1)

Observation Schedule

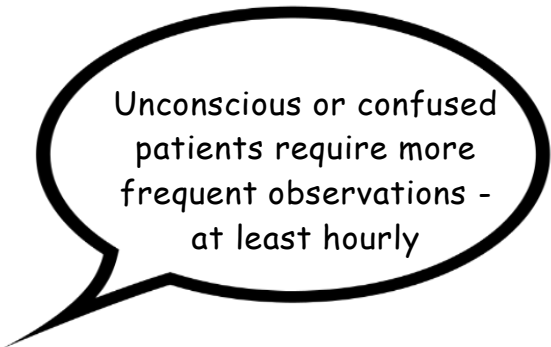


The observation schedule applies to every single component transfused. You must complete the observations listed in *Table 5*.

National Early Warning Score (NEWS2)

NEWS2 should be completed in full for all transfusion observations. It has been devised to assist early recognition of the deteriorating patient by assigning a numerical value to an abnormal vital sign.

The NEWS2 provides guidance as to when to seek medical assistance. The higher the score, the more senior review indicated and within a shorter timeframe. It is strongly recommended that all blood transfusion observations, including the NEWS2, are recorded on the same chart. This helps to firstly to detect changes and secondly to determine if these are due to the blood transfusion or could be seen in the trend prior to transfusion. Blood transfusion observations should be clearly identified, dated and timed as should any entry in the patient's documentation.



The First Five Minutes

It is good practice to spend the first five minutes with the patient at the start of the transfusion to identify early signs of an anaphylactic, allergic, or acute haemolytic transfusion reaction. This time can also be used to remind the patient to inform staff if they feel hot / cold / shaking / pain / itching / rash / something feels wrong, or any other symptoms throughout the transfusion. Also ensure that all documentation relating to the transfusion has been clearly completed (Blood Authorisation Chart, Observation Chart, and mechanism for blood traceability).

Observation Schedule - Record observations and actions taken *Table 5*

Timing	Action	Rationale
Before transfusion (up to 60 minutes before in stable patient)	Baseline Observations*	Establish Baseline
First 5 minutes	Stay with patient	Detect early signs of anaphylaxis or acute haemolysis
15 minutes	Observations*	Detect early signs of transfusion reactions
Continually if possible or at least every 30 minutes	Visually observe/ ask if the patient is feeling well	Detect signs of transfusion reactions /keep patient safe & comfortable
If you suspect a transfusion reaction	Stop Blood, Observations* with NEWS2. Obtain medical assistance (Step 7)	Minimise harm, treat any reaction quickly & appropriately

End of each unit Transfused	Observations* with NEWS2	Re-establish baseline/ detect changes during transfusion
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*Observations include: Blood Pressure, Heart Rate, Temperature, & Respiratory Rate. Additional observations e.g. Oxygen Saturation, Urine Output and Fluid Balance should be recorded if indicated by the patient's condition or local policy.

Patients With a Fever

There is sometimes misunderstanding around patients who present with a fever prior to receiving a blood transfusion. Having a fever is not a contraindication to a patient receiving a blood transfusion. If the fever is new, medical advice should be sought before the transfusion commences in case treating the fever is deemed to be a higher priority than the transfusion. **The importance of awareness of the risks of sepsis and escalating any findings that may indicate sepsis cannot be overstated.**

Care During Transfusion



Observe the patient throughout the transfusion, checking at a maximum of 30 minute intervals by observing and asking the patient if they feel well. Be guided not only by the patient's response but also your instincts as to how they appear and whether they are changed from how they are normally. Even greater care is required for patients who are very young, unconscious or confused because they cannot reliably inform you of any untoward symptoms. These patients should have a more frequent observation schedule.

If there is any cause for concern the transfusion should be stopped and the patient's signs and symptoms investigated, calling on medical help if necessary.

Completing a Blood Transfusion

A full set of observations including NEWS2 is required on completion of every single component.

All patients in a clinical setting have the potential for their underlying condition to deteriorate. Arguably patients who require a blood transfusion are already compromised and therefore more likely to deteriorate, or to be taking new and multiple medications with potential side effects.

If the end of transfusion observations are not completed and the patient deteriorates, it won't be possible to assess what part the transfusion has played in the change and this may lead to a delay in the appropriate treatment.

Dispose of all equipment safely in accordance with your Trust's Sharps and Infection Control Policy. Dispose of empty blood component bags in accordance with your Trust's transfusion policy.

Q33 State the minimum observation schedule for every blood component transfused to patients in your Trust.



(3)

Q34 List the 4 most important vital signs that should be measured.

(4)

Q35 How is a patient's respiratory status assessed?

(3)

Why is this particularly important in transfusion?

(1)

Q36 What 2 actions would you take if the baseline observations (before starting) the transfusion showed the patient had a new fever?

(2)

Q37 Why must a full set of observations be completed at the end of every component?

(1)

Q38 Refer to your local guidelines and list 3 examples of when it is appropriate to change a blood giving set.

(3)

Q39 Describe the recommended practice in your Trust for disposing of empty blood component bags and giving sets.

(1)

Extra Considerations when Transfusing Blood Components at Night

It is safer for patients who are not acutely unwell or significantly symptomatic to avoid overnight transfusions.

Extra risks arise at night including:

- Reduced staffing levels (medical, nursing and laboratory) to monitor patients and manage complications.
- Visual observation of the patient is impaired at night due to lower light levels.
- Every effort should be made to promote patients' normal sleep pattern
- Patients disturbed from sleep may not give you an accurate description of how they are feeling.



Patients who are significantly symptomatic of anaemia or acutely unwell (exacerbated by anaemia) or who have urgent requirements for other blood components should be transfused without delay. The urgency of every patient's blood transfusion should be discussed with the clinical team.

Patients receiving a blood transfusion should be observed throughout the transfusion episode, therefore isolated side rooms should be avoided whenever possible.

Q40 Give 2 examples of when is it appropriate to transfuse a patient overnight.

(2)

Infection Control

The use of aseptic technique, observation of universal precautions, and product sterility are required in all infusion procedures. ([RCN "Standards for Infusion Therapy"\(2016\)](#)). You must know and apply your Trust's infection control policy.

Infusion Times: Adult Patients

Most authorisations for blood components for adults state the time over which the transfusion should be administered, but occasionally an infusion rate may be specified.

The infusion time (or rate) will depend on the individual patient's clinical parameters at the time of prescribing. It is vitally important that changes to the patient's clinical parameters are reported and documented promptly, and any necessary changes to the infusion time are made.

Use of a suitable infusion pump, for non-urgent red cell transfusions, is preferable to gravity feed systems because it ensures greater control of the flow of blood and will alarm if there are issues with the flow.

Q41 Complete the following table:

Component	Usual Rate of Infusion
Red cells - Non-Urgent	
Platelets	

Fresh Frozen Plasma (<i>FFP</i>)	(3)
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Q42 Identify one risk with rapid transfusions to frail, elderly patients or the very young.

(1)

(Questions 43 & 44 for registered children's nurses, paediatric ODPs and Medical Staff only)

Note: All figures are only for guidance and will depend on the exact volume given and clinical status of the patient. For neonates and children, it is important that the **exact volume** is prescribed as well as the time over which it should be given.

Never administer more to a child than an adult would receive.

Infusion Times: Neonates

Q43 Complete the following table:

Component	Volume (mL/kg)	Infusion Rate
Red cells (Non-Urgent)		
Platelets		
FFP		
Cryoprecipitate		(8)

Infusion Times: Paediatrics

Q44 Complete the following table:

Component	Volume (mL/kg)	Infusion Rate
Red cells (Non-Urgent)		
Platelets		
FFP		
Cryoprecipitate		(8)

Step 6 - Documenting Transfusion

Transfusing blood components can be described as a human tissue transplant and the process contains inherent risks (summarised in *Table 3*).

Therefore: Accurate and Legible documentation is essential. The record must demonstrate that the transfusion was administered safely and transfusion policy was adhered to throughout.

Essential items are:

- Indication for the blood transfusion (not just blood results)
- Informed Consent was obtained
- Authoriser's name on the Authorisation Chart

- Administrating and Checking staff names
- The Start and End times
- Blood Component Donation Number
- Observations completed
- Any untoward effects assessed and acted upon as appropriate

All associated documentation available:

- Observation Chart
- Fluid Chart
- Medical Notes
- Surgical/Anaesthetic record



High standards of care require high standards of documentation to enable:

- Effective communication between HCPs
- Audit of practice
- Investigation of adverse effects of transfusion

Traceability

All staff who are deemed competent to administer blood components must know their responsibilities under the Blood Safety and Quality Regulations 2005, including providing the final fate of any handled blood components (Traceability).

Traceability systems vary between Healthcare Providers; some use electronic tracking systems and some use paper based tag systems. As soon as the patient has been administered one drop of the blood component they have been exposed to all the potential risks of Transfusion Transmitted Infection and some of those associated with adverse immune responses so traceability must be completed.

Q45 Describe the traceability system in place in your Trust.

(2)

Q46 Who takes the responsibility in the clinical area to ensure that traceability (final fate) has been proven? (refer to BSQR p.6)

(1)

Q47 How long does the BSQR require that the Trust legally needs to keep traceability records?

(1)

For what clinical reason?

(1)

Step 7 Managing Transfusion Reactions

As with all areas of healthcare practice, confidence grows with learning from experience. The same applies to the management of transfusion reactions, though fortunately these are rare occurrences. Safe patient care can be delivered if staff take a sensible approach.

When a reaction is suspected, the transfusion must be stopped and your Trust's transfusion policy followed. Take a full set of observations with the NEWS2 and seek prompt medical advice.

A number of tools have been developed to assist clinical staff in identifying and managing acute transfusion reactions such as *Table 6*. One advantage of this tool is that, via measurable parameters, it classifies reactions to mild, moderate and severe.

For mild (and a few moderate) reactions, the patient has already been exposed to all the risks of the blood component and still needs the full benefit of the transfusion; so after appropriate intervention the component will often be re-started. Additionally there is further risk in introducing a new blood component.

For the remaining moderate and certainly for severe reactions the blood component must be stopped as it is clearly causing more harm than the intended benefits.

In addition to medical assistance and intervention, the Transfusion Laboratory must be informed so that they can assist in the investigation and report to SABRE and SHOT as required.

When preparing to administer a blood transfusion it is good practice to refresh your understanding of the different signs and symptoms of a transfusion reaction. *Tables 7 – 10* list four types of reactions as a useful reference guide.

Patients who have been suspected or confirmed as having a transfusion reaction must have this explained to them. This information could be important if they require a blood transfusion in the future.

N.B delayed reactions may develop days or weeks after transfusion.

Transfusion Reactions - For Guidance (Based on the ISBT/IHN Classification of Acute Transfusion Reactions) (Table 6)

Reaction Type	Mild	Moderate	Severe
Febrile	Temp. $\geq 38^{\circ}\text{C}$ & a rise of between $1\text{-}2^{\circ}\text{C}$ from baseline, no other symptoms/signs	Temp. rise $\geq 2^{\circ}\text{C}$ or fever $\geq 39^{\circ}\text{C}$ &/or rigors, chills, or other inflammatory signs such as myalgia or nausea which precipitate stopping transfusion	Temp rise $\geq 2^{\circ}\text{C}$ &/or rigors, chills, or fever $\geq 39^{\circ}\text{C}$, or other inflammatory signs (e.g myalgia or nausea) which precipitate stopping transfusion, prompt medical review AND/OR results in, or prolongs hospital stay
Allergic	Transient flushing, urticaria or rash	Wheeze or angioedema, may have flushing/urticaria/rash but no respiratory compromise or hypotension	Bronchospasm, stridor, angioedema or circulatory problems needing urgent medical intervention or prolong hospital stay. Anaphylaxis (severe, life-threatening, hypersensitivity, rapidly developing airway &/or breathing &/or circulation problems, usually with skin & mucosal changes)
Both allergic & febrile features	Features of mild febrile & mild allergic reactions	Features of both allergic & febrile reactions, at least one of which is in the moderate category	Features of both allergic & febrile reactions, at least one of which is in the severe category.
Hypotensive reaction		Isolated fall in systolic BP $\geq 30\text{mm}$ during or $< 1\text{hr}$ after transfusion & a systolic blood pressure 80mm or less in the absence of allergic/ anaphylactic symptoms. No/minor intervention required	Hypotension, as previously defined, leading to shock (e.g. acidaemia, impairment of vital organ function) without allergic or inflammatory symptoms. Urgent medical intervention needed

The following tables are intended as a guide only

Mild Febrile or Allergic Transfusion Reaction (Table 7)

<p>Immediate Actions:</p> <ul style="list-style-type: none"> • Stop Transfusion (check patient & unit ID) • After medical assessment it is usual to restart at a slower rate with increased direct observation (be mindful of the out of storage time and do not exceed 4hrs) • Assessment of risks of medication against the severity of reaction should be made in each case:
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- Paracetamol (adults 500–1000 mg) may be a useful antipyretic agent
- NSAIDs may be helpful in managing chills or rigors (*use with caution if low platelets or reduced platelet function*)
- Antihistamine may be helpful for pruritus or rash (with no other features)
- Monitor frequently (include urine output) to record response to medication

Moderate Febrile Reactions (Table 8)

Immediate Actions:

- Stop Transfusion (check patient & unit ID)
- Get Medical Assistance
- If reaction sustained, could this be a haemolytic reaction or bacterial contamination?
- Usual to discontinue, inform lab, return the unit & send blood samples as requested
- Consider Paracetamol

Moderate Allergic Reactions (Table 9)

Immediate Actions:

- Stop Transfusion (check patient & unit ID)
- If reaction sustained, could this be a haemolytic reaction or bacterial contamination?
- Usual not to re-start, inform lab, return unit & send samples as requested
- Consider Antihistamines, e.g. chlorphenamine orally or IV
- O₂ therapy & a short-acting inhaled beta-2 agonist, such as salbutamol, may be useful for respiratory symptoms

Severe (Life Threatening) Reactions (Table 10)

Immediate Actions:

- Stop Transfusion (check patient & unit ID)
- This is a medical emergency, manage as appropriate for an acutely ill patient
- Disconnect unit & giving set & send intact to the lab
- Maintain venous access with IV N/Saline
- If severely dyspnoeic, ensure patent airway & give high flow O₂ through a non-rebreathe mask

- **If wheeze without upper airways obstruction, consider nebulising with salbutamol**
- **Lay hypotensive patients flat with leg elevation, or in the recovery position if unconscious or at risk of vomiting**
- **Further management is dependent on expert medical assessment & appropriate specialist support**
- **Inform lab, send samples as requested**

Q48 Which hospital department must be informed of suspected blood transfusion reactions?

(1)

Why?

(1)

Q49 List 8 symptoms that a patient may experience if they are having a transfusion reaction?

(4)

Step 8 - Review of Transfusion

It is vitally important, having weighed up all the factors and decided that a blood transfusion is in the best interest of a patient, that the outcome of this treatment is reviewed.

This review again should not only take into account the results of blood tests such as Full Blood Count or Clotting Screen, but also any clinical symptoms and how the patient is now feeling.

If blood transfusions are not thoroughly reviewed, the full benefits of learning for the whole MDT that will improve blood transfusion practice in the future cannot be realised.

The other advantage of thorough review of a blood transfusion is the benefit to the patient: so they can share whether the intended outcomes have been reached. This is particularly important for chronically transfused patients who should be as much a part of the decision making process as possible and in setting their individualised targets.

Q50 Give two key reasons why a transfusion should be reviewed

(2)

References

[British Standards in Haematology \(BSH\) \(2016\) Guideline on the Administration of Blood Components](#) [Accessed 07/01/19]

[British Standards in Haematology \(BSH\) \(2012\) Guideline on the Investigation and Management of Acute Transfusion Reactions](#) [Accessed 07/01/19]

[British Standards in Haematology \(BSH\) \(2016\) Transfusion Guidelines for Neonates and Older Children](#) [Accessed 07/01/19]

[Blood Transfusion NICE Guideline \[NG24\] \(2015\)](#) [Accessed 07/01/19]

[Right Blood, Right Patient. Right Time RCN guidance for improving transfusion practice 3rd addition \(2013\)](#) [Accessed 07/01/19]

[HSC 1998/224 Better Blood Transfusion](#) [Accessed 07/01/19]

[HSC 2007/001 Better Blood Transfusion: Safe & Appropriate Use of Blood](#) [Accessed 03/01/19]

[Serious Hazards of Transfusion \(2011\), Definitions of current categories and what to report](#) [Accessed 03/01/19]

[Department of Health. \(2012\) Never Events List 2012/13 - Transfusion of ABO-incompatible blood components](#) [Accessed 07/01/19]

[International Haemovigilance Network \(IHN\). \(2012\) Definition of haemovigilance](#) [Accessed 07/01/19]