Acknowledgements

We would like to thank everyone who reviewed this edition of Right blood, right patient, right time: RCN guidance for improving transfusion practice.

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The Transfusion process section was adapted, with permission, from the Scottish National Blood Transfusion Service Better blood transfusion continuing education programme – level 1 safe transfusion practice materials.

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Published by the Royal College of Nursing, 20 Cavendish Square, London, W1G 0RN

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Right blood, right patient, right time

RCN guidance for improving transfusion practice

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Introduction

Around 2.9 million blood components are issued every year in the UK. Blood transfusion is generally a safe process that saves lives and improves the quality of life for patients with a large range of clinical conditions. However, there are a number of risks associated with transfusion, as with any other clinical intervention.

Right blood, right patient, right time: RCN guidance for improving transfusion practice sets out pragmatic advice for nursing staff in the administration of red blood cells and other blood components (fresh frozen plasma, cryoprecipitate and platelets). The guidance is not wholly evidence-based but built on recommendations to improve the safety of blood ordering and administration from current national guidelines and Serious Hazards of Transfusion (SHOT) reports (SHOT, 1996 – 2011), British Committee for Standards in Haematology (BCSH), 2009, Department of Health (DH) 1999, 2002, 2007.

The EU Directive 2005/62/EC requires that all staff must be trained and competent to perform their tasks. The National Patient Safety Agency (NPSA) Safer practice notice (SPN) 14 (2006) and NHS Quality Improvement Scotland (NHSQIS) Clinical standards for blood transfusion (2006) have stipulated the required standards for training and assessment and these are endorsed by BCSH and SHOT.

In 2005 two EU directives – 2002/98/EC and 2004/33/EC – were transposed into UK law through the Blood Safety and Quality Regulations 2005 (Statutory Instrument 2005/30 and Statutory Instrument 2005/1098). These regulations set the standards for quality and safety for the collection, testing, processing, storage and distribution of human blood components. There are two aspects of the regulations which directly impact on practitioners involved in the clinical transfusion process:

- **traceability** asserts that we must have unambiguous evidence of the final fate of every blood component issued from the transfusion services, and that the record is kept for 30 years
- **haemovigilance reporting** requires that any serious adverse event or serious adverse reaction, which might lead to death or life-threatening, disabling or incapacitating conditions for patients or which results in or prolongs hospitalisation or morbidity, must be reported to the UK competent authority, the Medicines and Healthcare products Regulatory Agency (MHRA). The MHRA hosts an online reporting system, SABRE, to facilitate reporting of serious adverse events and reactions. For more information go to www.mhra.gov.uk

Despite these initiatives transfusion errors continue to occur and recent audits of transfusion practice in the UK have demonstrated that patients are placed at risk. The National comparative audit of blood transfusion re-audit of bedside transfusion practice (2011) highlighted that:

- 2.3 per cent of patients were not wearing an identity band at the time of the audit despite the fact that a blood transfusion was in progress
- 85 per cent of patients had all four pre-transfusion observations recorded
- 87 per cent had observations within 30 minutes following the start of the transfusion
- 84 per cent had the required observations at the end of the transfusion.

**Transfusion risks**

SHOT is a professionally mandated, anonymised reporting scheme, which collects data on the serious consequences of the transfusion of blood components in order to:

- educate users in transfusion hazards and their prevention
- improve standards of hospital transfusion practice
- inform policy in transfusion services and aid the production of clinical guidelines on the use of blood components.

Participation in the SHOT reporting scheme has increased from 22 per cent of NHS hospitals in 1996 to 98.4 per cent in 2011, and reporting rates in the UK have risen from 4.8 events/10,000 blood components in 2007 to 11.6 events/10,000 components in 2011.
Over 3,000 cases of incorrect blood component transfused (IBCT) have been reported since 1996, where a patient was transfused with a blood component which did not meet the appropriate specification, or was intended for another patient. All of these cases were avoidable and many of these cases involved multiple errors in the transfusion process.

Within the IBCT category, transfusion of ABO incompatible components continues to result in major morbidity.

Acute transfusion reactions (ATR) represent the largest category of pathological and unforeseen events and was the leading cause of major morbidity in 2011. Meanwhile, transfusion associated circulatory overload (TACO) remains an important cause of potentially avoidable major morbidity and death.

SHOT continues to highlight the importance of individual patient assessment and monitoring, the rate of transfusion and fluid balance (2010); the SHOT annual reports and summaries can be accessed via the SHOT website at www.shotuk.org.

**Box 1**

**Typical SHOT IBCT errors (SHOT, 2011)**

- The blood sample was drawn from the wrong patient.
- Patient details were recorded incorrectly on the blood sample label or the blood request form.
- The incorrect unit was collected from the blood refrigerator.
- The final formal identity check at the patient’s bedside, prior to transfusion, was omitted or performed incorrectly.
The transfusion process

“The systems and processes involved in the transfusion pathway are very complex. Organisations should focus on simplifying procedures and concentrate on key steps, especially patient identification.”

(BCSH, 2009)

“Only staff who are trained and competent should participate in the blood transfusion process.”

(BCSH, 2009)

Nurses and midwives regularly take responsibility for completing the request form, taking a blood sample for pre-transfusion testing, collection, administrating blood components and monitoring the patient during the transfusion episode (BCSH, 2009). Increasingly nurses and midwives are also taking responsibility for the authorisation of blood components; organisations should ensure they develop a clear policy when extending the authorisation of blood components to other appropriately trained and competent practitioners (BCSH, 2009). Irrespective of who authorises the transfusion, “The decision to transfuse must be based on a thorough clinical assessment of the patient and their individual needs. The rationale for the decision to transfuse and the specific components to be transfused should be documented in the patients’ clinical records.”

(BCSH, 2012a)

The publication A framework to support nurses and midwives making the clinical decision and providing the written instruction for blood component transfusion is available to support this initiative (Pirie and Green, 2009), and can be accessed and downloaded at www.transfusionguidelines.org.uk

Informing the patient

“It is a general legal and ethical principle that valid consent must be obtained before starting treatment … this principle reflects the right of patients to determine what happens to their own bodies and is a fundamental part of good practice.”

(DH, 2009)

The Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) has issued recommendations on consent for blood transfusion (2011); these can be viewed and downloaded at www.transfusionguidelines.org.uk.

When you care for a patient who is about to undergo a blood transfusion, you should:

- inform the patient/legal guardian about the intended transfusion therapy and ensure the potential risks, benefits and alternatives have been explained; provide them with an information leaflet and give them the opportunity to discuss it and raise any concerns that they may have
- check that the decision to transfuse, rationale and valid consent is recorded in the patient’s clinical records before administering the blood component
- ensure any patient who has received a blood transfusion and who was not able to give valid consent, is provided with information retrospectively.

Good practice advice

You should give all patients who may receive a blood transfusion a full explanation about the proposed treatment. Use the patient information leaflets that are available from your local hospital, trust or blood transfusion service. For an example of leaflets available to users, visit http://hospital.blood.co.uk

Sampling

“A patient identification band (or risk assessed equivalent) must be worn by all patients receiving a blood transfusion.”

(BCSH, 2009)

When you take a blood sample, you should:

- ask the patient to state their first name, surname and date of birth to check that you have the right patient before you draw the sample
• ask another member of staff, relative or carer to verify the patient identification details if the patient is unable to do this; for example, because they are unconscious or a child
• check the details against the patient’s identity wristband (it must match exactly) or assessed equivalent
• ensure that all infection prevention requirements are met as per local policy, for example, hand hygiene, management of sharps etc
• collect the required amount of blood into the appropriate sample tube; for example, this should be a minimum of 1ml for neonates or very young patients
• label the sample tube clearly and accurately with the patient details that you have taken from the identity wristband, including the unique identification number before you leave the patient
• sign the sample tube as the person drawing the sample
• check that the patient details on the sample tube and request form correspond
• send the blood sample tube and request form to the hospital transfusion laboratory (HTL) with the appropriate request date and time
• refer to local trust policy and manufacturer’s guidelines (available from your transfusion practitioner) where electronic systems are in place.

**Good practice advice**

When taking a blood sample you should:

• spell the patient’s name correctly and consistently when you label the sample tube and complete the request form
• give all unconscious patients a unique patient identification number and record the gender on the identification wristband as a minimum
• bleed only one patient at a time in order to reduce the risk of a patient identification error
• avoid taking the blood sample from the arm that is an infusion site because this may result in a diluted sample being sent for analysis, or a spurious laboratory result being obtained
• never pre-label the sample tube – for example, do not write the details on the sample label in advance of drawing the blood; the pre-labelling of sample tubes has been identified as a major cause of patient identification errors that can lead to fatal transfusion reactions
• ensure that a valid reason for transfusion is provided on the request form and record any past relevant transfusion history and special requirements, such as irradiated components.

**Collection**

Prior to collecting the blood component you should ensure:

• the patient is wearing an identification band or assessed equivalent
• patient consent and indication for transfusion are recorded in the patient’s clinical record
• there is a written instruction for transfusion on an approved chart
• the patient has appropriate and patent intravenous access
• suitably trained and competent staff will be available for the duration of the transfusion
• the patient’s baseline observations of pulse rate (P), blood pressure (BP), temperature (T) and respiratory rate (R) have been recorded.

You should ensure that every blood component collected is checked against the patient’s minimum identification data set (BCSH, 2009 and see Box 2). You should:

• check that the details on the blood component collection form, or local documentation, match the information on the patient’s wristband before passing the request to the person collecting the blood component
• check the patient’s identification details on the blood component collection form, or local documentation, against the patient compatibility label on the blood component that you have just collected
• check the expiry date of the component
• only collect one unit for each patient at a time (except in a massive haemorrhage alert)
• document the removal of the blood component by putting the date, time and signature of the person
removing it onto the blood register or electronic release system

- inform the person who requested the blood component that it has arrived, as soon as it is delivered, ensuring they are aware of the time it was removed from storage
- record the date and time the component arrived in the clinical area
- where electronic systems are in place please refer to local trust policy and manufacturer’s guidelines (available from your transfusion practitioner).

Box 2

<table>
<thead>
<tr>
<th>Patient minimum identification data set</th>
</tr>
</thead>
<tbody>
<tr>
<td>First name(s)</td>
</tr>
<tr>
<td>Surname</td>
</tr>
<tr>
<td>Address (in certain UK regions)</td>
</tr>
<tr>
<td>Date of birth</td>
</tr>
<tr>
<td>Unique patient identification number</td>
</tr>
<tr>
<td>Gender (in certain UK regions)</td>
</tr>
</tbody>
</table>

Pre-administration

The transfusion should begin as soon as possible after the blood has arrived in the clinical area (BCSH, 2009). You should check the:

- patient understands the process and why the transfusion is being given and explain the procedure fully
- baseline observations, (P, BP, T and R) have been recorded no more than 60 minutes before starting the transfusion of each unit of blood
- expiry time (midnight unless specified) and date of the blood component and undertake a visual inspection for any signs of discoloration, clumping or leaks.

You also need to check if the patient has any special requirements, such as irradiated blood and if they require any concomitant drug, such as a diuretic.

Good practice advice

If there are any discrepancies at any point, it is important that you do not proceed until these have been resolved.

Administration


“The final administration check must be conducted next to the patient by a trained and competent health care professional who also administers the component.” (BCSH, 2009)

Remember to follow these action points:

- positively identify the patient (see Box 2) using an open question “can you tell me your full name and date of birth?”
- ask another member of staff, relative or carer to verify the patient identification details if the patient is unable to do this; for example, if the patient is unconscious or a child
- check these details against the patient’s identification band for accuracy or assessed equivalent
- check that all the details on the patient’s identification band match exactly the details on the written instruction chart and the compatibility label attached to the blood component
- the blood group and the donation number on the compatibility label are identical to the blood group and donation number on the blood component
- repeat this process for each component administered
- where electronic systems are in place please refer to local trust policy and the manufacturer’s guidelines (available from your transfusion practitioner).

Good practice advice

The following key points should be observed:

- if there are any discrepancies at any point, it is important that you do not proceed until these have been resolved
- the environment in which the transfusion is conducted must provide adequate working space and allow staff responsible for the final patient identity check to carry out an uninterrupted procedure
if you are interrupted in the checking procedure you must start again
if two health care professionals are required (local policy) to perform the final check, this should be completed independently
you must perform hand hygiene and follow your local infection control policy when you administer blood components.

Patient monitoring

“Observations should be undertaken and documented for every unit transfused.”

(BCSH, 2009)

“Good record keeping is an integral part of nursing and midwifery practice and is essential to the provision of safe and effective care.”

(NMC, 2007)

You should:

- ensure that the patient is in a setting where they can be directly observed and where staff are trained in the administration of blood components and the management of transfused patients, including the emergency treatment of anaphylaxis
- advise and encourage your patient to notify you immediately if they begin to feel anxious, or if they become aware of any adverse reactions such as shivering, flushing, pain or shortness of breath
- monitor the patient’s observations (T, BP and P) 15 minutes after you begin the transfusion of each unit and record them on the transfusion observation chart. If these measurements have changed from the baseline values, then R should also be taken
- adjust the flow-rate so that you achieve the correct infusion rate over the prescribed time period
- make additional observations (for example, oxygen saturations (SaO2) and urinary output (UO)) indicated by the patient’s condition and according to your local hospital policy
- monitor patients identified as at risk of TACO, for signs of circulatory overload, including fluid balance
- perform more frequent observations, for example, in rapid transfusion or patients unable to complain of symptoms
- document the start and finish times of each unit
- take and record post transfusion observations (P, BP and T) not more than 60 minutes after the end of the component transfusion
- record the volume of blood transfused on the fluid balance chart, or 24-hour chart
- document the donation number, component type and date transfused of each blood component transfused in the patient’s clinical record; follow your hospital policy for recording the final fate of the transfused unit (UK Blood Safety and Quality Regulations, 2005).

If you suspect a transfusion reaction

The BCSH (2012b) has issued guidance on the investigation and management of acute transfusion reactions which can be found at www.bcsghguidelines.com

If a reaction is suspected you should:

- stop the transfusion and immediately inform the doctor
- assess the patient’s airway, breathing and circulation (ABC); if the reaction appears life-threatening, call the resuscitation team
- maintain venous access with 0.9 per cent sodium chloride
- record the patient’s observations (T, P, R, BP, SaO2 and UO)
- check the core identification details correspond between the patient, their identity band and blood component compatibility label
- inspect the component for unusual clumps, particulate matter or discolouration
- inform the hospital transfusion laboratory
- return the unit and administration set to the transfusion laboratory
- record the adverse event in the patient’s clinical record
- report the adverse event in accordance with your hospital transfusion policy.
**Good practice advice**

You should monitor patients closely during the first 15 minutes of the blood transfusion because severe reactions can occur in the early stages of the process.

Inpatients should be observed for late reactions during the subsequent 24 hours. Day case and short stay patients should be advised of the possibility of late reactions and be provided with contact details for accessing clinical advice.

**Technical aspects of administering blood components (RCN Standards for infusion therapy, 2010.)**

- The size of the cannula depends on the size of the vein and the speed at which the blood is to be transfused.
- Blood components must be transfused through a blood administration set with an integral mesh filter (170–200µm pore size).
- The administration set should be changed at least every 12 hours, between transfusion of different blood components, on completion of transfusion and prior to infusion of any other intravenous fluids.
- Special paediatric administration sets should be used as appropriate. In neonatal and paediatric practice, where small volume transfusions are being drawn into a syringe for transfusion, an appropriate filter must be used (BCSH, 2004).
- Electronic infusion pumps may be used for blood components providing they have been verified as safe to use for this purpose by the manufacturer, and an appropriate administration set is used. You should ensure that the correct flow rate is set.
- The use of blood warmers is indicated for patients with clinically significant cold agglutinins, adults receiving an infusion of blood at rates >50 ml/kg/hour; children at rates > 15 ml/kg/hour and exchange transfusion of infants (RCN, 2010). Blood warmers should be specifically designed for that purpose, include a visible thermometer, audible alarm and undergo routine maintenance and quality control testing. Never improvise by warming blood components in hot water, in a microwave or on the radiator.
- The health care professional should demonstrate knowledge and competency which has been assessed relative to electronic infusion devices. They are responsible for monitoring the patient and accountable for the use of electronic flow control devices (NMC, 2007; NMC, 2008).
- “Under no circumstances should drugs be directly added to a blood component bag” (BCSH, 2009).
- “The addition of a drug to an intravenous line containing blood or blood components raises concerns about compatibility of the drug and its carrier with the blood component and any preservatives or additives.” (BCSH, 2009).
- All blood component transfusions should be completed within four hours of removal from temperature controlled storage (BCSH, 2009). Red cell units that have been out of refrigeration and have not been transfused within four hours must be returned to the blood bank. Rationale: once out of the cold chain, the pack will slowly warm to ambient temperature, increasing the risk of bacterial proliferation and red cell metabolism. Blood bank quality procedures must ensure that all red cell units available for transfusion have remained under approved storage conditions.
- Discard the empty blood bags according to your hospital transfusion policy.
The role of the nurse in the transfusion process

To promote and safeguard the patient's interests and wellbeing, the Nursing and Midwifery Council (NMC) advises that the administration of medicines “is not solely a mechanistic task to be performed in strict compliance with the written prescription of a medical practitioner (can now also be an independent and supplementary prescriber). It requires thought and the exercise of professional judgement.” (NMC, 2007).

Although not categorised as medicinal products, the same criteria should apply to the administration of blood components.

By becoming educated practitioners in the blood transfusion process, nurses can demonstrate their skill and competency in this field. This will lead to increased compliance when involved in patient identification procedures and record keeping.

Further, it should improve patient outcomes and reduce clinical risk and error rates. In order for nurses to authorise a blood component they will need to undertake specific training, which can be provided either by the hospital, trust or an external organisation. The Independent and Supplementary Prescribing for Nurses and Midwives and Supplementary Prescribing for Allied Health Professionals (V300) course does not include the authorisation of blood components.
The role of the transfusion practitioner

The four UK health departments (2002) and SHOT (2004) recommended that every trust/board should employ a hospital transfusion practitioner, such as a specialist nurse or biomedical scientist. Hospital transfusion practitioners, working with lead consultants in blood transfusion and local blood bank managers, support clinical teams in the safe and effective use of blood. They also actively promote good transfusion practice by:

- endorsing national guidelines and evidence-based practice
- facilitating transfusion audit and feedback (continuous improvement)
- facilitating incident reporting and follow up on any errors or near misses
- encouraging education/training and increasing clinical competency
- participating in the implementation of new technologies that enhance patient safety (Gray and Melchers, 2003; Dzik, 2003).

The National Transfusion Practitioner Survey of England and North Wales (2010) recommended that a multi-faceted approach is required to realise further improvements in patient safety and reduction in risk with respect to transfusion issues. The findings and conclusions of the survey can be accessed at www.transfusionguidelines.org.uk

References


www.nmc-uk.org

Pirie E and Green J (2009) *A framework to support nurses and midwives making the clinical decision and providing the written instruction for blood component transfusion*. Available at www.transfusionguidelines.org.uk


Serious Hazards of Transfusion (annual SHOT reports from 1996 to 2011), which include those from years that are specifically referenced in this publication are all available on the SHOT website at www.shotuk.org

www.learnbloodtransfusion.org.uk


**Useful websites**

- Learnbloodtransfusion
  www.learnbloodtransfusion.org.uk

- NHS Blood and Transplant
  www.blood.co.uk

- Serious Hazards of Transfusion
  www.shotuk.org

- The British Committee for Standards in Haematology
  www.bcshguidelines.com

- The Medicines and Healthcare products Regulatory Agency
  www.mhra.gov.uk

- UK Blood Transfusion and Tissue Transplantation Guidelines
  www.transfusionguidelines.org.uk

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April 2013 Third edition

RCN Online
www.rcn.org.uk

RCN Direct
www.rcn.org.uk/direct
0345 772 6100

Published by the Royal College of Nursing
20 Cavendish Square
London
W1G 0RN

Publication code 002 306

ISBN: 978-1-908782-41-0