Royal Berkshire
NHS Foundation Trust

Trust Policy for Blood Transfusion

Approval and Authorisation

Reviewed by	Job Title	Date
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Approved by	Date
Hospital Transfusion Committee	14.09.2010

Change History

Version	Date	Author	Reason
Version 2.0	April 2008	Tanya Hawkins, Transfusion Practitioner	Second Version
Version 2.1	April 2008	Anne McDonald, Head of Nursing Standards	Non-clinical amendments
Version 3.0	September 2010	Tanya Hawkins, Transfusion Practitioner	Third Version

Trust Policy for Blood Transfusion 2010: Key Aspects

The following highlights the main aspects that have been updated in the Blood Transfusion Policy 2010.

Core patient identifiers
Core patient identifiers are full name, date of birth and NHS number. All three identifiers must be present on any documentation relating to blood transfusion. This includes the patient's identification band, request card, prescription (transfusion care pathway) and unit of blood.

Positive patient identification
All patients should, whenever possible, have a positive patient identification check at each stage of the transfusion process. This means the patient is asked to state their full name and date of birth. These details are checked against the patient's identification band (or equivalent) and any other documentation involved in the transfusion stage e.g. request card, prescription.
If any discrepancy is found, the transfusion process should be stopped and the discrepancy investigated.

Indications for transfusion

There are no absolute thresholds for transfusion. The decision to transfuse remains a clinical decision. The patient's medical history, age and symptoms of anaemia need to be considered. The reason to transfuse should be documented in the clinical notes. Transfusions above the trigger Hb, should have documented symptoms of anaemia (palpitations, postural hypotension, angina) clearly stated in the clinical notes.

The amount of red cells to be transfused should take into account the patients medical condition and weight. Each unit of red cells should increase haemoglobin level by 1.0 g/dl

Patient	Trigger Hb	Target Hb
Less than 65 years with no cardiac or respiratory disease	< 7.0	7.0
Over 65 years old with no cardiac or respiratory disease	< 8.0	9.0
History of cardiac disease or respiratory disease / bone marrow suppression	< 9.0	10.0

Single Unit Transfusion

There is nothing to support the view that the minimum 'dose' of a red cell transfusion for an adult is 2 units. The modern approach to red cell transfusion in patients without acute bleeding is to use conservative transfusion thresholds and to transfuse sufficient blood so that the patient's Haemoglobin exceeds the trigger but no more; this often means that a single unit is sufficient.

When to take a Second Transfusion Sample

To ensure patient safety, 2 transfusion samples taken on **separate occasions**, will be required prior to issuing blood components.
For the majority of patients the 2 transfusion samples relate to one current sample and a historic sample (this can be from days, months or years ago). Therefore the one taken on this admission is the only one required to issue blood components.

It does not mean that patients need 2 transfusion samples taken before blood components are issued.
Staff should continue to take 1 transfusion sample, regardless whether for Group and Save or crossmatch.

For a crossmatch, or when a Group and Save is converted into crossmatch, the Transfusion Laboratory will contact the clinical area and request a second sample if required.
For newly admitted patients who require blood components immediately the Transfusion Laboratory should be contacted on ext 7697 or bleep 298 and they will inform if 1 or 2 transfusion samples are required.

Transfusion rate of blood components

Component	Adult administration rate per unit	Paediatric administration rate
Red Cell	Maximum 3 hours No more than 4 hours	5ml/kg/hr No more than 4 hours
Platelets	No more than 30 minutes	10-20 ml/kg/hr
Fresh Frozen Plasma	No more than 30 minutes	10-20 ml/kg/hr
Cryoprecipitate (5 donor pool)	Given stat No more than 1 hour	10-20 ml/kg/hr

Final Administration Check: The Process

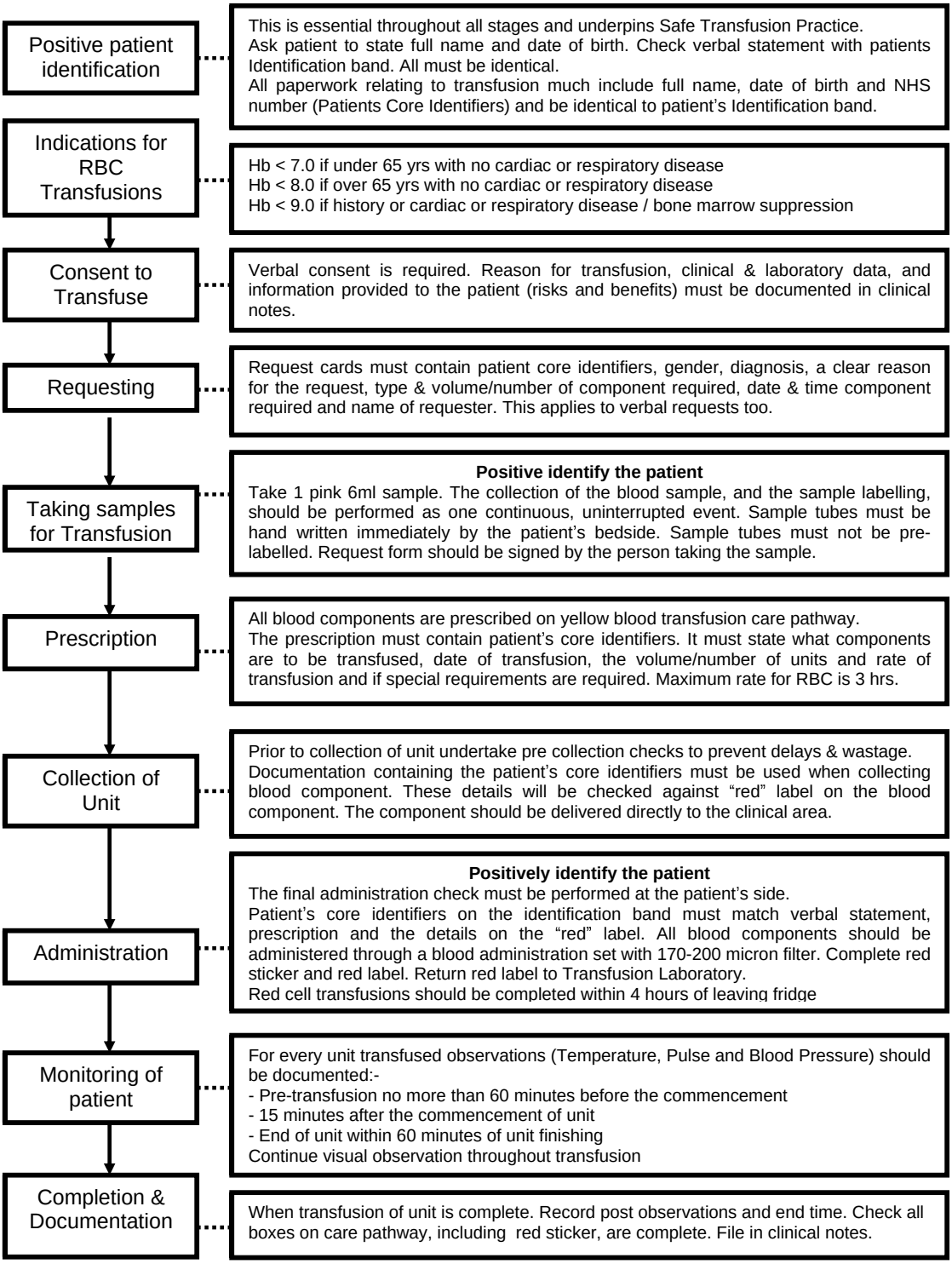
The final administration check must be performed at the patient's side. It is divided into patient checks and blood component checks.

Prior to starting the final administration check the following should all be together:-

- The patient
- Identification band (or equivalent) with last name, first name, date of birth and NHS number
- Prescription of blood component i.e. the blood transfusion care pathway
- Unit of blood component with laboratory generated "red" label attached

If two persons perform the final administration check, each person should complete all checks independently (double independent checking).

Diagram 1: Blood Policy Summary: Key Aspects of Each Stage



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Appendices

This policy should be read in conjunction with the following:

Patient Identification Policy
Administration of Intra Venous Drugs Policy.

1.0 Purpose

Blood components are potentially hazardous and should only be given when clinical benefit to the patient outweighs the potential risks. The reports of the Serious Hazards of Transfusion (SHOT)[1] committee show that by far the largest numbers of 'hazards', around 80%, are associated with incorrect blood component transfused[1]. This has led to several deaths and many more 'near misses'.

The purpose of this policy is to establish safe working practice based on up to date clinical information to ensure that blood transfusions are only administered when there is a clinical need, that blood transfusions are administered to the correct patient, at the right time and that any adverse reaction is dealt with promptly and effectively.

2.0 The Function of Policy

The aim of this policy is to ensure that there is a consistent approach to the processes involved in transfusion of blood components.

It has been written to standardise the care of the patient receiving a blood transfusion, to ensure the safe administration of blood components and the appropriate management of any adverse events.

All staff involved in the transfusion process know their role, responsibilities and the correct procedure for each process undertaken.

3.0 Policy Content

This policy has been written with reference to current national guidelines by British Committee Standards for Haematology[2], Serious Hazards of Transfusion recommendations and the legal requirement outlined by the directive 2002/98/EC of the European Parliament, translated into British law under the Blood Safety and Quality Regulations Act[3].

It comprises operational guidance for the administration of blood components and the management of the transfused patient.

The policy defines the correct procedure for each step within the transfusion process:- consent, request, pre transfusion sample collection, prescribing, collection and administration of blood components.

It includes the management of a patient receiving a blood transfusion and the management of a major haemorrhage. It includes guidelines on when to use blood components based on national guidelines written by the British Committee of Standards in Haematology [4,5,6,].

It includes the administration and use of Anti D immunoglobin[7,8].

It does not include the use of intraoperative or post operative cell salvage.

It does not include the laboratory standard operating procedures (SOP's) that are kept separately in the Blood Transfusion Laboratory.

4.0 Definitions

Allogenic Blood: Blood components collected from one individual and intended for transfusion to another individual.

Blood component: A statement that refers to the common types of blood that are transfused. E.g. red blood cells (RBC), platelets, fresh frozen plasma (FFP) or cryoprecipitate

Crossmatch: A request for a number of red cell units to be available for an individual patient. The units are available for 48 hours from date of request.

Electronic Issue: Red cell units made available for an individual patient, without the need for serological crossmatch, within 15 minutes of the request. This is suitable for patients without antibodies with a valid transfusion sample in the Transfusion Laboratory and an historic blood group on record.

Group and Save: A blood sample that is sent to the Transfusion Laboratory for blood grouping and antibody screening. It is valid for 7 days unless patient is transfused or pregnant. Once transfused, the sample is valid for 72 hours from start of transfusion.

Core identifiers: Patients last name, full name, date of birth and NHS number

5.0 Consultation on, and Ratification of Blood Transfusion Policy

The blood transfusion policy will be sent out to the following for consultation:-

- Chair of Hospital Transfusion Committee
- Lead consultant for Transfusion
- Transfusion Laboratory Manager
- Chief Nursing Officer
- Chief Medical Officer
- Chief Operating Officer
- Clinical Risk Manager

The blood transfusion policy will be approved by the Clinical Governance Board.

6.0 Dissemination, Circulation and Archiving of Blood Transfusion Policy

Once the policy has been ratified the policy will be disseminated via email to the following:-

- Divisional Matrons
- Clinical Directors
- Portering Services Manager
- Hospital Transfusion Committee Members
- Director of Corporate Affairs to place the policy on the intranet

The head of governance is responsible for archiving all previous versions and supporting evidence of approval for this policy.

7.0 Responsibilities of Staff

Many staff groups are involved in the blood transfusion process. Each staff group has their own responsibilities

Medical staff are responsible for:-

- appropriate prescribing of blood components, with particular reference to the Maximum Surgical Blood Ordering Schedule for surgical patients, haemoglobin transfusion thresholds and allogenic blood conservation.
- documenting special requirements for transfusion
- documenting reason for transfusion in the clinical notes

Medical, Nursing, Midwifery and Theatre Practitioner staff are responsible for:-

- requesting blood components using appropriate forms
- providing sufficient information on request forms
- checking the identity of the patient before blood sample collection
- using safe techniques for obtaining blood samples
- labelling blood sample tubes in accordance with Trust procedures
- explaining the risks and benefits of blood transfusion
- obtaining valid consent where appropriate for transfusion
- requesting collection of blood unit from blood refrigerator
- checking the identity of the patient before transfusion
- monitoring of the patient during transfusion
- documentation of transfusion in clinical notes
- reporting of transfusion reactions and adverse events

Phlebotomists, Health Care Assistants and Maternity Care Assistants taking blood samples are responsible for:-

- checking the identity of a patient before blood sample collection
- checking information written on the request form is complete
- using safe techniques for obtaining blood
- labelling blood sample tubes in accordance with Trust procedures
- reporting incidents relating to sample collection

The Portering Services Manager is responsible for ensuring that portering staff are competent and follow Trust procedures when collecting blood components.

Transfusion Laboratory staff are responsible for:-

- ordering and storage of blood components
- compatibility testing
- examining donations for any unusual features which may cause problems
- investigation and reporting of transfusion reactions and adverse events

Ward and department managers are responsible for:-

- ensuring that there are appropriate request forms available
- ensuring that blood transfusion care pathways are always available for prescription and documentation of transfusion episode
- ensuring staff have access to the policy, are aware of the content and have the competency to implement its actions
- ensuring that policy updates are brought to the attention of staff
- transfusion training of staff on induction and 3 yearly thereafter
- ensuring identity checks are always made when administering blood components
- investigation of transfusion reactions and adverse events

The Trust Board have ultimate responsibility for actions and inaction in relation to the blood transfusion policy. They are responsible for:-

- ensuring compliance with the Hospital Transfusion Committee guidelines and recommendations via the Clinical Governance Committee
- ensuring that Blood Transfusion local policies are in place and that all staff involved with transfusion practice receive training in these guidelines

8.0 Monitoring Compliance and Effectiveness

The Blood Transfusion policy will be monitored for compliance by undertaking the audits stated in the table below. Audits will be reviewed at the Hospital Transfusion Committee

Audit Title	Process Audited	Frequency	Responsibility
Request card audit	Written request for transfusion	6 monthly	Transfusion Practitioner
Discarded samples	Labelling of transfusion samples	On going	Transfusion Practitioner
Collection audit	Collection of red cell units	Annually	Transfusion Practitioner
Traceability audit	Documentation of administration Compliance with Blood Safety and Quality Regulations	On going	Transfusion Practitioner
Transfusion Practice Audit	Administration of blood components Monitoring of patient Documentation of administration (Audit Proforma in Appendix A)	Every 2 years	Transfusion Practitioner
National Comparative audits (NCA)	Use of Blood components Documentation in medical notes	As defined by the NCA team	Transfusion Practitioner with appropriate clinical member of staff

9.0 Training Needs and Competency Assessment

Any new staff member who is involved in the transfusion process must receive training on blood transfusion within 3 months of starting within the Trust and then every 3 years for the tasks they are involved in.

The transfusion process includes the prescription, request, collection, administration or handling of blood components and the management of any complications.

The table below states the training sessions provided by the Transfusion Practitioner within the trust for each staff group

Staff Group	Training Available	Frequency of Training
Health care assistant	2 hour training session	Quarterly
Nursing staff & theatre staff	1½ hour session on Trust IV study day. 20 minute session on IV update	Every month
Midwifery and paediatric staff	1 hour session on Maternity IV	Every 2 months
Midwifery staff	30 min session on Emergency Day	Every month
FY1	45 min session	Every 6 months
FY 2	45 min session	Every 6 months
Anaesthetist Trainees	1 hour session	Annually
Health care assistants Maternity care assistants	Short session (20 minutes) or 1:1 session	As required

Nursing staff Midwifery staff Theatre practitioners Student nurses	Short session (20 minutes) or 1:1 session	As required
Porters Health care assistants Maternity care assistants Nursing staff Midwifery staff Theatre practitioners Ward Clerks	1:1 practical session for collection of blood unit using blood tracking	As required

Competency Assessment

The National Patient Safety Agency[9], Safer Practice Notice 14 recommends that all staff involved in the transfusion process are competency assessed once every three years for the tasks they are involved in.
There are three competency assessments within the Trust relating to blood transfusion:

- Assessment 1: Taking a blood sample / venepuncture (Appendix B)
- Assessment 2: Collecting a blood unit (Appendix C)
- Assessment 3: Preparing and administering a blood transfusion (Appendix D)

Managers will be responsible for identifying the competencies that staff need to achieve and make arrangements for competency assessment.

Taking a blood sample / venepuncture
All staff will undertake training by Clinical Skills Trainers within the Trust. This will be followed by a period of observation within their clinical area. Assessment will be undertaken by the Clinical Skills Trainers or other agreed assessor within the Trust, usually the practice educator. The assessment is part of the Vascular Assess Network: Structured Learning Programme 2005.
Competency assessment forms will be held by the individual and competency assessment records by the Clinical Skills Trainers and phlebotomy supervisor.

Collecting a blood unit
Staff will be observed and then assessed by the Transfusion Practitioner or Senior Biomedical Scientist in the Transfusion Laboratory. Competency assessment forms will be held within the Transfusion Laboratory and competency records held on the blood track system.

Preparing and administering a blood transfusion
Staff will undertake training on the Intravenous study day by the Transfusion practitioner.
This will be followed by a period of observation within their clinical area. Assessment will be undertaken by an agreed assessor within the clinical area, usually the practice educator. Competency assessment forms will be held by the individual and competency assessment records by the practice educator and/or the Transfusion practitioner.

Reports on the number of staff competent in each assessment will be provided to the divisional matrons by the Transfusion Practitioner every year.

10.0 Consent for a Blood Transfusion

Whenever possible a trained and knowledgeable practitioner should obtain verbal consent from the patient (and /or for paediatric patients those with parental responsibility) following explanation of the risks, benefits and alternatives to transfusion. This should be done in a timely manner and in a way that they can understand.

Signed written consent by the patient is not, at present, a legal requirement within the UK, although it is good practice that agreement for transfusion is documented in the patient's clinical notes.

Where consent is not possible, e.g. in emergency situations, justifiable medical clinical judgement must be used. It must be documented in the patient's clinical notes.

Patients should be informed that they have received a blood transfusion prior to discharge. This is particularly important where the patient may not be aware of the transfusion (e.g. transfused during surgery or emergency situations).

Patient information leaflets (available in a wide range of languages) produced by the UK Blood Services are available in all clinical areas or from the Transfusion Practitioner on ext 8673. These should be given to the patient and / or relatives prior to a transfusion. Pre operative assessment or antenatal appointments are ideal times to give patients these leaflets.

Several different types of leaflet are available:-
"Will I need a Blood Transfusion" for adults (Appendix E)
"Children receiving a blood transfusion" this contains information leaflet for parents and two different leaflets aimed at different age groups of children.
"Babies receiving a blood transfusion: a parent's guide" for parents of neonates
"Receiving a plasma transfusion"
"Information for patients needing irradiated blood (Appendix E)

The Trust consent forms 1 'Patient agreement to investigation or treatment', and 2 'Parental agreement to investigation ro treatment for a child or young person', requires that blood transfusion is discussed if it is an extra procedure that may become necessary during the investigation or treatment. The discussion must include what the blood transfusion involves, the benefits and risks and any available alternative treatments, and any particular concerns of this patient.

11.0 Patients who Refuse a Transfusion

Patients should have a right to refuse blood transfusion following explanation of the risks and benefits.
If the patient or guardian refuses consent, the matter should be referred to a consultant for advice and medical staff must complete Consent Form 5 "Patient refusal to investigation or treatment including Blood Transfusion". This is available on the Trust Intranet.

For Jehovah's Witnesses refer to appendix F. They may also complete a Health-Care Advance Directive. This clearly states what blood components and/or blood products they will accept. A copy of this document should be obtained in the patient's medical notes.

12.0 Indications for Transfusion

There are no absolute thresholds for transfusion. The decision to transfuse remains a clinical decision. The patient's medical history, age and symptoms of anaemia need to be considered. The reason to transfuse should be documented in the clinical notes. Transfusions above the trigger Hb, should have documented symptoms of anaemia (palpitations, postural hypotension, angina) clearly stated in the clinical notes.

The amount of red cells to be transfused should take into account the patients medical condition and weight.
Each unit of red cells should increase haemoglobin level by 1.0 g/dl

Patient	Trigger Hb	Target Hb
Less than 65 years with no cardiac or respiratory disease	< 7.0	7.0
Over 65 years old with no cardiac or respiratory disease	< 8.0	9.0
History of cardiac disease or respiratory disease / bone marrow suppression	< 9.0	10.0

Appendix G gives more details on indications for red cell transfusion. Sections 25.0, 26.0 and 27.0 give the indications for use of platelets, Fresh Frozen Plasma and cryoprecipitate.

12.1 Single Unit Transfusion

There is nothing to support the view that the minimum 'dose' of a red cell transfusion for an adult is 2 units. The modern approach to red cell transfusion in patients without acute bleeding is to use conservative transfusion thresholds and to transfuse sufficient blood so that the patient's Haemoglobin exceeds the trigger but no more; this often means that a single unit is sufficient.

13.0 Request for Blood Components

The request for blood component for transfusion is different to the prescription.
The 'request' constitutes the mechanism of communication with the Transfusion Laboratory, asking them to prepare and issue a blood component for administration and is different to the prescription (Section 15.0)

Blood components must be requested from the Transfusion Laboratory on an individual named patient basis.

Medical staff will normally make requests for blood components using a blood request form. Although requesting of a blood component may be carried out by anyone in possession of the relevant information about the patient.

The requester should be clearly identified on the written request form or if a telephone request, it should be documented in the Transfusion Laboratory record.

The request

The details on the blood component request form and the sample tube are the only direct contact between the clinical area and the Transfusion Laboratory. The accuracy and completeness of this information is therefore of vital importance.

The request for a blood component may be on an approved written request form or telephoned – providing it contains the required information.

Where blood samples are sent to the Transfusion Laboratory for Group and Save or crossmatch the request should be written, even if preceded by an explanatory telephone call.

Telephoned requests are mainly where a Group and Save blood sample is already in the Transfusion Laboratory and it is being converted to a crossmatch or when requesting FFP or platelets in patients whose blood group has been determined by the Transfusion Laboratory. Request cards should not be used to request FFP and platelets. The verbal request should be documented by the Transfusion Laboratory and a robust system in place to ensure the accuracy of the request.

The request form must contain the following patient details. Addressograph labels should be used if available, otherwise clearly written details:-

- Last name
- First name
- Date of birth
- NHS number. If NHS number is not available, the Hospital number should be used. If neither of these are present the request will not be processed unless under exceptional clinical circumstances following discussion with the Transfusion Laboratory staff. The name of the clinical member of staff taking responsibility for the request should be documented.
- Gender

If the patient's identification is unable to be obtained and blood components need requesting. The request form must state "Unknown Male" or "Unknown Female" and have a unique hospital number.

The request form must contain the following clinical information about the patient:-

- Consultant
- Location of patient
- Where blood components are required (if different)
- Signature of doctor making the request and contact number
- Information on current diagnosis and any significant co-morbidities of relevance to transfusion
- A clear, unambiguous reason for transfusion "Low Hb", "anaemia" and "Pre-op" are not acceptable and provide inadequate information for audit purpose.
- Type of blood component required
- Number of units required. For surgical procedures the number of units must follow the Maximum Surgical Blood Ordering Schedule (Appendix H)
- Date and time blood component required
- Date and time of request

The request form should contain relevant information on other factors which influence transfusion requirements

- Known blood group antibodies
- Previous reactions to blood components
- Pregnancies
- Special requirements e.g. CMV-negative, Irradiated (Appendix I: Indications for Special Requirements)

Patients who require Irradiated blood components may carry a blue and red card with them that states “I am at risk of transfusion-associated graft-versus-host-disease. Must have Irradiated blood” (Appendix E). If a patient shows you this card, inform the Transfusion Laboratory immediately.

All urgent requests must be verbally communicated to the Transfusion Laboratory either on ext 7697 or bleep 298 if it is ‘out-of-hours’. ‘Out-of-hours’ is any time other than 09.00 – 17.30 Monday to Friday, or 09:00 – 13:00 Saturday.

During ‘out-of-hours’ if any blood component is required before 8.30 the following day, the Transfusion Laboratory must be contacted on bleep 298.

Verbal requests for blood components must contain the following information:-

- Core patient identifiers (last name, first name, DOB and NHS or Hospital number)
- Consultant
- Location of patient
- A clear, unambiguous reason for the blood component
- Type of blood component required
- Number of units required
- Date and time blood component required
- Name of requester

Clinicians are encouraged to discuss transfusion indications and requirements with the Transfusion Laboratory staff. Advice is also available from Transfusion practitioner and consultant haematologist when required.

14.0 Blood Sample Collection for Pre-Transfusion Compatibility Testing

Incorrect or inadequate patient identification may lead to ABO-incompatible transfusions. Errors due to poor patient identification have lead to a blood sample being taken from, or labelled for the wrong patient (SHOT).

Blood sample collection for pre-transfusion compatibility testing can be undertaken by anyone who has been trained and assessed as competent to perform the procedure.

All patients should, whenever possible, have a positive patient identification check. This means the patient is asked to state their last name, first name and date of birth. These details are checked against the sample request form and the patient’s identification band (or equivalent). If there is any discrepancy the sample should not be taken until the discrepancy is investigated.
In outpatient departments (or in the community setting) where identification bands may not be used, the patient (or carer/guardian if the patient is unable to respond) should be asked to state their last name, first name, date of birth and address. These details should be checked against the sample request form. If there is any discrepancy the sample should not be taken until the discrepancy is investigated.

For paediatric transfusions, when positively identifying the patient, it is acceptable to ask the child (if able to respond) and/or a parent/carer to verify the patient details in addition to checking the child’s identification band. In circumstances where the child cannot state their details and no parent/carer is available, the child’s identification band will be the only means of patient identification.

The collection of the blood sample from the patient into the sample tube, and labelling of the sample tube, should be performed as one continuous, uninterrupted event next to the patient.

Important factors about labelling on sample tube

- Sample tubes must not be pre-labelled with patient details
- Addressograph labels must not be used
- The sample tube must be labelled immediately after the blood has been added
- The sample tube must be labelled next to the patient
- Information must be hand-written using a ball point pen to avoid smudging
- Should be legible

Key elements to be stated on the sample tube

- Last name (exactly matching the request form and identification band)
- First name (exactly matching the request form and identification band)
- Date of birth (same as on the request form and identification band)
- Unique identification number: NHS number (Hospital number if no NHS number)
- Date and time sample taken
- Signature or initials of the person taking the sample

The person who took the blood sample must complete the following details on the request form

- Date the sample was taken
- Time the sample was taken
- Clearly state their name or initials

The Transfusion Laboratory will not process incorrect or incompletely labelled samples**.** If the sample is for a crossmatch the requester will be notified of the breach in procedure and the need for a repeat sample. This may delay patient's treatment.

The transfusion sample will be valid for 7 days unless the patient is transfused or pregnant. When a patient is transfused, the sample will be valid for 72 hours from the start of the transfusion.

When to take a Second Transfusion Sample

In July 2008 an audit showed 1 transfusion request per month was received, where the sample had been taken from the wrong patient. This could have resulted in 12 fatal transfusion reactions, through ABO incompatibility, annually.
With patient safety in mind the Hospital Transfusion Committee introduced the policy of requesting 2 transfusion samples, taken on **separate occasions**, prior to issuing blood components. This will alert the Transfusion Laboratory to samples taken from the wrong patient due to blood group discrepancies.

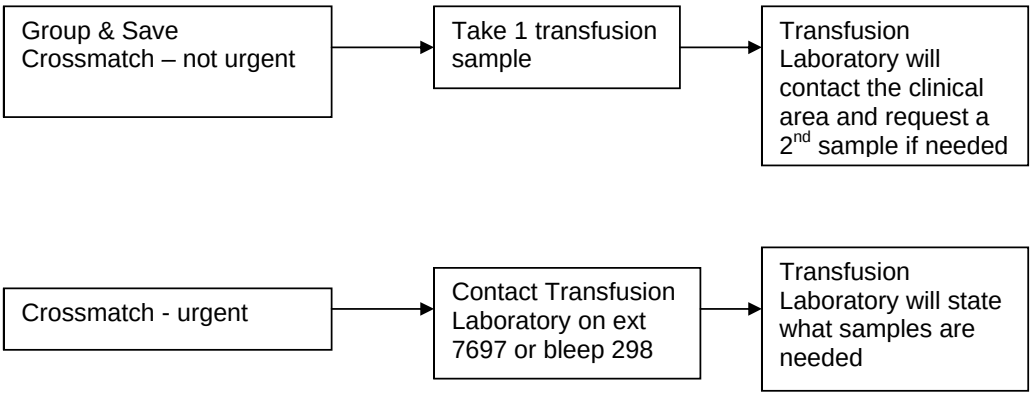
For the majority of patients the 2 transfusion samples relate to one current sample and a historic sample (this can be from days, months or years ago). Therefore the one taken on this admission is the only one required to issue blood components. To see if a patient has a historic blood group look on EPROA (pathology reports system).

It does not mean that patients need 2 transfusion samples taken before blood components are issued.

Staff should continue to take 1 transfusion sample, regardless whether for Group and Save or crossmatch.

For a crossmatch, or when a Group and Save is converted into crossmatch, the Transfusion Laboratory will request a second sample from the clinical area if required. If 2 transfusion samples are taken at the same time, only one of them will be processed.

For newly admitted patients who require blood components immediately the Transfusion Laboratory should be contacted on ext 7697 or bleep 298 and they will inform if 1 or 2 transfusion samples are required.



Timing of Crossmatch Sample

Once a patient has been transfused, the timing of a new transfusion sample is dependent on the previous transfusion**.**

Patient last Transfused	Crossmatch sample to be taken
Currently being transfused	72 hours after start of last transfusion
3 to 14 days	Within 24 hours of intended transfusion
14 to 28 days	Within 72 hours of intended transfusion
28 days to 3 months	Within 7 days of intended transfusion

Delivering samples to the Transfusion Laboratory

Samples that are not urgent should be placed at the allocated collection site in the clinical area for collection or placed in the 'air-tube' system.

If the sample is urgent the Transfusion Laboratory staff must be contacted to alert them that a sample is coming. They will inform the clinical staff, as to the most appropriate way to deliver the sample to the laboratory. If the Transfusion Laboratory staff are aware that an urgent sample is in transit, they can make further enquiries if they do not receive it.

15.0 Prescription of Blood Components

The prescription of blood components is different to the request. It constitutes the instruction to administer the blood component.

Ideally, to prevent communication or transcription errors, blood components should be prescribed by the medical staff making the decision to transfuse.

The prescription of blood is the responsibility of the medical staff, and whilst the administration of blood may be life saving, transfusion is not without risk. Clinicians prescribing blood components should be aware of the appropriate indications and the risks and benefits of the blood component. Good transfusion practice implies that all efforts are taken to prevent or pre-empt the need to transfuse.

All blood components should be prescribed on a "Blood Transfusion Care Pathway". These are available in all clinical areas (Appendix J).

There are several different versions available. The correct version should be used:-
In-patient
Out patient
Paediatric In-patient
Paediatric Out-patient
ICU Blood Component Transfusion Record
Buscot Neonatal Unit Blood Component Transfusion Record

The prescription should include the following:-

- Patient core identifiers (Last name, first name, date of birth and NHS number. If NHS number is not available, then Hospital number should be used)

- Date the transfusion is required
- Type of blood component required
- Volume or number of units to be transfused (exact volume in mls for paediatrics)
- Rate or duration for each unit to be transfused
- Special blood instructions: Yes or No. If yes, these should be stated on the care pathway e.g. CMV-negative, Irradiated (Appendix I)
- Any medication to be administered before or during transfusion
- Signature of the registered practitioner

Transfusion rate of blood components

Component	Adult administration rate per unit	Paediatric administration rate
Red Cell	Maximum 3 hours No more than 4 hours	5ml/kg/hr No more than 4 hours
Platelets	No more than 30 minutes	10-20 ml/kg/hr
Fresh Frozen Plasma	No more than 30 minutes	10-20 ml/kg/hr
Cryoprecipitate (5 donor pool)	Given stat No more than 1 hour	10-20 ml/kg/hr

Transfusion of a unit of red cells should be completed within 4 hours of removal from designated blood fridge[10]. This limit is designed to reduce risk of bacterial growth and transfusion-transmitted infection. Therefore a unit of red cells should have a maximum prescription rate of 3 hours. A unit of red cells can be administered safely over 2 hours, in a patient who does not have any underlying heart or renal problems.

Units of red cells should not be prescribed with a variable rate e.g. 2-3 hours.

A pool of platelets should be prescribed over 30 minutes

A unit of FFP should be prescribed over 20 or 30 minutes

A unit of cryoprecipitate (5 donor pool) should be prescribed over 30 minutes

16.0 Patient Preparation / Pre Collection Checks

Prior to collection of a blood component the following checks should be undertaken. This prevents delays in transfusion and blood components being wasted.

- Patient has given consent for the blood transfusion.
- Patient has received written information about receiving a blood transfusion.
- The blood component has been prescribed.
- An identification band or equivalent in place. It must contain core patient identifiers (last name, first name, date of birth and unique NHS number). Haemodialysis unit and paediatric areas use identification badges on their patients.
- Appropriate intravenous access available.
- The blood component is ready for collection. This can be achieved by accessing the Pathology system (EPROA). It should not be necessary to telephone the Transfusion Laboratory to determine the availability of red cells for routine transfusion.
- The patient's temperature is taken. A patient with a temperature above 37 °C can receive a transfusion. Medical staff should determine if the transfusion can be

postponed until the temperature has returned to within normal limits or if the transfusion needs to be administered immediately.
- Suitably trained and competent staff are available for the duration of the transfusion and observations will be able to be undertaken at 15 minutes after the unit has started.
- A pump is available for administration.
- Drugs for the treatment of anaphylactic shock must be available on the resuscitation trolley.

17.0 Collection and Delivery of Blood Components to Clinical Area

Withdrawal of blood components from their storage location continues to be identified as a major source of error in the transfusion process (SHOT). Most errors occur when the patient details on the blood component label are not checked against written core patient's identifiers.

Collection of red cells from blood fridges can be undertaken by anyone who has been trained and assessed as competent to perform the procedure.

Whenever possible it is the responsibility of the clinical staff to collect red cell units from the blood fridge.

There are 4 blood fridges within the Trust. Clinical location on the request card is used to allocate the red cells into the most appropriate fridge (Appendix K).

Only one unit of red cells must be collected at a time unless the patient is having haemodialysis or having a major haemorrhage.

When more than one unit of red cells is removed a time, they should be transported in a cooler box with a cooler pack. White cooler boxes are used for all clinical areas except theatres, where small red cooler boxes are used.

The unit of red cells must be delivered to the clinical area without delay.

Patient identification required for collection

The staff member removing the blood component from the blood fridge, Transfusion Laboratory or other controlled storage location should have documentation with patient's core identifiers (last name, first name, date of birth and NHS number). These details will be checked against the Transfusion Laboratory generated "red" label on the unit. (Appendix L).

The documentation can be:-
- Blood transfusion care pathway
- Blood collection slip (Appendix M)
- Patient addressograph label

Other details required are:-
- Location of the patient
- Degree of urgency the blood component is required

A telephone and collection slips are available at each blood fridge location for obtaining patients core identifiers prior to collection.

Maintaining cold chain between blood fridge

Blood Quality and Safety Regulations require that for all blood components the "cold chain" must be maintained and the relevant documentation be available.

The Trust is using an IT system called "Blood Track" for putting in and removal of red cells from a blood fridge.

For each unit put in or removed from the blood fridge, the system retains:-

- Person ID who performed the transaction
- Date and time of the transaction

Collection of red cell unit from blood fridge

Only members of staff assessed as competent and issued with a bar code can collect units of red cells from a blood fridge.

The process for collecting a unit of blood is as follows:-

- Member of staff collecting unit identifies themselves with the use of their barcode at the blood track kiosk
- Select "Taking Out"
- Select "By hand" or "By Cooler"

The blood fridge door will now be unlocked. The required unit of red cells can be removed.

- Patient's core identifiers (last name, first name, date of birth and NHS number) on the red Transfusion Laboratory label should be checked against the documentation (blood transfusion care pathway, blood collection slip or addressograph label) that was brought to the fridge.
- If all patient core identifiers match, then scan the unit of blood at the blood track kiosk
- If all patient core identifiers do not match, then place unit back into the blood fridge and inform the Transfusion Laboratory immediately
- Once unit has been scanned the patient's details will appear on the screen
- All patient's core identifiers (last name, first name, date of birth and unique hospital number) on the Transfusion Laboratory generated "red" label should be checked against those on the screen.
- If all patient's core identifiers are correct, select "Yes"
- If the unit has been within correct storage conditions a green screen will appear with an "OK" message will appear. This indicates that the unit is in safe to take to the clinical area.
- Select "Done" and take unit to clinical area immediately with the documentation used to collect the unit of blood.
- If all patient details are not correct, select "No". Place the unit back into the fridge and inform the Transfusion Laboratory immediately.

If the unit has not been within correct storage conditions a red screen will appear with
A message "Contact blood bank for advice". The unit should not be taken to the clinical area but placed back into the fridge and Transfusion Laboratory contacted immediately on ext 7697 or bleep 298. The laboratory staff will inform you on the next action required.

Receipt at clinical area for red cell units

This only needs to be documented if a unit of blood is delivered to a clinical area by a member of portering staff or any other member of staff using a collection slip.

A member of clinical staff should receive the unit of blood and complete the collection slip with the following details:-

- Member of staff who received the unit
- Date and time the unit was received in the clinical area

The collection slip is then taken by portering staff to either the Transfusion Laboratory or the portering lodge for collection by Transfusion Laboratory the next day.

Return of red cell units to blood fridge

Only members of staff assessed as competent and issued with a bar code can return units of red cells to a blood fridge.
This process is used if a unit of red cells is being returned from a clinical area or being transported from one blood fridge to another blood fridge.

The process for returning a unit (s) of blood is as follows:-

- Member of staff returning or transporting the unit identifies themselves with the use of their barcode at the blood track kiosk
- Select “Putting In”

The blood fridge door will now be unlocked.

- Scan the unit (s) of red cells at the blood track kiosk
- If the unit is within the transport time a green screen will appear with a “OK” message for each unit
- Place the unit (s) into the fridge.
- Select “Done”

If the transport time has been exceeded a red screen will appear, with a message “contact blood bank for advice”. The unit (s) should be placed into the fridge and the Transfusion Laboratory contacted immediately on ext 7697 or bleep 298. The Transfusion Laboratory will inform you of the next action required.

The maximum transportation time for a unit of red cells is 30 minutes if it has been transported by hand and 2 hours if it has been transported in a cooler box.
Units that exceed transport time can be transfused to patients as long as the unit is completed within 4 hours from the time it was removed from a blood fridge.

Return of other blood components

All unused components should be returned to the Transfusion Laboratory as soon as possible, with an explanation from the clinical area of the circumstances of the return.

Collection of emergency unit of red cell unit from blood fridge

In certain emergency situations it may be necessary to provide red cell units that have been unmatched and not labelled for a specific patient. These are referred to as "emergency O negative units". Contact the Transfusion Laboratory before taking these units as red cell units for the patient may already be available.

The location of emergency O negative units within the trust is shown below

Fridge location	Number of Adult units	Number of Paediatric units
Southwing Fridge	2	0
Maternity Fridge	2	2

They are clearly labelled with red stickers stating "Emergency O neg Blood".

The Transfusion Laboratory must be informed immediately of the removal of any emergency unit from the blood fridge on ext 7697 or bleep 298. This enables the Transfusion Laboratory to make a record of which patient has received the emergency O negative unit(s) and to ensure rapid replacement of the unit(s) so that future demands are not compromised.

Storage conditions and transport requirements for Emergency O negative units are the same as for any other unit of red cells.

Once the Emergency O negative units have been transfused to a patient the red label on the unit should be completed with core patient identifiers (last name, first name, date of birth and NHS number) as well as date and time of transfusion and returned to the Transfusion Laboratory.

Red cell units delivered from another hospital

Contact Transfusion Laboratory on ext 7697 or bleep 298 (out of hours) and inform them of the number of units and patient details. They will advise if the units are safe to transfuse. If the units are not going to be administered they should be returned to the Transfusion Laboratory immediately.

Blood components to be transferred to another hospital

Contact Transfusion Laboratory on ext 7697 or bleep 298 (out of hours) who will pack the appropriate number of blood components in the correct box.

All the red cell units must be packed in a blood transport box together with a cold pack. Transfusion Laboratory staff will complete documentation. This states the date, time and signature of the person who packed up the units.

Platelets must be packed in a blood transport box together with a 22° C pack.

18.0 Administration of Blood Components

Failure to correctly undertake the final administration check correctly puts the patient at risk of receiving the wrong blood component[1].

The final administration check consists of confirming that the right patient is going to receive the right blood at the right time, and that the component is suitable for transfusion to that particular patient.

An overwhelming number of transfusion deaths are associated with errors when a blood component is being administered.

It is best practice to commence the final administration check immediately the blood component is received in the clinical area.
The final administration check must be conducted next to the patient. Do not perform these checks in a remote clinical room or at the nursing station.

A transfusion must only take place when there is enough staff available to monitor the patient and observations can be taken at 15 minutes after the start of a unit. Overnight transfusions should be avoided unless clinically essential.

The person who is going to administer the unit should do all the checks.

If an interruption occurs throughout the checking process, the whole process should re-start from the beginning.

Once all the administration checks have been completed the unit should be commenced immediately.

Persons who can undertake the administration check

A systematic review[11] has found no unequivocal evidence to support either a one or two person checking procedure. As a minimum, one registered healthcare professional (trained and competency assessed) must perform the final administration check.

Final administration check can be undertaken by anyone who has been trained and assessed as competent to perform the procedure.

One person may perform the final check if they have been assessed as competent and the ward or department sister/charge nurse is in agreement. The person must be a:

- Registered nurse
- Registered midwife
- Medical staff
- Theatre practitioner

If two persons perform the final check, the first person must have been assessed as competent and be a

- Registered nurse
- Registered midwife
- Medical staff
- Theatre practitioner

The second person can be a registered nurse, registered midwife, theatre practitioner or medical staff who has not been assessed as competent to administer blood components.

If two persons perform the final administration check, each person should complete all checks independently (double independent checking).

Final Administration Check: The Process

The final administration check must be performed at the patient's side. The following table states all the checks that need be made at prior to administration. It is divided into patient checks and blood component checks.

Prior to starting the final administration check the following should be together:-

- The patient
- Identification band (or equivalent) with last name, first name, date of birth and NHS number
- Prescription of blood component i.e. blood transfusion care pathway (Appendix J)
- Unit of blood component with laboratory generated "red" label attached (Appendix L)

Final Administration Check: The Process

Patient Checks
Ask the patient to state their full name (first and last name) and date of birth (DOB).
If patient unable to state full name and DOB, verification can be obtained from relative or carer if present. In circumstances where the patient cannot state their details and no relative/carer is present, the patient's identification band will be the only means of identification
The verbal response (full name and DOB) stated by patient is the same as on the patients identification band or equivalent. This includes checking the spelling of the full name is the same as the verbal response and identification band or equivalent.
All details on the patient's identification band or equivalent (full name, date of birth and NHS number) are the same on the blood transfusion care pathway
All details on the patients identification band or equivalent (full name, date of birth and NHS number) are the same as on the laboratory generated "red" label attached to the blood component pack
Blood Component Checks
The expiry date of the blood component pack label (unless a specific expiry time is stated). The component expires at midnight of the date shown
The unique component donation number on the blood component pack label is the same as on the laboratory generated "red" label attached to the blood component
The blood group on the blood component pack label is the same as on the laboratory generated "red" label attached to the blood component
Check the blood component pack label for any special requirements that are stated on the blood transfusion care pathway e.g. irradiated, CMV negative
Inspect the blood component pack for any signs of leakage or damaged packaging
Inspect the blood component for unusual colour or clumping of the contents. If any defect is suspected contact the blood Transfusion Laboratory for advice prior to commencing the transfusion

If there is any discrepancy with patient details or blood component details the unit must not be administered and the Transfusion Laboratory should be contacted on ext 7697 or bleep 298. The discrepancy should be reported as a near miss clinical incident. This can be done by completing an incident reporting form or by contacting the transfusion practitioner on ext 8673 / pager 40164, who will complete the incident reporting form.

The staff member can contact the Transfusion Laboratory if they are unsure at any point during the final administration check that the blood component issued for the patient is correct, for example an unexplained difference between blood groups in the patient and blood component or whether special requirements have been met.

Start the transfusion as soon as possible after delivery and immediately after the final administration check.

If two members of staff perform the final check, the first person is responsible for initiating the transfusion of that unit.

If a unit of red cells is not administered immediately, it can be retained in the clinical area and transfused at a later time. The unit must be completed within 4 hours of removal from the blood fridge. If the unit is not completed within 4 hours, the unit should be disconnected and disposed of in a clinical waste bin.

Administration Equipment

All blood components should only be transfused through a sterile blood administration set with integral mesh filter (170 – 200 micron).

Priming of the administration set is not required. However, if priming of the administration line is thought necessary, only isotonic (0.9%) saline should be used.

Red cells should be administered using an electronic infusion device if possible.

Wash hands and utilise a no-touch technique for the connection of the administration line. Non-sterile gloves and apron should be worn.

Blood components must not be mixed within the same administration set. If a second blood component is to be transfused, isotonic (0.9%) saline should be used to flush the administration set between components.

During red cell administrations the administration set should be changed every 12 hours. This is intended to reduce the risk of bacterial growth occurring.

Blood components must never be stored in a drug fridge or domestic fridge.

Under no circumstances should drugs be directly added to any blood component. However, opioid analgesia delivered by PCA may be safely administered in the same intravenous line as red cells[12].

External pressure devices can be used to administer a unit of red cells within minutes. They should only be used in an emergency situation and should never exceed 300 mmHg.

Transfusion at night

In its 2005 report, SHOT[1] recommendation 4, advises avoiding blood transfusions overnight. It states that "available data indicate that blood administration and pre-transfusion testing overnight are less safe and should be avoided unless clinically essential. Clinically essential refers to acute bleeding or low haemoglobin with symptoms.
However, it is recognised that in practice transfusions overnight (started between 20:00 and 08:00) do occur for reasons that may not be deemed clinically essential, but are nonetheless acceptable always provided that patient safety is paramount.

If transfusions are occurring overnight then clinical staff should undertake the same observations of the patient as during a daytime transfusion as stated in section 20.0 Monitoring of the patient during transfusion.

19.0 Documentation of Blood Transfusion Administration

Blood Safety and Quality Regulations state that a blood component should be traced from donor to recipient. This information should be available for 30 years. Therefore, the minimal information should be documented for each blood component administered.

- The donor unit number
- The date unit was transfused
- Start time of the unit
- Volume of blood component
- Names and signatures of the staff performing the final administration check
- The end time of the unit
- Observations undertaken during the transfusion of the unit

The Transfusion Laboratory generated "red" label and the blood transfusion care pathway allow for the documentation of these requirements.

The blood transfusion care pathway should be present throughout the transfusion.

The blood transfusion care pathway should be filed permanently in the patient's clinical record once the transfusion episode is completed.

As soon as the unit has commenced, both sides of the Transfusion Laboratory generated "red" label should be completed.

The sticker should be detached and placed on the blood transfusion care pathway or transfusion component documentation sheet. This includes

- Date unit was administered
- Start time of the unit
- End time of the unit
- Signature of person(s) who have/has undertaken the final administration check

The other side of the label should be detached, placed in the clear plastic bag the unit arrived in and sent back to the Transfusion Laboratory using the pathology specimen route. This can be using the portering system or via the air tube system.

20.0 Monitoring of the Patient during Transfusion

Monitoring of the patient during a transfusion is essential if serious reactions to the transfusion are to be identified and managed (Appendix N). The majority of serious reactions are apparent within the first 15 minutes and monitoring during this period is vital.

Blood components should be commenced when observation of the patient is maximised.
A patient is at increased risk when being transfused overnight because there are likely to be fewer nurses to monitor the patient as well as fewer medical and laboratory staff available should a complication occur. Monitoring the patient at night may be more difficult than in the day time because of reduced lighting. However, if there is an acute clinical need for transfusion, then that risk may be more acceptable than in cases where the need is not so acute. Visual observation and recording of observations of these patients is crucial.

Commencing a unit just prior to hand-over also has potential for increasing risk due to reduced numbers of staff to observe.

The recommended minimum transfusion observations, for both adult and paediatric patients, for **each unit** of blood component transfused are:

- **Pre transfusion;** temperature, pulse and blood pressure should be recorded no more than 60 minutes before commencement of the component.

- **15 minutes after the commencement of unit;** temperature, pulse and blood pressure should be recorded.

- **End of each unit;** temperature, pulse and blood pressure should be recorded within 60 minutes of the unit finishing.

If the transfusion has been prescribed on a blood transfusion care pathway or ICU / neonatal blood component transfusion record, the observations should also be recorded on the same document.

Further observations during the transfusion of each unit of blood component are at the discretion of each clinical area and should be taken if the patient shows signs of being unwell or signs of a transfusion reaction. These include:-

- Fever, shivers
- Feeling agitated, restless
- Flushing
- Pain in back, abdomen
- Shortness of breath
- Rash, itching
- Changes in skin colour
- Haemoglobinuria

Deterioration in the patient's condition, or suspected transfusion reactions should prompt more frequent observations as dictated by the clinical situations.

Special care should be taken in patients who are unable to complain of symptoms that would raise suspicion of developing transfusion reaction, because they are unconscious, too young or confused. These groups of patients are also unable to positively identify themselves, and are at particular risk of adverse reactions.

The patient should be informed of any potential adverse effects and asked to report them.

Visual observation of the patient is the best way of assessing the patient during transfusion. Transfusions should be undertaken in clinical areas where members of the clinical staff may readily observe patients.

All severe transfusion reactions must be reported to a consultant haematologist (bleep via switch board) and either the transfusion practitioner (ext 8673 / page 40164) or Transfusion Laboratory (ext 7697 or bleep 298). The transfusion practitioner will complete a transfusion reaction form (Appendix O) and report the incident to the necessary national reporting body.

21.0 Completion of a Transfusion

The patients observations (temperature, pulse and blood pressure) should be documented on completion of each unit, on the blood transfusion care pathway. The observations should be undertaken within an hour of the unit being completed.

The finish time of the unit should be completed onto the sticker from the “red” label which is on the blood transfusion care pathway or blood component transfusion record.

The empty blood component bag should be discarded into a clinical waste bag. Prior to discarding, check that the Transfusion Laboratory generated “red” label has had:-

- The sticker detached, completed and placed on the transfusion care pathway/ blood component transfusion record or blood transfusion documentation sheet
- The detachable part of the red label is completed and sent back to the Transfusion Laboratory.

This will ensure compliance with the Blood Safety and Quality Regulations (2005)[3].

If a further blood component unit is prescribed, repeat the collection, final administration check and monitoring processes for each unit.

If no further units are prescribed, remove the blood administration set. If any other intravenous fluids are prescribed, they should be administered through a new giving set.

Completion of a Transfusion Episode

A permanent record of the transfusion of the blood components should be kept in the patients clinical records including whether or not the transfusion achieved the desired effect (either post transfusion increments or improvement in patients symptoms).

The blood transfusion care pathway / blood component transfusion record should be filed in the patients clinical notes. It should contain the following information:

- The prescription of the blood components
- The patients observations during the transfusion episode
- The start and finish time for each unit
- Donor unit number of each unit

22.0 Management of Major Haemorrhage

A major haemorrhage is defined as “a patient losing their whole blood volume within a twenty-four period or fifty per cent of their blood volume within three hours”. However, it is unlikely that interventions to prevent bleeding and replace blood loss would not be undertaken before this situation is reached.

Initiation of major haemorrhage policy

If a patient has lost a considerable amount of blood and has signs and symptoms of shock, any member of medical staff can initiate the major haemorrhage policy by contacting the Transfusion Laboratory on ext 7697 or on bleep 298 if it is ‘out-of-hours’ (Out-of-hours is anytime other than 09:00 - 17:30 Monday to Friday, or 09:00 – 13:00 Saturday). The request does not have to go through the consultant haematologist.

Medical staff must give the Transfusion Laboratory the following information:-

- The name of the person declaring the major haemorrhage
- The patient’s last name, first name, date of birth, NHS number or hospital number
- If patients identity is unknown give gender and unique hospital number
- The location of patient (If the patient is about to be transferred to a different location, provide the location of where the blood will be needed)
- Designated contact person and number for duration of major haemorrhage
- Number of Red blood cells required
- Special requirements e.g. CMV-negative, Irradiated (Appendix I)

The major haemorrhage policy will then be initiated and 4 units of FFP automatically thawed for the patient. Appendix M shows the actions required by the clinical staff during a major haemorrhage.

Blood samples required prior to administration of blood components

A number of blood samples are needed to determine the most suitable blood component to be transfused to the patient. The Transfusion Laboratory will remind clinicians to take these samples as they initiate the major haemorrhage policy and start to thaw the units of fresh frozen plasma (FFP). Thawing and issuing of the FFP will take 40 minutes.

- Transfusion sample: Must be taken before administration of Emergency O negative red cells if valid sample not already in the Transfusion Laboratory
- FBC: For haemoglobin and platelet count
- INR, APTR and Fibrinogen. Fibrinogen needs to be written on the bottom of the request card

Issuing of blood components

The Transfusion Laboratory will liaise with haematology regarding results of the blood samples taken (FBC, INR, APTR and fibrinogen). Once the results are known the Transfusion Laboratory will issue the blood components that are required and inform the clinical area accordingly.

At the Transfusion Laboratory’s discretion, non crossmatched ABO compatible red cells will be issued during a major haemorrhage.

If the Fibrinogen is less than 100mg/dl. **Cryoprecipitate will be issued**.
2 large packs will be issued. It contains important clotting factors in much higher concentrations than fresh frozen plasma (FFP). Cryoprecipitate takes 30 minutes to thaw. It needs to be given immediately otherwise the clotting factors are deactivated

If the platelet count is less than 50 x 10^9. **Platelets will be issued**
One adult therapeutic dose (a pool) will be issued. It needs to be given immediately otherwise the platelets will aggregate in the bag and are unsuitable for transfusion

30 minutes after administration of these components a FBC, INR, APTR and fibrinogen should be repeated. If results are still abnormal further blood component will be issued. Clinical staff should contact the consultant haematologist for advice.

Use of Emergency O negative red cells

1. Emergency O negative red cell units must only be used when blood is required immediately under the direction of medical staff and following discussion with the Transfusion Laboratory.

2. Contact the Transfusion Laboratory before using the emergency O negative units on ext 7697 or bleep 298 (out of hours) stating the patients last name, first name, date of birth NHS number and location of the patient (and the blood fridge that the units are being removed from). If the patients identity is unknown state gender and unique hospital number.

3. They are clearly labelled as “Emergency O neg” and are located in blood fridges throughout the Trust.

Fridge location	Number of Adult units	Number of Paediatric units
Southwing Fridge	2	0
Maternity Fridge	2	2

4. Blood samples for transfusion, FBC and INR, APTR and fibrinogen must be taken prior to administration of Emergency O negative red cell units.

5. After administration of Emergency O negative red cell units it is essential that the completed red label is returned to the Transfusion Laboratory either by air tube system or portering staff. The red label must state the full patient’s details as well as the date, time and signature of the person who administered the unit. They must not be sent back in internal mail.

Collection of red cells for patient with major haemorrhage

More than 2 units of red cells taken to a clinical area for one patient at the same time must be packed up correctly. Communication between clinical area and Transfusion Laboratory is paramount during these situations. Clinical staff must contact Transfusion Laboratory at the same time as sending the porter to collect the units so that blood stocks can be managed and red cell units packed as necessary.

The procedure will depend on the day and time of the major haemorrhage and the location of the patient. The units will be placed with a cooler pack either in a small red box or white cooler box. They can remain in either the red box or white cooler box for 2 hours.

Location	Day & Time	Porters collecting & box type
South Wing Theatre	Monday – Friday, 8:00 a.m. – 10:00 p.m.	Theatre porters: red box
South Wing Theatre	Monday – Friday,10:00 p.m. – 08:00 am Weekends and Bank Holidays	General porters: red box
Central Theatre	Monday – Friday 8:00 a.m. – 10:00 p.m.	Theatre porters: red box
Maternity Theatre	Any day and time	General porters: white box
A&E	Any day and time	A&E porters: white box
Delivery Suite	Any day and time	General porters: white box

Units sent to Maternity Theatre or Delivery Suite in a white cooler box must be transferred immediately into the blood fridge on Delivery Suite.
These units will be removed from the blood fridge by the normal procedure. See section 17.0 Collection and Delivery of Blood Component.

Storage of red cell units in theatres

It is the responsibility of the theatre staff to ensure that red cell units are stored correctly before use and returned to the Transfusion Laboratory if not required. A complete audit trail is required. If a unit has been out of a blood fridge or cooler box for more than 30 minutes and is not going to be transfused imminently it will be discarded. If the whereabouts of the unit is unknown, or amount of time out of correct storage is unknown, the unit will be discarded.

If some of the red cell units within the cooler box have not been used within 1 hours of arriving in theatre then one of the following must be done.

- Remove units from cooler box and place in South Wing Theatre fridge via the blood track system.
- Give unused units in cooler box to porter to return to the Transfusion Laboratory or place in the South Wing blood fridge via the blood track system.

Collection of other blood components for patient with major haemorrhage

The porter responsible for red cell collection as stated in the table above is also responsible for collection of all blood components required. These include platelets, fresh frozen plasma and cryoprecipitate. They are all collected directly from the Transfusion Laboratory and delivered to the clinical area immediately.

Documentation of blood components during major haemorrhage

A blood transfusion care pathway is not practical during a major haemorrhage for documenting blood components transfused.

All red stickers from all blood components used during a major haemorrhage should be placed on a Blood Transfusion Documentation Sheet for use in Major Haemorrhage. (Appendix Q). One will also be issued by the Transfusion Laboratory with the first 4 units of FFP issued during a major haemorrhage. They are also available in A&E, on Delivery Suite, in Emergency Theatres, Maternity Theatres and central theatres.

23.0 Use of Recombinant Factor VIIa

A vial of recombinant factor VIIa (rVIIa) is stored in the Transfusion Laboratory for use during major haemorrhage. It will only be issued following discussion with consultant haematologist.

Use of Factor VIIa is for severe ongoing haemorrhage e.g. from multiple sites, particularly bleeding from large raw areas, despite attempting local control measures, or continued brisk blood loss (>200mL/hr) despite optimum conventional pharmacological and blood product support.

In particular attempts must be made to raise the fibrinogen level to >1g/L and platelets > $20x10^9$/L before rFVIIa use

Administration

- On going conventional treatment of coagulopathy with FFP and platelets and cryoprecipitate are essential.
- Hypovolaemia, Acidaemia and hypothermia should be corrected as far as possible.
- Ensure that full coagulation screen, fibrinogen and platelet count are in progress at every stage.
- rFVIIa 90 µg/kg by intravenous bolus injection over 2 – 5 minutes directly into vein (Do *not* mix with infusion solutions or give in a drip).
- This may be repeated after 2 hours, following further consultation, if bleeding continues and there was a positive response to the initial dose.
- Response should be assessed on clinical grounds, measured reduction or cessation of haemorrhage and blood component support pre/post rFVIIa administration

Contra-indications

Risk of thromboembolism: avoid in micro-vascular surgery and patients with severe vascular disease.
Use with caution if evidence of established disseminated intravascular coagulation.
Allergy to mouse, hamster or bovine proteins.

The Hospital Transfusion Committee, via the Transfusion Practitioner, will monitor the use of rVIIa.

24.0 Use of Prothrombin Complex Concentrate

Vials of Prothrombin Complex Concentrate (PCC) are stored in the Transfusion Laboratory. It will only be issued following discussion with consultant haematologist.

PCC is used to reverse oral anticoagulation when there is life-threatening bleeding, or haemorrhage threatening limb viability or sight. This includes cerebral haemorrhage, intraocular haemorrhage, retroperitoneal haemorrhage, muscle bleed with compartment syndrome, uncompensated bleeding with developing shock, or prior to emergency surgery with high risk of bleeding.

For suspected intracranial bleed, obtain urgent CT scan prior to administration of PCC to confirm bleed rather than infarct.

5mg iv vitamin K should be given with the PCC for sustained reversal of anticoagulant.

Suggested doses of PCC are :

15u/kg where INR <5
30u/kg where INR >5
50u/kg when intracerebral bleed

The Hospital Transfusion Committee / Transfusion Practitioner will monitor the use of PCC.

25.0 Guideline for Use of Platelets

Platelets are indicated for the prevention and treatment of haemorrhage in patients with thrombocytopenia or platelet function defects. The cause of the thrombocytopenia should be established before a decision about the use of platelet transfusions is made.

Indications for use

- Bone Marrow Failure caused by disease, cytotoxic therapy or irradiation.
  Active bleeding may occur when platelet count below 20 x 10^9/L
  Prophylactic transfusions to keep platelet count above 10 x 10^9/L in stable patients and above 20 x 10^9/L if infected patient

- Major Haemorrhage: Significant dilution thrombocytopenia only occurs with transfusion of more than 1.5 times the blood volume (approximately 12 units of red cells). The platelet count should be maintained above 50 x 10^9/L

- Acute disseminated intravascular coagulation (DIC), where there is bleeding associated with thrombocytopenia. Keep platelet count above 50 x 10^9/L

- Any condition that decreases platelets e.g. HELLP. Keep platelet count above 50 x 10^9/L

- Prophylaxis for surgery: For lumbar puncture, epidural anaesthesia, insertion of indwelling lines, liver biopsy, laparotomy or similar procedures, the platelet count should be raised to at least 50 x 10^9/L

Platelets not indicated

- Idiopathic thrombocytopenic purpura (ITP) unless life threatening haemorrhage
- Thrombotic thrombocytopenic purpura (TTP)
- Chronic DIC (Disseminated intravascular coagulation)

Dose

Initial dose is 1 ATD (adult therapeutic dose) obtained by apheresis or pool of 4-5 single donations. Subsequent doses must be dependent on laboratory results and patients clinical response. This may vary from 1 ATD every 2-3 days to up to 4 ATD per day.

Blood Tests

Prior to first administration of platelets blood samples should be taken for: -

- Group & Save
- FBC
- INR, APTR and Fibrinogen
- Patients likely to require prolonged platelet support need HLA typing and HLA antibody screening at diagnosis.

Prior to subsequent administration of platelets blood samples should be taken for:-

- FBC
- HLA antibodies if a patient has had 2 ABO compatible platelet transfusions with failed increment

ABO and Rh D compatibility

Platelets should ideally be ABO and Rh identical with the patient. However platelets of another ABO group may be administered if correct ABO group is unavailable.
Platelets contain a very small number of red cells so the Rhesus group should be matched to avoid sensitisation. If Rhesus positive platelets are given to a Rhesus negative patient 250iu of anti-D should be administered (which may be given subcutaneously in thrombocytopenic patients). This will cover 5 adult therapeutic doses of platelets in a 6 week period.

Special requirements

Platelets may need to be CMV-negative or irradiated (Appendix I). Patients who have HLA antibodies or are refractory to random platelets may require HLA selected platelets.

How to request platelets

As platelets are used infrequently and only have a 5-day shelf life they are not kept in stock in the Transfusion Laboratory. There is a delivery by the National Blood Service at 14:30 Monday to Friday. Therefore requests should be made by 16:00 hrs on the preceding day if possible. If platelets are required before 14:30, they should be ordered 48 hours in advance. Transfusion Laboratory can add a small amount of additional orders to the NBS by 09:30 am each day, if platelets are required for a patient for that day. Weekend requests must be made by Friday 09:30 am. Platelets for administration on Monday should not be requested on Friday.

All requests must go through the Transfusion Laboratory. The request should be verbal (see section 13.0) or written using a platelet fax. The following information must be given:-

- Full patient details
- Full requester details
- Reason for the transfusion
- Current platelet count

If the request is one that is indicated in these guidelines platelets can issued directly. If the request is one that is not indicated in these guidelines or BMS is unhappy with the situation the patient needs to be discussed with the Consultant Haematologist on-call.

One pool of platelets is available for emergency use throughout the whole Trust.

Collection

Platelets are collected directly from the Transfusion Laboratory by clinical staff or portering staff. All must be delivered immediately to the clinical area.

Administration

A copy of the administration information stated below will be sent to the clinical area with the platelets.

1. Platelets must be administered immediately after being delivered to the clinical area. If they are left on a flat surface they will start to aggregate in the bag and be of no benefit to the patient.

2. Never place platelets in a blood fridge, drug or domestic fridge

3. Patient must be wearing an identification band (or equivalent) during administration with full name, date of birth and NHS number clearly stated on it.

4. Administer each pool of platelets over 30 minutes. Can be administered quicker if indicated by patients clinical situation

5. Administer through a sterile blood administration set with integral mesh filter (170 – 200 micron).

6. Do not mix with any other blood component or fluid

7. Record Temperature, Pulse and Blood Pressure before, at 15 minutes and at end of each pool

8. Perform final administration check at the patient's side as per section 18.0 :-
   Check last name, first name, date of birth and NHS number
   Check donor unit number, blood group and expiry date

26.0 Guideline for Use of Fresh Frozen Plasma

Indications for Fresh Frozen Plasma (FFP) use

- Major haemorrhage (section 22.0)
- Emergency surgery INR > 2.0 (Patients on warfarin consider Vitamin K)
- Invasive procedures if INR > 1.5 (Patients on warfarin consider Vitamin K)
- Elective surgery INR > 2.0 A delay in surgery should be considered rather than Vitamin K or FFP
- Acute DIC
- Liver Disease with bleeding or potential for bleeding e.g. biopsy / surgery
- Thrombotic Thrombocytopenic Purpura

FFP not indicated

- Hypovolaemia
- Nutritional support and protein-losing states
- Treatment of immunodeficiency states

Dose

Initial dose 15 ml per Kg of body weight (4 units of FFP for 63 Kg / 10 stone person)
Subsequent doses must be dependent on laboratory results and patients clinical response.

Laboratory Tests

Prior to first administration of FFP blood samples should be taken for: -

- Group & Save
- FBC
- INR, APTR and Fibrinogen

For subsequent doses blood samples should be taken for:-

- INR, APTR and Fibrinogen

ABO and Rh D compatibility

ABO compatible FFP should be used, but compatibility testing is not required. AB is the universal donor group for FFP but should be given only in emergencies when the blood group is unknown. It does not need to be Rh D compatible.

Special requirements

FFP does NOT need to be CMV-negative or irradiated.
FFP given to neonates and children under 16 years of age should be obtained from an area free of BSE (non UK plasma) and subjected to pathogen-reduction procedures i.e FFPMB or FFPSD

How to request FFP

All requests must go through the Transfusion Laboratory. The request should be verbal (section 13.0). The following information must be given:-

- Full patient details
- Full requester details
- Reason for the transfusion

All requests, except those for major haemorrhage, need to be discussed with the Consultant Haematologist on-call.

Collection
Fresh frozen plasma is collected directly from the Transfusion Laboratory by portering staff. All must be delivered immediately to the clinical area.

Administration

A copy of the administration information stated below will be sent to the clinical area with the Fresh Frozen Plasma.

1. FFP must be administered immediately after thawing to avoid loss of activity of coagulation factors.

2. Patient must be wearing an identification band (or equivalent) during administration with full name, date of birth and NHS number clearly stated on it.

3. Administer each unit over 30 minutes. Can be administered quicker if indicated by patients clinical situation

4. Administer through a sterile blood administration set with integral mesh filter (170 – 200 micron).

5. Do not mix with any other blood component or fluid.

6. Once thawed FFP must not be placed in a blood fridge or clinical fridge

7. Record Temperature, Pulse and Blood Pressure before and at end of each unit

8. Perform final administration check at the patient's side :-
   Check last name, first name, date of birth and NHS number
   Check donor unit number, blood group and expiry date

9. If there is a decision not to transfuse the FFP once it has arrived in the clinical area. Contact Transfusion Laboratory immediately stating reason why it is not being administered and send thawed FFP back.

Thawed FFP not administered
If thawed FFP is returned to Transfusion Laboratory. The time it has been thawed will be established based on the time stated on the front of each unit. The appropriate action will be taken.
If thawed for less than 30 minutes it can be kept in the Transfusion Laboratory fridge and transfused within 24 hours.

27.0 Guideline for Use of Cryoprecipitate

Indications for use
- Major haemorrhage when fibrinogen falls below 100mg/dl (1.0g/L) (Section 22.0).
- Acute disseminated intravascular coagulation (DIC) when fibrinogen falls below 100mg/dl (1.0g/L)

Cryoprecipitate not indicated
- Chronic disseminated intravascular coagulation (DIC)
- Thrombotic Thrombocytopenic Purpura (TTP)

Dose
Initial dose is 2 large packs of cryoprecipitate for an adult. Each pack contains 5 donor pools.
Subsequent doses must be dependent on laboratory results and patients clinical response.

Laboratory Tests
Prior to first administration of cryoprecipitate blood samples should be taken for: -
- Group & Save
- FBC
- INR, APTR and Fibrinogen

For subsequent doses blood samples should be taken for:-
- INR, APTR and Fibrinogen

ABO and Rh D compatibility
ABO compatible cryoprecipitate should be used, but compatibility testing is not required. AB is the universal donor group for cryoprecipitate but should be given only in emergencies when the blood group is unknown. It does not need to be Rh D compatible

Special requirements
Cryoprecipitate does NOT need to be CMV negative or irradiated

How to request cryoprecipitate
All requests must go through Transfusion Laboratory. The request should be verbal (section 13.0). The following information must be given:-
- Full patient details
- Full requester details
- Reason for the transfusion

All request, except those for major haemorrhage, need to be discussed with the Consultant Haematologist on-call.

Administration

A copy of the administration information stated below will be sent to the clinical area with the cryoprecipitate.

1. Cryoprecipitate must be administered immediately after thawing to avoid loss of activity of coagulation factors.

2. Patient must be wearing an identification band (or equivalent) during administration with full name, date of birth and NHS number clearly stated on it.

3. Administer each large pack over 30 minutes.

4. Administer through a sterile blood administration set with integral mesh filter (170 – 200 micron).

5. Do not mix with any other blood component or fluid

6. Once thawed cryoprecipitate must not be placed in a blood fridge or clinical fridge

7. Record Temperature, Pulse and Blood Pressure before and at end of transfusion

8. Perform final administration check at the patient's side :-
   Check last name, first name, date of birth and NHS number
   Check donor unit number, blood group and expiry date

9. If there is a decision not to transfuse the cryoprecipitate once it has arrived in the clinical area. Contact Transfusion Laboratory immediately stating reason why it is not being administered and send thawed cryoprecipitate back.

Thawed cryoprecipitate not administered
If thawed cryoprecipitate is returned to Transfusion Laboratory. The time it has been thawed will be established based on the time stated on the front of each unit. The appropriate action will be taken.
Once thawed, keep at room temperature and transfuse within 4 hours.

28.0 Guideline for Use of Immunoglobulin Anti D

The development of anti-D antibodies generally results from foetomaternal haemorrhage (FMH) occurring in Rh D negative women who carry a Rh D positive foetus. It is recommended that immunoprophylaxis be given routinely antenatally, following potential sensitising events during pregnancy and post delivery of a Rh D positive infant.

Routine Antenatal Prophylaxis
Anti-D immunoglobin is offered to all Rh D negative women at 30 weeks gestation in accordance with National Institute for Clinical Excellence (NICE) guidelines.
The use of antenatal prophylaxis anti-D at 30 weeks, 1500 units, should not be affected by whether the woman has had a dose of anti-D immunoglobin for a potentially sensitising event.

Potential sensitising events

- Intervention to evacuate uterus before 12 weeks
- Spontaneous miscarriage after 12 weeks
- PV bleeding after 12 weeks
- Termination of pregnancy
- Invasive prenatal procedures
- Ectopic pregnancy
- ERPC
- Intrauterine death
- Ante partum haemorrhage (APH)
- Closed abdominal injury
- Delivery of a Rh D positive infant

Issue of Immunoglobin Anti-D
Immunoglobin anti-D will be issued from the Transfusion Laboratory on a named patient basis following a Group and Save sample that confirms that the woman is Rh D negative.
The dose of immunoglobin anti-D issued depends on gestation:-

250 i.u. immunoglobin anti-D should be given to woman less than 20 weeks gestation.
500 i.u. immunoglobin anti-D should be given to woman greater than 20 weeks gestation.

The immunoglobin anti-D will be issued with 2 slips of paper. After administration to the woman, the slips should be completed with date, time and signature of the person administering the immunoglobin anti-D. One slip should be filed in the medical notes and the other returned to Transfusion Laboratory.

Administration of anti-D
Intramuscular anti-D is best given into the deltoid muscle as injections into the gluteal region often only reach the subcutaneous tissues and absorption may be delayed.

For successful immunoprophylaxis, anti-D should be given as soon as possible after the sensitising event but always within 72 hours. If it is not given before 72 hours, every effort should still be made to administer the anti-D, as a dose given within 9-10 days may provide some protection (*Grade B recommendation*). Women who are already sensitised should not be given prophylactic anti-D.

Stock Immunoglobin Anti-D

This is limited to women who are admitted as an emergency between midnight and 08:00 hours, are being discharged from hospital before the next working day and have documented evidence that their blood group is Rh D negative.
Stock Immunoglobin anti-D is available on Delivery Suite and Hurley ward only.
Woman under 20 weeks gestation should have 250 i.u.
Woman over 20 weeks gestation should have 500 i.u.
Each vial of stock immunoglobin anti-D has 2 slips of paper. After administration to the woman, the slips should be completed with full woman's details, date, time and signature of the person administering the immunoglobin anti-D. One slip should be filed in the medical notes and the other returned to Transfusion Laboratory.

29.0 Use of Granulocytes / Buffy coat

Granulocytes are very seldom prescribed and are only ordered and issued following discussion with consultant haematologist. All granulocytes are irradiated.

Granulocytes are collected directly from the Transfusion Laboratory by portering staff. All must be delivered immediately to the clinical area.

Administration

A copy of the administration information stated below will be sent to the clinical area with the granulocytes.

1. Granulocytes must be administered immediately upon arrival in clinical area. They should be kept at room temperature not placed in a fridge. They should not be agitated.

2. If there is a decision not to transfuse the Granulocytes – contact Transfusion Laboratory immediately.

3. There will be 10 small bags of granulocytes. Administer all of the units over 1 hour through a standard blood administration set. Do not mix with any other blood component or fluid

4. They must be ABO and Rh D compatible with the patient.

5. All units must be irradiated.

6. Record Temperature, BP, Pulse and oxygen saturations every 15 minutes during the infusion and then every 30 minutes for an hour post infusion.

7. In the event of a drop in saturations (less than 90%), dyspnoea, cyanosis or pulmonary oedema, the infusion should be stopped and urgent medical assistance sought.

8. Perform Administration Checks as for Red Cells by bedside:-
   Check Full name, DOB and NHS number
   Check Donor Unit Number, Blood Group and Expiry Date. They expire at midnight on day of expiry.

30.0 References

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2. British Committee for Standards in Haematology, Blood Transfusion Task Force. 2009. Guidelines on the administration of blood components. www.bcshguidelines.com

3. Blood Safety and Quality Regulations Act 2005

4. British Committee for standards in haematology, blood transfusion Task force. Guidelines for the use of Fresh Frozen Plasma, cryoprecipitate and cryosupernatant. British Journal of Haematology, 2004, 126, 11-28

5. Guidelines for the Management of Massive Blood Loss, British Journal of Haematology, 2006, Vol. 135, issue 5, p634-641

6. British Committee for Standards in Haematology, Blood Transfusion Task Force. Guidelines for the use of platelet transfusions. British Journal of Haematology, 2003, 122, 10-23

7. Clinical Green Top Guidelines for Use of Anti-D Immunoglobulin for Rh Prophylaxis (22) - Revised May 2002

8. NICE's guidance on the use of routine antenatal prophylaxis 2002 (http://www.nice.org.uk/cat.asp?c=31679)

9. National Patient Safety Agency Safer Practice Notice 14, November 2006

10. McClelland, DBL (ed) 2007 Handbook of Transfusion Medicine (4th Edition) The Stationery Office, London

11. Watson D et al 2008 Blood administration – 1 or 2 person checks, which is the safest method? Transfusion, 48 (4), 783-789

12. Hanan, M.Y., Padmore, R.E., Neurath, D.D., Rock, G.A. (2006) The effect of patient-controlled analgesia on co administered red blood cells. Transfusion, 46, 372-376

Appendix A: Transfusion Practice Audit Proforma

1. This patient is on

Is patient in a side room? Yes No

Section 1: Identity of Patient

2. Is a form of patient identity band being worn? Yes No

3. Are the patient details on this identification (*tick one option)*

a) hand written? b) printed using an electronic system?

Does this identification contain the patient's

4. Last name? Yes No

5. First name? Yes No

6. Date of birth? Yes No

7. NHS Number? Yes No

8. If no identification band is in place, identify, if possible, reason why, and give details:

9. Is the patient able to state full name and DOB to you? Yes No

10. Is the identity correct?

Data item Matches correctly with: H/W or A/L

	Patient statement	Identification band	Transfusion Care pathway	Unit of blood
Last name				
First name				
Date of birth				
NHS				

Section 2 – Prescription

11. Does the prescription have special requirements completed? Yes No

12. If the Yes box is ticked, does the unit meet those requirements? Yes No

Prescription rate? ☐

Section 3 – Monitoring and documentation

13. What is the date on was this unit is being transfused? ☐

14. Is that date documented? Yes No

15. Is the start time documented? Yes No

16. If yes, what is the unit start time? ☐

17. Is there a signature on the red sticker of the person administering the blood? Yes No

18. Was a pre-transfusion BP, pulse and temp recorded within 60 minutes before the start time? Yes No

19. When was the first set of observations recorded? ☐

20. Is that stop time documented? Yes No

21. What is the unit stop time? ☐

22. Was a post-transfusion BP, pulse and temp recorded no more than 60 minutes after the transfusion end time? Yes No

23. Unit number out of Total units? ☐

24. Unit number ☐

25. Time from collection to starting unit ☐

Appendix B: Taking a Blood Sample / Venepuncture Assessment Form

Name of Member of Staff:	Name of Assessor:
Job Title:	Job Title:
Location:	Date of Assessment:

Observational Assessment

Core competency	**Competent**	**Not competent**
1. Completing the minimum information on the request form a. Full name b. Date of Birth c. NHS number d. Signature of person and contact details e. Clinical details f. Consultant		
2. Bleed only one patient at a time		
3a. Patient identification In the **conscious patient** ask the patient to state their a. Full name b. DOB c. Check the details on the ID band d. Cross checks all patient information on the ID band with the request form		
3b. Patient identification (unconscious) In the Unconscious patient/Unable to verbally comply a. Check the details on the ID band are correct and the minimum information of: Full Name, DOB, NHS Number Cross checks the information on the ID band with the transfusion request form		
4. Personal checks • Wash your hands • Use personal protective equipment		
5. Taking the venous blood sample a) Prepares skin properly b) Use tourniquet appropriately c) Minimises discomfort to the patient d) Takes sample tubes in the correct order. e) Monitors the patient's responses f) Removes needle using the appropriate technique g) Applies a dressing at the end of the procedure		
6. Labelling the blood sample Appropriately labels the blood sample immediately and at the patient's bedside with: a. Full name,		

b. DOB c. NHS d. Gender e. Date & time f. Their signature and contact details		
7. Packaging and documentation a) Places the blood sample in the correct collection point		

Knowledge Assessment

Did the candidate know and understand the importance of:

	Competent	**Not competent**
Using open-ended questions for patient identification		
Not pre-labelling bottles		
Correct procedure if unconscious patient or unable to give verbal identification		
The risks of bleeding more than one patient at a time		

All of the above criteria must be achieved to gain competency

Assessor:

Signed: ..... Date: ___/ ___/ 2010

Print Name:

Staff Member:

Statement of Competence:
I have been given the opportunity to read the above assessment and I agree with the findings. I believe that I am competent to take blood samples in accordance with the Trusts Policies, and agree to ensure my knowledge and skills are kept up to date.

Signed: ..... Date: ___/ ___/ 2010

Print Name: .....

Appendix C: Collecting a Blood Unit Assessment Form

Name of Member of Staff:	Name of Assessor:
Job Title:	Job Title:
Location:	Date of Assessment:
Staff ID Number:	Barcode Number:

Observational Assessment

Core competency	**Competent**	**Not Competent**
1. Bring written patient details to the fridge to collect blood unit with a. Full name b. Date of Birth c. NHS number		
2. Correctly access the refrigerator using individual ID number		
3. Takes the unit of blood in the correct order		
4. Correctly "scan" the unit for removal from fridge		
5. Correctly checks the patient details when removing a unit a. Carepathway or Collection slip against red label on unit of blood b. Red label on unit of blood and Blood Track screen		
6. Correctly returns a unit to the fridge		
7. Correctly close the programme on completion		
8. Aware of the importance of delivering unit immediately to clinical area		

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Knowledge Assessment
Did the candidate know and understand the importance of:

	Competent	**Not competent**
The importance of bringing written documentation to the blood fridge		
The importance of maintaining a secure individual ID number		
The appropriate action to take in the event of an “alert” message		
The appropriate action to take if the patient details do not match		
Who to contact on finding system down		
The correct procedure for transfer of blood to a another blood fridge		
The correct procedure for collection of Emergency O negative blood		
The importance of removing only one unit at a time (unless an emergency)		
The action to take if blood is not found in the refrigerator		

All of the above criteria must be achieved to gain competency

Assessor:

Signed: ..... Date: ___/ ___/ 2010

Print Name:

Staff Member:

Statement of Competence:
I have been given the opportunity to read the above assessment and I agree with the findings. I believe that I am competent to take blood samples in accordance with the Trusts Policies, and agree to ensure my knowledge and skills are kept up to date.

Signed: ..... Date: ___/ ___/ 2010

Print Name: .....

Appendix D: Preparing and Administering a Blood Transfusion Assessment Form

Name of Member of Staff:	Name of Assessor:
Job Title:	Job Title:
Location:	Date of Assessment:

Observational assessment

Core competency	**Competent**	**Not Competent**
1. Carries out the four types of pre-transfusion checks correctly a. **Personal**: cleans hands, wears personal protective equipment and adhere to infection control guidelines at all times. b. **Equipment**: check that all equipment is clean and available (i.e. transfusion care pathway, giving set, pump) c. **Patient**: carry out a baseline assessment of the patient; check venous access has been obtained prior to blood being collected from the fridge, read through the prescription; and check that the patient understands they are going to receive a transfusion. d. **Blood component**: check the quality of blood component, expiry dates and any special requirements.		
2. Patient identification for the conscious patient: Did the member of staff ask the patient to state their a. Full name? b. Date of Birth? Did the member of staff check: c. The details on the identification band or other attached identifier were correct?		
3. Patient identification for unconscious patients or patients unable to verbally respond: Did the member of staff check details on the identification band or other attached identifier and their*:* • Full Name? • Date of Birth? • NHS?		
4. Did the member of staff record the patient's vital signs before the transfusion a. Blood pressure? b. Temperature? c. Pulse rate?		
5. Administering the blood transfusion Did the member of staff ensure that the blood transfusion was: a. Completed within four hours of it leaving the fridge OR b. Within 30 minutes for platelets Did the member of staff: c. Monitor the patient's vital signs 15 minutes after starting the unit d. Dispose of equipment safely e. Monitor the patient's vital signs after the unit has been administered		

6. Documentation Did the member of staff record the following information on the transfusion care pathway / transfusion record a. Date b. Start time c. Signature of staff performing administration check d. Stop time of the transfusion Did the member of staff: e. Complete the traceability document in accordance with national law		

Knowledge assessment

Did the candidate know and understand the importance of:

Using open-ended questions for patient identification?		
The timescales for administering blood safely after it had been collected from the fridge?		
Correct procedure if unconscious patient or unable to give verbal identification?		
The risks associated with not checking the verbal statement or identification band of the patient with the details on blood unit?		
Know the action to be taken if a discrepancy in patient details or blood unit details is detected during the administration check?		
When it was appropriate to monitor the patient's vital signs throughout the transfusion process?		

All of the above criteria must be achieved to gain competency

Assessor:

Signed: ..... Date: ___/ ___/ 2010

Print Name:

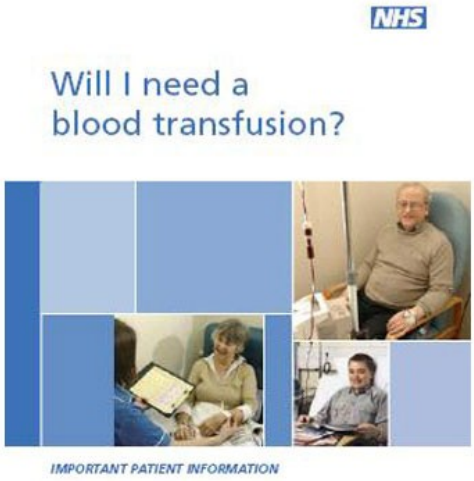
Staff Member:

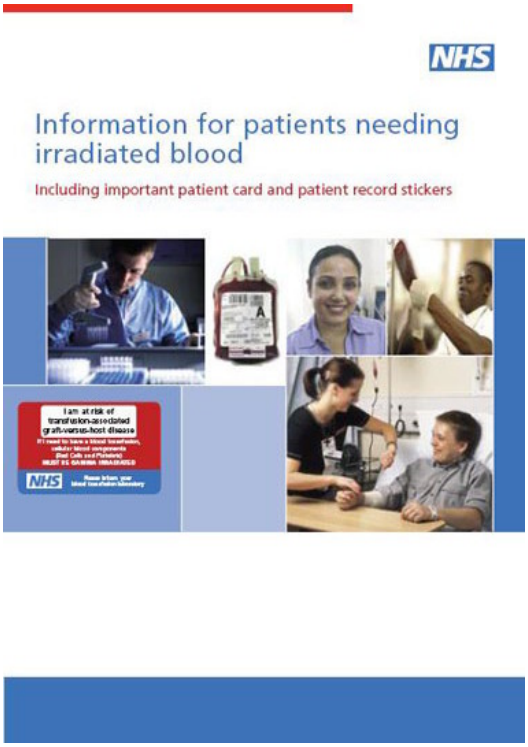
Statement of Competence:
I have been given the opportunity to read the above assessment and I agree with the findings. I believe that I am competent to administer blood transfusions in accordance with the Trusts Blood Transfusion Policy 2008, and agree to ensure my knowledge and skills are kept up to date.

Signed: ..... Date: ___/ ___/ 2010

Print Name: .....

Appendix E: Patient Information Leaflets





Author:	Tanya Hawkins	Date:	Sept 2010
Job Title:	Transfusion Practitioner	Review Date:	Sept 2012
Policy Lead:	Simon Middleton. Chair, Hospital Transfusion Committee	Version:	Version 3.0
Location:			

Appendix F: Treatment of Jehovah's Witnesses with Blood Components or Products

The aim of this policy is to ensure that Jehovah's Witnesses beliefs are acknowledged and respected and to provide information about the management of these patients.

When a Jehovah's Witness presents for treatment, staff concerned should discuss with them their beliefs and their relevance to the proposed treatment.

1. In elective and urgent cases when blood transfusion might be possible or likely, the following actions should be considered:
   a) Review non-blood medical alternatives and treat without using allogeneic blood.
   b) Consult with other doctors experienced in no-blood management and treat without using allogeneic blood.
   c) If necessary, transfer patient to a co-operative doctor or facility before the patient's condition deteriorates.

2. Consult local Hospital Liaison Committee for Jehovah's Witnesses, regarding alternative care and/or locating co-operative doctors at other facilities.

   Member of the local (Oxford) Liaison Committee can be contacted on: -

Name	Hospitals covered	Contact (Home)
Edward Ziebart	Royal Berkshire NHS Foundation Trust	01189 431048 (Home) 07926084351 (Mobile) ed@ziebart.freeserve.co.uk
Ray Bannister (Chair)	John Radcliffe Radcliffe Infirmary Churchill Manor	01867 821423 (Home) 07734 735645 (mobile) ray@ban.go-plus.net

3. In a life-threatening emergency, the above actions should be followed whenever possible. If for any reason, this is not possible, the patient's view, if known to the medical or nursing staff involved, should be honoured. It is normal for Jehovah's Witnesses to carry an Advance Medical Directive document stating their views. The advice of the Claims and Legal Services Manager (or deputy) should be sought if necessary. Out of hours contact the Trust Senior Manager on call (via switchboard).

4. Children
   Any child, who is judged to be of sufficient age and maturity to fully understand the implications involving the use of blood, should be treated as above. If elective or urgent treatment of any other child is felt to be essential by medical staff, against the wishes of parents or guardians, the following questions should be addressed: -
      a) Have the risks of using blood been fully considered?
      b) Have all non-blood medical management options been fully explored?
      c) Has the JW Hospital Liaison Committee been asked for assistance?
      d) Is there another Hospital willing to treat without blood?

   If treatment is still felt to be essential, an application to the High Court in accordance with Section 8 of The Children Act 1989 should be sought with the support of a minimum of two practitioners of Consultant status. The parents or guardians should be notified immediately of this and invited to any case conference. The Application should be limited to the immediate medical incident.

If, in exceptional and imminently life threatening circumstances, it is felt that a delay in treatment with blood or blood products might be fatal, a decision to proceed with treatment against the wishes of parents or guardians should be made by two practitioners of Consultant status who are fully informed of the situation and appropriately aware of alternative forms of treatment. These Consultants must accept accountability for this decision.

5. Jehovah's Witnesses' Position on Medical Treatment
   The decision of an individual Jehovah's Witness absolutely to refuse blood and blood components is a matter of personal choice. They will accept full legal responsibility for their decision and will release those treating them from liability for any adverse consequences directly arising from the curtailment of management options by the exclusion of blood or blood components.

6. Auto Transfusion / Haemodilution
   Immediate intra-operative and post operative auto transfusion (cell salvage) is permitted by many Witnesses provided the circuit is linked to the patient's circulatory system at all times and there is no storage of the blood. However, pre-operative autologous donation (PAD) and subsequent reinfusion is not permitted.
   Intraoperative haemodilution is permitted by many Witnesses when the equipment is arranged so as to keep the blood in a constant link to the patient's circulatory system.

7. Blood Transfusion
   Transfusions of whole blood or blood components (red cells, white cells, platelets, fresh frozen plasma and cryoprecipitate) are rejected. For blood fractions see below.

8. Fractionated Blood Products
   Each Witness will decide individually whether to accept such fractions as albumin, immunoglobulins (e.g Anti D) and clotting factors (e.g. factor VIII for haemophilia A).

9. Blood Volume Expanders
   Non-blood volume expanders are acceptable. Examples are: - Saline, Dextran, Gelofusin, Ringer's Solution and Haemaccel.

Appendix G: Indications for Red Cell Transfusion

1. When to Transfuse – Transfusion Trigger

No blood transfusion is without risks, but equally the administration of blood may be life saving. In making the decision to transfuse the balance of risks must be considered for each individual patient Factors influencing the decision to transfuse include:

- The haemoglobin level/haematocrit
- A clinical judgement about the patient's ability to tolerate anaemia including the presence of other factors such as cardiac and respiratory disease and sepsis.
- Patient's age / prognosis - you may choose to avoid blood in a young woman who has not yet had children because of the risk of haemolytic disease of the newborn, whereas in someone with a short life expectancy the risks from the delayed adverse effects of transfusion are less and the risk of withholding transfusion may be higher.

Threshold for transfusion

There are no absolute thresholds for transfusion but the following may be a guide.

a) For patients who are otherwise **well with stable anaemia** the following transfusion triggers might be considered:

< 4.0g	Transfuse unless fit and haemoglobin rising
4.0-7.0	Transfusion usually necessary
7.0-10.0	Transfusion not usually necessary
>10.0g	Transfusion rarely required

Patients who are symptomatic or have co-existent cardiovascular or respiratory disease may require higher thresholds.

b) For otherwise **fit patients with a previously normal haemoglobin who are actively bleeding** the following guidelines might be applied:

Blood loss < 15% blood volume	Give fluids, no need to transfuse
Blood loss 15% - 30% blood volume	Transfusion not usually necessary
Blood loss 30% - 40% blood volume	Transfusion usually necessary
Blood loss >40% blood volume	Transfusion indicated

(To estimate blood volume = about 70mL/kg in adults; 20% is approximately 1 litre)

c) For patients with a **short life-expectancy** or those with **chronic anaemia** and **impaired red cell production**, the main trigger for transfusion should be the patient's symptoms.

2. How much to transfuse – Transfusion Target

In addition to considering when to transfuse it is also important to consider how many units to give. In deciding this a target haemoglobin needs to be established. In general as shown above, there are few indications to transfuse above 100g/L if bone marrow function is normal.

Guide to number of units required to achieve the 'target' haemoglobin

Amount of haemoglobin in a unit of red cells = approx 60g			
Blood Volume (70mL/kg in adults)	50kg (3.5L)	60kg (4.2L)	70kg (4.9L)
Increase in haemoglobin after one unit transfusion	1.7g	1.4g	1.2g

Appendix H: **Maximum Blood Ordering Schedule (MSBOS)**

Certain surgical procedures should have red cell units crossmatched pre operatively. The table below indicates the agreed number of red cell units that will normally be crossmatched pre-operatively to cover a specified surgical procedure.
Surgical procedures not stated below should have a Group & Screen only sent to the Transfusion Laboratory pre operatively.

Please state the surgical procedure and date of surgery under clinical details on the request card. “Pre-op” or “For theatre” will be processed as a Group & Screen only. No red cell units will be crossmatched pre-operatively.

If additional units are required pre-operatively, or a surgical procedure is not listed, the Transfusion Laboratory should be contacted on ext. 7697 or bleep 298.

General & Vascular Surgery

Aneurysm	2	Gastrectomy: Total	2
Oesophagectomy	2	Panproctocolectomy	2
Splenectomy	2		

Urology

Cystectomy	2	Cystourethrectomy	4
Nephrectomy	2	Ureteric surgery	2
Prostatectomy Radical	2		

Orthopaedics

Fracture shaft of femur	2	Revision THR	2
Revision TKR	2	Spinal Fusion	2

Gynaecology

Hydatidiform Mole	2	Myomectomy	2

Obstetrics

Caesarean Section: With specific reason	2
Caesarean Section: Placenta Previa	4

Head & Neck

Please state surgical procedure and number of units required.

Appendix I: **Indications For Special Requirements: Red Cells and Platelets**

CMV-Negative	Irradiated
Give CMV-negative blood components until the patient's own CMV status is known for the following:- • Acute Leukaeamia – transplantable age (< 65 years) • Non Hodgkin's Lymphoma – transplantable age (< 65 years) • Multiple Myeloma – transplantable age (< 65 years) • Chronic Myeloid Leukaemia – transplantable age (< 65 years) • Hodgkin's disease – transplantable age (< 65 years) • Severe Aplastic Anaemia – transplantable age (< 65 years) **Known CMV-Negative patients:-** Any patient who is going to have or has had:- • Autograft • Peripheral Blood Stem Cell transplant • Allograft • Unrelated Donor transplant • Bone Marrow transplant • Renal transplant **Also** • Patients with HIV infection • Pregnant woman • Less than 12 months old	**Indefinitely** • Patients with Hodgkin's disease • Patients treated with purine analogue drugs such as fludarabine, cladrabine, deoxycoformycin • Patients treated with anti-thymocyte globulin **(**ATG) or anti-lymphocyte globulin (ALG) • ESHAP if stem cell collection • Allograft patients: Bone Marrow (BM) or Peripheral Blood Stem Cell (PBSC) **Patients in the following group for the specified time:-** • 10 - 14 days before stem cell harvest / collection • Autologous transplant recipients (BM or PBSC) for 6 months • Receiving cyclosporin or other immunosuppression drug post allograft • 10 - 14 days before stem cell rescue **Also** • Intra Uterine Transfusion • Neonatal Top up if had an Intra Uterine Transfusion • Exchange transfusion • Congenital Immunological Deficiencies • 1st or 2nd degree relatives **Following components are supplied by the NBS as irradiated** • Granulocytes • HLA matched platelets

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Appendix J: **Page 2 of Blood Transfusion Care Pathway**

- **History of reaction to blood products** No □ Not known □ Yes □ If yes, specify: allergic reaction □ hyperpyrexia □ other . . . .
- **Special blood products required** No □ Yes □ If yes, specify CMV negative □ Irradiated □ Other . . . . .

Date given	**Component**	**Unit**	**Duration**	**Prescriber signature**	**ID band Checked Initial**	**Volume**	**At start of each unit**	**Attach completed label for each Unit**	**At 15 minutes** See note 12 page 4
							Time : hrs Temp Pulse BP	Label	Time : hrs Temp Pulse BP
							Time : hrs Temp Pulse BP	Label	Time : hrs Temp Pulse BP
							Time : hrs Temp ulse BP	Label	Time : hrs Temp Pulse BP

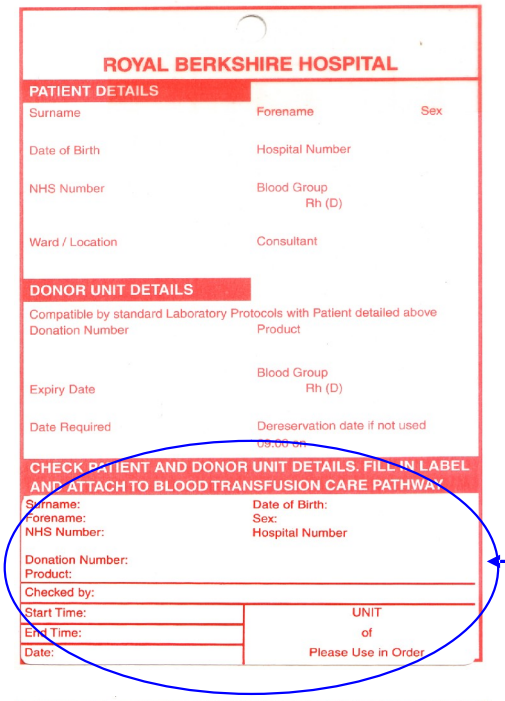
Appendix K: Red Cell Units Location by Clinical Area

Buscot Delivery Suite Hurley Iffley Marsh Maternity Day Assessment Unit Sonning	Maternity Fridge

Adelaide Albert Benyon Berkshire Cancer Centre CAPD Haemodiaylsis Unit Huntley & Palmer RACOP West Woodley	North Wing Fridge

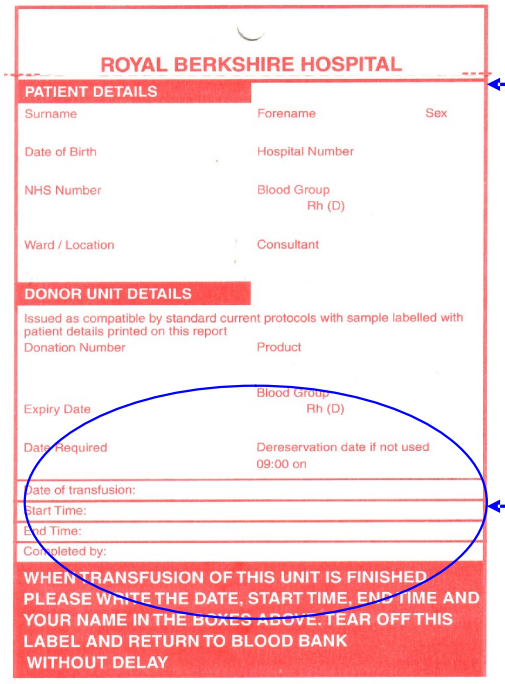
All Other Locations Are South Wing Fridge
Units will be placed in South Wing Theatre Fridge as necessary

Appendix L: Laboratory Generated "Red" Label



FRONT of Transfusion Red Label

Removable Adhesive Label.
Complete "Date", "Start time" & "Checked by" at **start** of unit. Remove sticker and attached to transfusion care pathway / documentation sheet. Complete "End time" when unit has finished



BACK of Transfusion Red Label

Detach Red Label Here

Detachable part of label
Complete "Date", "Time" and "Signature" immediately unit has **started**.
Return to Transfusion Laboratory via pathology specimen route: collection or air tube.
Do not return via internal mail

Appendix M: Blood Collection Slip

Royal Berkshire NHS
NHS Foundation Trust

Date: ……

Location:……

Collect ☐ Unit(s) of Red Cells

Patient Details

Last name	
First name	
Date of Birth	
Hosp / NHS No.	

Received in Clinical Area	
Date:	
Time	
Signature:	

Appendix N: Acute Transfusion Reactions

Apart from minor febrile non-haemolytic transfusion reactions report all reactions to consultant haematologist on call and Transfusion Laboratory

Signs & Symptoms	Cause	Timing of Occurrence	Management
Temperature rise greater than 1.5 ° C above baseline Shivering, flushing Hypotension Tachycardia Back / abdominal pain Confusion / agitation	Acute Haemolytic Reaction due to ABO incompatible transfusion	During first 15 minutes after start of unit. First 10 – 20 mls of unit	Stop Transfusion Change giving set and commence normal saline to maintain BP and renal perfusion. Treat for Shock Contact Consultant Haematologist Send Unit back to Blood bank Take blood samples for Crossmatch, FBC, U&E, clotting
Temperature rise 1 – 1.5 ° C above baseline No change in BP or Pulse	Non Haemolytic Febrile reaction due to reaction against leucocytes in the red cells or cytokines in stored platelet concentrates.	Towards end of infusion or within hours of completing the transfusion.	Slow Transfusion Repeat observations after 15 mins Give Paracetamol
Temperature slightly elevated Rash, hives Itching	Antibodies to infused plasma proteins or infusion of allergens	During infusion of 100 ml of unit. Occurs with transfusions of platelets or plasma more than red cells.	Slow Transfusion Give Chlopheniramine 10 mg iv Continue with transfusion and observe Prior to next transfusion give Chlorpheniramine 10 mg i.v and Hydrocortisone 100 mg i.v
Hypotension Bronchospasm Swelling of eyes Severe itchy / rash	Anaphylaxis due to IgA deficiency	During infusion of 100 ml of unit.	Stop Transfusion Maintain airway Give oxygen Give 1:1000 adrenaline 0.5-1mg i/m and Chlorpheniramine 10-20mg by slow i/v injection..
Feeling hot - pyrexia Chest and abdominal pain Hypotension	Infective shock due to bacterial contamination	During infusion of first 100 ml. Occurs with platelets more than red cells	Stop Transfusion Manage septicaemia Give fluids and intravenous antibiotics.

Appendix N: Delayed Transfusion Reactions

Signs & Symptoms	Cause	Timing of Occurrence	Management
Falling haemoglobin, jaundice	Usually due to non-complement fixing red cell antibodies formed after previous red cell transfusions/ pregnancies	Reactions occurring more than 24 hours and usually 5-10 days after transfusion.	Investigate cause of jaundice – look for urobilinogen in urine, raised conjugated bilirubin. Direct antiglobulin test – positive with spherocytes on blood film. Positive antibody screen on fresh sample

Appendix O: Transfusion Reaction Form

Name:……

DOB:……

Hospital Number:……

Date of reaction:---------- Time of reaction----------

Ward/Department:---------- Consultant:----------

Donor pack number:---------- Expiry date:----------

Indication for transfusion :----------

Time transfusion started----------

Patient identity and demographic details re-checked, correct blood component administered to correct patient:

Yes ☐ No ☐

Baseline observations taken prior to start of suspected unit:-

Temperature:---------- Pulse:---------- Blood pressure:----------

Observations taken 15 minutes after start of suspected unit:-

Temperature:---------- Pulse:---------- Blood pressure:----------

Medical Response:-

Dr called at: ……. Seen by Dr at: ……..

Drugs given: …….. Time drugs given: ……

Did the patient suffer any life threatening or long term affects from reaction?:-

If yes: Please describe below:

……..

Did patient go to ICU: …… Was hospital stay prolonged? .....

Signs & symptoms Present:-

Dyspnoea ☐	Hypotension ☐	Pyrexia ☐	Tachycardia ☐
Flushing ☐	Rigor ☐	Rash ☐	Urticaria ☐
Loin/back pain	Chest pain ☐	Haemoglobinuria ☐	

Laboratory Results:-

Unit and sample checked for clerical errors: Yes ☐ ☐

Pre-tx group:---------- Post-tx group:----------

Pre-tx Ab screen:---------- Post-tx Ab screen:----------

Pre-tx DAT:---------- Post-tx DAT:----------

Unit DAT:----------

Pre-transfusion re-crossmatch:----------

Post-transfusion re-crossmatch: ----------

Microbiology results:

HLA Antibodies:

REPORT & CONCLUSION:-

Is this Reportable to MHRA? Yes ☐ Date reported …… No ☐

Is this SHOT Reportable? Yes ☐ Date reported …… No ☐

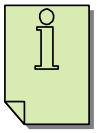
Person completing investigation:_____ Title:_____

Appendix P: Major Haemorrhage Process

Actions by Clinical Staff

Take Blood Samples
Transfusion, FBC, INR, APTR and Fibrinogen

Contact Blood Bank on ext 7697 or Bleep 298 (out of hours)
State you have a "Major Haemorrhage"

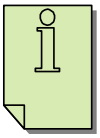


Give information
Patients details
Number of red cell (RBC) units required (4 to 8 units)
Name of caller
Designated contact person and number for duration of Major Haem.

Emerg O negs

Red cells needed immediately?
Inform blood bank prior to taking Emergency O negs and if further emergency O neg units might be required

Actions by Blood Bank



Will inform
If a second transfusion sample is required
How long the RBC will take: 15 or 60 minutes
That 4 units of FFP will be thawed and ready within 40 minutes
If transfusion sample has not reached lab within 10 mins

RBCs x 4 - 8

Issue 4 – 8 RBC units – within 15 or 60 minutes

FFP x 4

4 units FFP – within 40 minutes to thaw
Transfusion Documentation Sheet will be issued

Look up blood results, inform clinical area if components needed & issue

Cryo x 2

Cryoprecipitate: if fibrinogen <100 g/dL
2 large bags - Takes 30 minutes to thaw

Platelets x 1

Platelets: if count < 50 g/dL
1 pool of platelets

Actions by Clinical staff

Contact Blood Bank
If more RBCs are required or components not required

Repeat Blood Samples
30 minutes after components transfused for FBC, INR, APTR and Fibrinogen

Contact Consultant Haematologist on call
If patient continues to bleed following blood components or advised to by Blood Bank

STAND DOWN

Inform Blood Bank when Major Haemorrhage is Stood Down

Appendix Q

BLOOD TRANSFUSION DOCUMENTATION SHEET
FOR USE DURING MAJOR HAEMORRHAGE

Label	Label
Label	Label
Label	Label
Label	Label
Label	Label