This policy has been developed within the context of Equality and Human Rights statutory obligations and requirements.
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<th>Title</th>
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<td>30.0</td>
<td>References</td>
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</table>
1.0 Background to Policy

Correctly used, blood components can save lives and provide clinical benefit to many patients. However, a blood component transfusion is potentially hazardous and should only be given when the clinical benefits to the patient outweigh the potential risks.

SHOT\(^1\) (Serious Hazards of Transfusion) is a United Kingdom (UK) organisation that collates and analyses data on adverse transfusion events on an annual basis. SHOT\(^1\) demonstrates that the biggest risk to the patient is an incorrect blood component being transfused with human error being the main contributing factor.

Within the WHSCT, all staff involved in the blood transfusion process must have a valid training and competency assessment:

- **TRAINING** refers to the knowledge base required and the instruction of tasks related to blood transfusion (face to face session or completion of the elearning programme [www.learnbloodtransfusion.org.uk](http://www.learnbloodtransfusion.org.uk)). Training should be undertaken every 12 to 18 months\(^2\) (12 months if staff member involved in the collection of a blood component\(^3\)).
- **COMPETENCY** is the practical assessments to demonstrate safe practice of the relevant blood transfusion process and is renewed every 3 years\(^4\).

The Safer Practice Notice ‘Right Patient, Right Blood’ issued by the NPSA\(^4\) (National Patient Safety Agency) and endorsed in Northern Ireland by the Department of Health, Social Services and Public Safety (DHSSPS) was designed to improve the safety of blood transfusions and to promote strict checking procedures at each stage of the blood transfusion process. The main initiative in the Safer Practice Notice requires that staff involved in any of the processes of transfusion must successfully complete competency assessment **every 3 years**. The competencies are:

1. Obtaining a venous blood sample for pre-transfusion testing.
2. Organising a request for a blood component for transfusion.
3. Collecting a blood component for transfusion.
4. Preparing and administering a transfusion of a blood component.

This document outlines the policy on obtaining a sample for pretransfusion testing, prescribing blood components, requesting blood components, preparing and administering a transfusion, the initial management of adverse reactions and/or events and a summary on the use of blood products. This policy recommends the use of the Health and Care (H&C) Number as the unique identification number.
Exceptions to non use of the H&C Number (please ensure communication with Blood Bank when there is an exception):

- **Emergency situation in A&E** - patient requires an emergency transfusion - no H&C number available (eg non resident in Northern Ireland) or patient details are unknown - use AE number of current year – not an old AE number. This number must correspond exactly with the number on patient identification wristband. **NB** This AE number will be the unique identification number used on crossmatched blood for the patient. **NB If the patient is transferred to Theatres or to another clinical area and has a new patient identification wristband applied (when AH/ERN or H&C number allocated), a new group and screen sample must be sent to Blood Bank with the new unique patient identification number and the unit of blood will have to be recrossmatched.**

- **Non emergency situation in A&E** – no H&C number available (eg non resident in Northern Ireland) – the pretransfusion sample should not be sent until the patient has been allocated a AH/ERN number.

- **Newborn baby** - no H&C number assigned – use AH or ERN number until H&C number available.

- **Inpatient on clinical area** – no H&C number available (eg non resident in Northern Ireland) – use AH or ERN number.

Regional\(^5\) National and European guidelines in relation to the administration of blood components have been reviewed to prepare this policy in an effort to utilise best available evidence to ensure good clinical practice.

Key recommendations from the NI Regional Blood Transfusion Policy that have been implemented within this Policy include:-

- Positive patient identification.
- The policy is benchmarked against the WHSCT Patient Identification Wristband Policy\(^6\).
- A ‘no wristband, no transfusion’ policy.
- A detailed protocol which outlines every step of the blood transfusion process.
- All staff participating in the transfusion process must be appropriately trained and assessed and deemed competent to NPSA standards\(^4\).
- Where possible, the patient should be informed of the needs for the transfusion, and consent obtained and recorded in the patient’s clinical notes.
- All clinical details relating to the transfusion should be documented in the patient’s clinical notes, including the decision process for the transfusion, details of the blood components transfused and the date/time each unit was administered, patient monitoring observations, the outcome of the transfusion and the management of any adverse events.

**2.0 Objectives of the Policy**

This policy aims to provide guidance to all staff involved in the blood transfusion process for the safe and appropriate use of blood components within the Western Health and Social Care Trust.
3.0 Definition of Blood Component

The term ‘Blood Component’ is used throughout this policy. ‘Blood Component’ refers to:

- Red Blood Cells (hereafter referred to as Red Cells).
- Platelets.
- Fresh Frozen Plasma (hereafter referred to as FFP).
- Cryoprecipitate.

4.0 Suitable locations for storage of Blood Components

- Red cells must only be stored in temperature controlled blood refrigerators certified for use - not in clinical or other domestic refrigerators.
- Red cells may be transported in boxes that are designated for this purpose and have being validated locally.
- Platelet function is best maintained by storage at 22°C (room temperature) with agitation\(^7\). Platelets are NEVER stored in a blood fridge.
### 4.1 Summary of storage of Blood Components

<table>
<thead>
<tr>
<th>BLOOD COMPONENTS</th>
<th>STORAGE</th>
<th>LIFESPAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Cells</td>
<td>Temperature Controlled Fridge (+2 to +6°C)</td>
<td>35 days</td>
</tr>
<tr>
<td></td>
<td>Expires 12 midnight on date shown</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agitator in Blood Bank</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td>Room temperature (22 ±/2°C)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expires 12 midnight on date shown</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freezer – then thawed (takes 30 minutes)</td>
<td>Transfuse as soon as possible</td>
</tr>
<tr>
<td></td>
<td>Once defrosted can be stored in temperature controlled fridge (+2 to +6°C) in Blood Bank for 24 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cryoprecipitate</td>
<td>Transfuse as soon as possible</td>
</tr>
<tr>
<td></td>
<td>Freezer – then thawed (takes 30 minutes)</td>
<td>Once thawed, never put in fridge &amp; must be used within 4 hours</td>
</tr>
<tr>
<td></td>
<td>Once defrosted, stored at room temperature (22 ±/2°C)</td>
<td></td>
</tr>
</tbody>
</table>
5.0 Definition of Responsibilities
Many groups of staff are involved in one or more aspects of blood transfusion. Some procedures are exclusively the responsibility of one staff group, others can be carried out by more than one staff group. It is important that the responsibilities of each staff group are defined and that each member of staff in that group are aware of their responsibilities and the responsibilities of others within the process.

5.1 WHSCT Management is responsible for:
- Ensuring that there is senior management commitment to the HSS Circular HSS(MD) 17/2011\(^2\).
- Ensuring appropriate membership and function of the Hospital Transfusion Committee.
- Ensuring appropriate composition and function of the Hospital Transfusion Team.
- Ensuring appropriate blood transfusion policies are implemented and reviewed.
- Ensuring compliance with the Blood Safety and Quality Regulations\(^3\).

5.2 WHSCT Hospital Transfusion Committee (HTC) is responsible for:
- Promoting best practice through local protocols based on national guidelines.
- Leading multi-professional audit on the use of blood components within the Trust.
- Auditing the practice of blood transfusion against relevant Regional and National guidelines.
- Providing feedback on audit of transfusion practice and the use of blood components to all hospital staff involved in blood transfusion.
- Promoting the education and training of all clinical, laboratory and support staff involved in clinical aspects of the blood transfusion process.
- Facilitating competency based training and assessment to comply with the requirements of the NPSA\(^4\).
- Being a focus for local contingency planning for and management of blood shortages\(^8\).
- Reporting regularly to the Northern Ireland Transfusion Committee (NITC).
- Participating in the activities of the NITC.
- Consulting with local patient representatives groups where appropriate.
- Contributing to the Trust Clinical Governance agenda.

5.3 WHSCT Hospital Transfusion Team (HTT) is responsible for:
- Assisting in the implementation of the HTC's objectives.
- Promoting and providing advice and support to clinical teams on the appropriate and safe use of blood components.
- Actively promoting the implementation of good transfusion practice.
- Being a resource for training of all clinical, laboratory and support staff involved in clinical aspects of the blood transfusion process.
- Clearly defined annual work plans reflecting the objectives of the HTC.
5.4 **Haemovigilance Practitioners are responsible for:**
- Ensuring quality improvements in transfusion.
- Reviewing, implementing and disseminating policies and procedures pertaining to transfusion.
- Minimising risk associated with transfusion.
- Education and development – inducting and updating of all clinical and support staff involved in clinical aspects of the blood transfusion process.
- Facilitating competency based training and assessment to comply with the requirements of the NPSA\(^4\).
- Investigation and reporting of transfusion reactions and other untoward incidents related to blood transfusion.
- Facilitating clinical audit and review of all clinical aspects of the blood transfusion process.
- Acting as a clinical specialist to advise individuals, clinical teams, patients and outside agencies.
- Developing, compiling and disseminating regular management reports relating to audit reports and component use.

5.5 **Clinical staff are responsible for the following providing they have the relevant training and competency assessment (see 1.0):**

<table>
<thead>
<tr>
<th>Staff Group</th>
<th>Competency 1</th>
<th>Competency 2</th>
<th>Competency 3</th>
<th>Competency 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obtaining a venous blood sample for pre-transfusion testing</td>
<td>Organising a request for a blood component for transfusion</td>
<td>Collecting a blood component for transfusion</td>
<td>Preparing and administering a transfusion of a blood component</td>
</tr>
<tr>
<td>Doctor</td>
<td>√</td>
<td>√</td>
<td>X</td>
<td>√</td>
</tr>
<tr>
<td>Nurse/Midwife</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>(South West Acute Hospital (SWAH), Tyrone County &amp; Theatres, Altnagelvin)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Care Assistant</td>
<td>√</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>(SWAH &amp; Tyrone County)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Porter</td>
<td>X</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Operating Department Assistant</td>
<td>X</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Theatre Orderlies</td>
<td>X</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>(Satellite Blood Fridge)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Department Practitioner</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Phlebotomist</td>
<td>√</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Support Services Assistant</td>
<td>X</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>(Renal Unit, Altnagelvin)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.6 **Medical staff are also responsible for the following:**
- Assessing the patient’s blood component requirement.
- Prescribing blood components stating component, quantity, duration of transfusion and any special requirements (e.g. irradiated).
- Ensuring adequate documentation of blood transfusion in the medical case notes.
- Informing the patient of the indication for the blood transfusion, its risks and benefits, his/her right to refuse the transfusion and alternatives to a transfusion if available.
- Informing the General Practitioner about the transfusion of multiple blood components and / or blood products to the patient during hospital admission via the medical discharge letter.
- Informing the patient of the increased risk of contracting vCJD through transfusion.

5.7 **Nursing Staff are also responsible for:**
- Monitoring the patient during the transfusion and carry out appropriate actions in the event of adverse reaction or event.
- Reporting transfusion reactions or other incidents related to transfusion to the Blood Bank.

5.8 **Biomedical Scientists in Blood Bank are responsible for:**
- Ensuring labelling of request forms and blood samples comply with regionally agreed guidelines for accepting and rejecting samples for testing.
- Performance of blood grouping, antibody screening and pretransfusion compatibility testing.
- Checking laboratory records for historical blood group information and any special requirements flagged in patient’s laboratory record.
- Ensuring blood components are issued according to recommended guidelines.
- Ensuring blood components are properly labelled.
- Ensuring the identification details of the patient and the blood component unit to be transfused are the same on the compatibility label attached to the pack and on the blood compatibility report form.
- Assisting in the investigation and reporting of transfusion reactions and other untoward incidents related to blood transfusion.
- Ensuring participation in the National Blood Stocks Management Scheme to monitor blood usage and wastage.
- Conducting laboratory audits.
- Adherence to Blood Safety and Quality Regulations.

5.9 **Drivers are responsible for:**
- Ensuring safe and timely (where possible) transportation of blood components around the province in the appropriate transport boxes.
6.0 Decision to Transfuse

Due to increasing concerns about the safety of transfusion, the increasing complexity and cost of the production of blood components and the shortage of blood donors, there is a need for sensible guidelines for the use of blood components.

The decision to transfuse must be made by a doctor or a non medical prescriber (an appropriately trained, competent and locally authorised registered practitioner) in accordance with recommended guidelines (Appendix 1 & Appendix 2) and the reason for the transfusion must be recorded in the patient’s case notes. It is imperative to avoid the unnecessary use of blood components. Therefore Blood Bank staff will query the appropriateness of requests for transfusion against the local guidelines for use of blood components. If the reason for the transfusion is unclear, clinicians will be encouraged to contact a Consultant Haematologist to discuss the blood component requirements.

It is generally considered best practice not to routinely transfuse patient’s overnight (8pm to 8am) due to an increased risk of errors and difficulties in monitoring and observing the patient at night.

6.1 Use of Red Cells

Red cell transfusion is indicated to increase the oxygen carrying capacity of the blood when acute or chronic anaemia contributes to inadequate oxygen delivery to tissues. For a 70kg adult, one unit of red cells will typically raise the venous haemoglobin concentration by about 10 g/l. Careful consideration is required when deciding on transfusion requirements for the low body weight patient. Ensure red cells are prescribed in accordance with the Regional Guidelines (Appendix 2).

6.2 Use of Platelets

Platelets play a primary role in the maintenance of haemostasis (i.e. the prevention of bleeding). Platelet transfusions are indicated for the prevention and treatment of haemorrhage in patients with thrombocytopenia or platelet function defects. For a 70kg adult, one adult dose of platelets will typically give an immediate rise in platelet count of 20 – 40 X 10^9 ml.

Platelets are not routinely stocked in the WHSCT and are ordered on request from the Northern Ireland Blood Transfusion Service (NIBTS).

6.3 Use of Fresh Frozen Plasma (FFP)

FFP is plasma that has been removed from whole blood donation and frozen within a specific time period after collection. FFP is indicated for treatment of thrombotic thrombocytopenia and for replacement of coagulation factors in a few specific situations. However, the indications for transfusing FFP are very limited and when transfused they can have unpredictable adverse effects. For a 70kg adult, 12 – 15ml/kg (4 units) would typically increase fibrinogen levels by about 1 g/l. Ensure FFP is prescribed in accordance with the Guidance on Use of Fresh Frozen Plasma and Cryoprecipitate (Appendix 3).
Imported FFP (methylene blue treated pathogen reduced) should be used for all recipients born on or after 1st January 1996 (i.e. those unlikely to have been exposed to BSE through diet) – this measure should continue, even when those recipients become 16 years old or more\(^\text{10}\).

### 6.4 Use of Cryoprecipitate

Cryoprecipitate is produced after freezing and thawing FFP to precipitate high molecular weight proteins and should be considered to replace fibrinogen and factor VIII when the fibrinogen result is less than 1.0g/l. Target fibrinogen level should be greater than 1.0g/l. Recommended dose is 2 pooled bags for an average sized adult\(^\text{7}\). Ensure Cryoprecipitate is prescribed in accordance with the Guidance on Use of Fresh Frozen Plasma and Cryoprecipitate (Appendix 3).

### 7.0 Emergency use of Red Cells

If there is a patient with a Major Haemorrhage, refer to the WHSCT Major Haemorrhage Protocol\(^\text{11}\).

#### 7.1 Issuing Group Specific Red Cells

When the situation warrants immediate action, and the risk of not transfusing outweighs the risk of waiting for a crossmatch, red cells of the patient’s ABO and Rh type (group specific red cells) can be provided in 15 minutes, provided the Blood Bank have a suitable accurately labelled sample available.

#### 7.2 Emergency Uncrossmatched O Rhesus D Negative Red Cells (Flying Squad)

Emergency Red Cells is Group O Rhesus D negative and has not been cross matched against the patient for transfusion. There are risks associated with transfusing uncrossmatched O Rhesus D negative red cells. Where the patient’s blood group is known and confirmed, it is safer to transfuse ABO Rhesus D compatible red cells (group specific red cells). Emergency O Rhesus D negative red cells must only be used when the patients’ condition indicates that there is no time to wait for group specific red cells (i.e. life threatening emergency).

A sample for group and screen must be taken from the patient prior to the infusion of the uncrossmatched O Rhesus D negative red cells.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Location</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altnagelvin</td>
<td>Satellite Blood Fridge, Recovery Area, Main Theatres</td>
<td>6</td>
</tr>
<tr>
<td>SWAH</td>
<td>Blood Bank Issue Fridge</td>
<td>2</td>
</tr>
<tr>
<td>Tyrone Co</td>
<td>Blood Issue Fridge, Cardiac Assessment Unit</td>
<td>6</td>
</tr>
</tbody>
</table>

#### 7.3 Using Emergency Uncrossmatched O Rhesus D Negative Red Cells (Flying Squad)

If it is necessary to use the emergency uncrossmatched O Rhesus D negative red cells the following procedure must be adhered to:

- Inform the Blood Bank when the emergency red cells are removed. This ensures the Blood Bank replaces the red cells for potential use elsewhere.
- Staff member completes details regarding date/time removed and prints staff name on the Blood Traceability Record(s) (Appendix 4).
- SWAH / Tyrone County – two units are in each Red and White Box in the Blood Issue Fridge with Blood Traceability Records in the pocket on the outside of the transport box (do not break seal on the box until the units are going to be transfused).
- Altnagelvin - place the unit(s) in the blue blood transport bag and place a cool pack on top of the unit (if more than two units being selected use the 4 or 6 unit boxes as appropriate. The blood transfer box should have the least air possible - i.e. fill all residual space with cool packs).
- Complete relevant documentation at Blood Issue Fridge regarding units removed.
- Take immediately to the clinical area and hand to a qualified member of staff.
- After the red cells have been transfused, the Blood Traceability Record should be completed with the patient’s details (first name, surname, date of birth, unique identification number) and returned to the Blood Bank to ensure full traceability of the used units.
- Should circumstances change and the emergency red cells are no longer required it should be returned to the Blood Issue Fridge within 30 minutes to prevent wastage (complete relevant documentation regarding date, time and details of staff member who returned unit).
- If the units are returned greater than 30 minutes after time of removal, do not place into Blood Issue Fridge – return to Blood Bank where Blood Bank staff will complete documentation indicating that unit was wasted (Tyrone County – place unit in quarantine drawer and telephone Blood Bank, SWAH).

8.0 Obtaining a venous sample for pre transfusion testing
Staff responsible for obtaining a venous sample for pre transfusion testing must be competent at venepuncture, have their knowledge on transfusion practice updated within the previous 18 months and have successfully completed Competency 1 ‘Obtaining a venous sample for pre transfusion testing’ within the last three years.

If you are interrupted or distracted at any stage during the checking procedure you should start again.

8.1 Completion of NI Hospital Transfusion Request Form (Appendix 5)
- Information required to be completed accurately (an addressograph label can be used on the request form) and legibly on the pre transfusion request form:
  - Unique Identification Number.
  - Patient’s surname.
  - Patient’s first name.
  - Patient Postcode.
  - Date of Birth.
  - Gender.
  - Consultant
  - Hospital.
  - Location of patient at time of request.
- Transfusion History (ask patient/check medical casenotes/check laboratory system) & Obstetric History. The patient may have developed antibodies as a result of previous transfusion or pregnancy and may suffer a secondary immune response if exposed again to the particular antigen. This information is of particular interest to the Blood Bank (if the patient was transfused in another Trust, these details would not be known to Blood Bank). If the details are not known, record ‘Unknown’.
- Test Request.
- Reason for Group and Screen.
- Date and time sample taken.
- Printed name and signature of staff member who took the sample (confirming that the patient identification details correspond to the details of the patient, the request form and the sample tube).
- Record staff number if applicable (Medical staff - record GMC number).

If a Group and Cross Match is required the following information is also required:
- Number of units, time and date required (if it is an emergency, ensure phone call to Blood Bank).
- Where red cells are ordered for surgery the Maximum Surgical Blood Order Schedule (MSBOS) (Appendix 6) should be adhered to. MSBOS is a schedule for the maximum provision of red cells for common operations requiring intraoperative blood transfusion and helps to improve stock management and wastage. However this does not preclude further red cells being requested in response to a specific clinical need.
- Any special requirements (e.g. Irradiated) (Appendix 7).
- Where blood component must be sent.
- Indication for red cell transfusion.
- Date and result of most recent Haemoglobin result.
- Printed name and signature of staff member requesting the blood component.

If additional blood components are required (and pretransfusion sample already in Blood Bank), complete the NI Hospital Transfusion Request Form regarding patient identification details and the product request section.

If the pre transfusion request form is not completed accurately, the sample will be rejected by Blood Bank.

Blood Bank staff have the discretion to request the clinician to discuss blood component requirements with a Consultant Haematologist prior to issue.

8.2 Obtaining the venous sample
- Positively identify the patient (who is capable of giving an accurate and reliable response) by:
  - Asking the patient for their first name, surname and date of birth.
  - Asking the patient to spell their name.
  - Confirming that these details match those on the patient’s identification wristband.
  - Confirming that the first name, surname, date of birth and unique identification number on the patient’s identification wristband corresponds with details on the pre transfusion request form.
For the patient unable to give an accurate and reliable response: -
- The patient’s first name, surname and date of birth and unique identification number must be identical to those on the patient’s identification wristband, case notes and the pre transfusion request form.
- Where possible confirm patient identity with another member of staff and/or patient’s carer or relative who can verify patient identification.

For the unidentified patient:
- The unique identification number and gender are the minimum patient identifiers.
- The unique identification number and gender must be identical to those on the patient’s identification wristband and the pre transfusion request form.
- Blood Bank must be informed at the earliest opportunity when the patient identification details become available (a repeat sample will also be required when the appropriate patient identification details are available).

Use a 6 ml EDTA blood transfusion tube.
Handwrite the sample tube at the patient’s bedside immediately after taking the sample taking the details from the patient’s identification wristband.
Label the sample tube with the patient’s first name, surname, date of birth, unique identification number, ward, gender and then sign and date.
Make a final check that the details on the patient’s identification wristband correspond with the pre transfusion request form and the sample tube.
Print name, sign, date and time the request form.
Record in the patient’s case notes why, when and who took the sample.
Take the sample to a designated collection point in the clinical area. If using a vacuum tube system, ensure you are correctly trained to use the system.

8.3 Important points relating to obtaining a sample for pre-transfusion testing
- All inpatients, outpatients, patients attending the A&E department and day-case patients must wear a patient’s identification wristband when they require a sample to be taken for pretransfusion testing.
- Only one patient must be bled at a time by a member of staff in a continuous uninterrupted process to minimise the risk of sample error.
- Samples for pretransfusion testing should not be taken from the arm that has an infusion in progress - this may result in a diluted sample being sent for testing or a spurious laboratory result being obtained.
- Sample tube should be correctly filled (at least 2 mls).
- Sample tubes must not be pre-labelled.
- All details must be handwritten legibly on the sample tube – addressograph labels must not be used on the sample tube.
- The sample tube must be handwritten by the person taking the sample immediately after the sample has been taken and at the patient’s bedside.
- It is essential to use the patient’s ‘official’ name and to spell the patient’s name correctly and consistently.
- Avoid using roller ball or fountain pen when recording details on sample tube.
- After the sample is taken, the blood should be mixed gently in the tube.
- If a patient poses a potential infection risk e.g. Category 3 status, their samples should be labelled accordingly.
• In an emergency situation, samples should be hand delivered to the Blood Bank and the staff member taking the sample should be aware of the urgency of the situation.
• Blood Bank must be contacted to alert them of the emergency.
• Samples that will be rejected – under-filled samples; haemolysed samples; inadequately/incorrectly labelled samples.
• Staff in Tyrone County Hospital should be aware of transport arrangements for delivery of pretransfusion samples (any queries, contact Blood Bank, Altnagelvin Hospital).

8.4 **Telephone Requests**
If sending a follow up request form for blood components please complete the following details on the NI Hospital Transfusion Request Form:
- Patient demographic details (first name, surname, date of birth, unique identification number).
- Location of patient.
- Number and type of blood components required (including any special requirements).
- The indication for the request.
- The date and time the blood component is required.
- Sign and date the bottom of the request form.

If requesting Blood Components with Blood Bank via telephone:
- A written record is kept in Blood Bank of all telephone requests including the identity of the person making the request and the person receiving the telephone request.
- The following information must be provided:
  - Patient’s surname, first name and unique identification number.
  - Location of patient.
  - Number and type of blood components required (including any special requirements).
  - The indication for the request.
  - The date and time the blood component is required.
  - Clinical area contact number.

When blood components have been requested from Blood Bank, it must be documented in the patient’s case notes to avoid duplication of request.

8.5 **Compatibility Testing**
**Group and Screen (or ‘Group and Hold’ or ‘Group and Save’)**
- The patient’s blood sample is tested to determine the ABO and RhD type and to detect red cell antibodies in addition to anti A or anti B that could haemolyse transfused red cells.
- This procedure takes approximately 25 minutes to perform following receipt of a correctly labelled sample.

**Group and Cross-Match**
- The patient’s blood is tested to determine the ABO and RhD type, to detect red cell antibodies that could haemolyse transfused red cells and to confirm compatibility with each of the units of red cells to be transfused.
This procedure takes approximately 45 minutes to perform following receipt of a correctly labelled sample - this will be longer if the patient has antibodies.

8.6 **Patient with antibodies**
- If, during antibody screening, a patient is found to have antibodies present, a process of antibody identification will be carried out.
- Further samples might be required to be sent to the Northern Ireland Blood Transfusion Service (NIBTS).
- Blood Bank should be informed of patients with known antibodies who are going to theatre, even if the usual MSBOS is group and screen only.
- The Blood Bank staff will advise on the availability/time required to provide compatible blood should it be required.

8.7 **Timing of Sample Collection In Relation To Previous Transfusions**
- Blood samples will be retained in the Blood Bank for 7 days.
- A cross match can be performed on a sample up to 7 days old if the patient has not been recently transfused.
- Cross matched blood will be ‘reserved’ for 72 hours.
- Transfusion or pregnancy may cause a primary or secondary immune response and samples selected for crossmatching or antibody screening must take account of this, so that newly developed antibodies are detected.
- When a patient is being repeatedly transfused, it is not necessary to submit a daily cross match sample. Such patients should be screened for the development of irregular antibodies at least every 72 hours (3 days).
- If a transfusion has been given more than 72 hours previously, a new sample is required according to the following guidance:-

<table>
<thead>
<tr>
<th>Patient transfused within:</th>
<th>Sample to be taken (maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 14 days</td>
<td>24 hours before transfusion</td>
</tr>
<tr>
<td>14 to 28 days</td>
<td>72 hours before transfusion</td>
</tr>
<tr>
<td>28 days to 3 months</td>
<td>1 week before transfusion</td>
</tr>
</tbody>
</table>

9.0 **Prescribing Blood Components**
- The BSQR excludes blood components from the legal definition of medicinal product. **The more correct term is ‘written authorisation’ of a blood component as opposed to ‘prescription’**. Blood components are not listed in the British National Formulary (BNF).
- Prescription (written authorisation) of blood components is the responsibility of medical staff or a non medical prescriber.
- The minimum data set which should be recorded in a patient’s clinical notes concerning transfusion of a blood component is:-
  a) The clinical indication for transfusion.
  b) A note that the risks, benefits and alternatives have been explained to the patient or parent / guardian.
  c) Recent full blood picture or coagulation test on which the decision to transfuse is based.
  d) Prescription for the blood component(s) transfused.
  e) Vital signs as per BCSH guidelines.¹²
f) Post transfusion note or repeat blood test to determine response to transfusion.

- Blood components must be prescribed on the Blood Component Prescription and Transfusion Record.
- The Blood Component Prescription and Transfusion Record must contain date, patient’s surname, first name, date of birth, gender and unique identification number.
- The prescription must state the blood component to be administered, quantity to be given and duration of the transfusion.
- Prescribing terminology that should be used for blood components: Red Cells; Fresh Frozen Plasma or FFP; Platelets and Cryoprecipitate.
- The transfusion of red cells must be completed within 4 hours of removal from controlled temperature storage. A red cell transfusion in this Trust should be prescribed over a clearly stated time period that lies between 1 ½ to 3 hours. An infusion rate of 3 hours is appropriate in frail elderly patients at risk of circulatory overload.
- Any special instructions e.g. any medication required before or during the transfusion must be indicated on the patient’s medicine kardex.
- Any special requirements e.g. gamma irradiated should be indicated on the prescription sheet.
- The prescription should be signed by the member of medical staff or a non medical prescriber.

Learning Point
- In a non-urgent situation, blood components must not be transfused that are not prescribed.

10.0 Consent to Transfusion
- Although gaining written consent for transfusion of blood components is not a legal requirement in the United Kingdom, there is a responsibility to ensure that the patient or parent / guardian receives adequate information regarding the transfusion.
- In planned circumstances, patients and parent / guardian should be provided with advance information and opportunity to ask questions about the risks and benefits of transfusion. They should also be informed about any suitable and available transfusion alternatives.
- This should be recorded in the Blood Component Prescription and Transfusion Record.
- Patients who are blood donors should be informed that they can no longer be a donor if they receive a transfusion of a blood component.
- Provide a patient information leaflet.
- For patients who are not willing to consent to transfusion, such as Jehovah’s Witnesses, adhere to the WHSCT Policy ‘Treatment of Patients who decline transfusion of Blood Components and/or Blood Products’.
- The beliefs of Jehovah’s Witnesses and any other patients resistant to transfusion should be acknowledged and respected.
- Consent issues should not delay necessary transfusion in an emergency situation.
In situations where it is not possible to obtain informed consent prior to the transfusion, e.g. emergency medical treatment in an unconscious patient, the patient or parent / guardian should be informed retrospectively of the clinical indication for and the associated risks and benefits of the transfusion.

11.0 Receipt of Blood Components into Satellite Blood Fridges

11.1 Satellite Blood Fridge, Altnagelvin (only used for storage of Red Cells)

- To access the Satellite Blood Fridge if no staff in Recovery, Bleep Theatre Nurse 8211.
- Porter delivers Red Cells (that have been appropriately packed by Blood Bank staff) from Blood Bank to Qualified Nurse in Recovery Area, main Theatres.
- Qualified Nurse ensures correct Blood Traceability Record with unit and then ‘stamps’ the back of the Blood Traceability Record and records name, date and time in for each unit placed in the Satellite Blood Fridge.
- Replace the Blood Traceability Record in the clear bag along with the unit of Red Cells.
- Place unit and cool packs in Satellite Blood Fridge.
- Process repeated for each unit placed into the Satellite Blood Fridge.
- Transport box placed on hooks near Satellite Blood Fridge for future use.

11.2 Blood Issue Fridge, Cardiac Assessment Unit, Tyrone County

- Driver delivers Blood Components to Cardiac Assessment Unit.
- Qualified Nurse removes the Special Delivery Form from the Transport Box and completes date and time and staff details when components received.
- Qualified Nurse removes unit(s) from Transport Box.
- A compatibility report and composite label will be available in the clear bag along with the first unit.
- Qualified Nurse ensures correct Blood Traceability Record with unit and then ‘stamps’ the back of the Blood Traceability Record and records name, date and time in for each unit placed in the Blood Issue Fridge (or in designated area if Platelets). PLATELETS ARE NEVER STORED IN A FRIDGE.
- Place the Blood Traceability Record in the clear bag along with the unit of Red Cells.
- Place Red Cell unit in Blood Issue Fridge; place Platelets back into Transport Box and leave in designated area.
- Process repeated for each unit received.
- Composite label placed on Laboratory Ledger and last 6 digits of unit number recorded under ‘Unit Number’.
- Special Delivery Form is faxed back to Altnagelvin Blood Bank.
- Cool packs and unused Transport Boxes left at allocated ‘Blood Collection Point’.
12.0 Organising a request for a Blood Component for transfusion

Staff responsible for organising a request for a Blood Component for transfusion must have their knowledge on transfusion practice updated within the previous 18 months and successfully completed Competency 2 ‘Organising a request for a Blood Component for transfusion’ within the last three years.

If you are interrupted or distracted at any stage during the checking procedure you should start again.

- Only one unit of red cells should be removed at a time for each patient unless extremely rapid transfusion of large quantities of red cells is required.
- Prior to organising a request for a Blood Component for transfusion ensure that:
  - Wherever possible, the reason for the transfusion has been explained to the patient or parent/guardian.
  - Wherever possible, the patient has been informed about possible adverse effects of transfusion and the importance of reporting immediately any symptoms.
  - The blood component is ready for collection.
  - The blood component has been prescribed and the reason for the transfusion has been recorded.
  - The patient has a patient identification wristband in situ.
  - The patient has baseline observations (temperature, pulse, respiration and blood pressure) taken and recorded. If these are not within normal limits for the patient, medical staff to be informed prior to requesting blood component.
  - The patient has patent venous access.
- Complete a Blood Collection Form (Appendix 8).
- Information required to be completed accurately and legibly on the Blood Collection Form: -
  - Unique Identification Number.
  - Patient’s surname.
  - Patient’s first name.
  - Date of Birth.
  - Gender.
  - Clinical Area.
  - Consultant.
  - Blood component required (indicating any special requirements) – this information should be taken from the Blood Component Prescription and Transfusion Record.
  - Details of individual completing the form (completed after the patient identification check has been undertaken).
- Positive identification of the patient (who is capable of giving an accurate and reliable response) is essential and must be based on the following: -
  - Ask the patient for their first name, surname and date of birth.
  - Asking the patient to spell their name.
  - Confirm that these details match those on the patient’s identification wristband.
- Confirm that the first name, surname, date of birth and unique identification number on the patient’s identification wristband corresponds with details on the Blood Collection Form.

- For the patient unable to give an accurate and reliable response: -
  - The patient’s first name, surname, date of birth and unique identification number must be identical to those on the patient’s identification wristband, case notes and the Blood Collection Form.
  - Where possible confirm patient identity with another member of staff and/or patient’s carer or relative who can verify patient identification.

- For the unidentified patient: -
  - The unique identification number and gender are the minimum patient identifiers.
  - The unique identification number and gender must be identical to those on the patient’s identification wristband and the Blood Collection Form.

- Identify an appropriate member of staff to collect the blood component.

- Ensure accurately completed Blood Collection Form delivered or brought to relevant area.

- Ensure the member of staff is aware of the exact location of the Blood Issue Fridge where the blood component is being stored.

- Where a vacuum shute system is available - in the event of failure of the vacuum shute system and a blood component is required in an emergency situation: -
  - Phone Blood Bank (9a.m. to 5p.m. Monday to Friday; or bleep BMS on call out of hours).
  - Inform member of staff in Blood Bank of the patient identification details (first name, surname, date of birth and unique identification number), blood component required and clinical area.
  - Porters should be informed to collect blood component from the Blood Bank.
  - The completed Blood Collection Form should be forwarded to the Blood Bank when the vacuum shute system is back in operation and marked ‘Already collected’.

13.0 Collecting a Blood Component for transfusion
(For collection of Emergency Uncrossmatched O Rhesus D negative Red Cells (see 7.0).

Staff responsible for collection of blood components must have completed training on ‘Collection of Blood Components’ within the last year and have successfully completed Competency 3 ‘Collecting a blood component for transfusion’ within the last three years.

If you are interrupted or distracted at any stage during the procedure you should start again.

- The staff member removing the Blood Component must have an accurately completed Blood Collection Form:-
  - Patient identification details – first name, surname, date of birth, unique identification number.
  - Blood component to be collected.
- Clinical area.
- Details of individual who requested the collection.

- If there are multiple units available for the same patient, the component that contains the Compatibility Report (Appendix 9) should be removed first.

- Select and remove the unit that has patient details on the compatibility tag attached to the blood component that fully match the patient details (first name, surname, date of birth and unique identification number) on the Blood Collection Form.

- Ensure correct component being removed as indicated on the Blood Collection Form.

- The patient details on the Blood Traceability Record and Compatibility Report (available with the first unit being collected - subsequent units will only have the Blood Traceability Record) must also match the Blood Collection Form.

- When satisfied that the ‘Right Blood’ for the ‘Right Patient’ has been removed as detailed on the Blood Collection Form, record the following details on the Laboratory ledger (not applicable at the Satellite Blood Fridge, Altnagelvin):
  - Last six digits of relevant unit number (BMS staff undertake this at Altnagelvin Blood Bank).
  - Date unit removed.
  - Time unit removed.
  - Initials of staff member removing unit.

- Print name and record date and time unit removed on the Blood Traceability Record (Satellite Blood Fridge, Altnagelvin and Tyrone County – record these details on the ‘stamper’ on the back of the Blood Traceability Record).

- Place the Blood Traceability Record and Compatibility Report (if first unit) into the clear bag along with the blood component.

- This process must be repeated for each unit removed.

- Leave Blood Collection Form in relevant folder/location.

- Where blue blood transport bags are used, place the Unit in the blue blood transport bag and place a cool pack on top of the unit (if more than two units being selected use the 4 or 6 unit boxes as appropriate. The blood transfer box should have the least air possible - i.e. fill all residual space with cool packs).

- Staff member will take immediately to the requesting correct clinical area and hand the blood component to a qualified member of staff (or in theatres to an appropriate member of staff).

- Qualified member of staff in clinical area confirms that correct component for correct patient is delivered against appropriate documentation.

- Complete relevant section ‘Receipt of Unit in Clinical Area by:’ on Blood Traceability Record – print name, date and time received.

- Blood components must never be left unattended.
13.1 Additional information on Collection of Blood Components
- Red cells are never stored in a ward or drugs refrigerator and must only be transported in boxes designed for the purpose.
- Only one unit should be removed for a patient at a time. (Exception may be for theatre patients or in an extreme emergency when a rapid transfusion is needed – in which case a validated transport box must be used.) In this situation, one Blood Collection Form would suffice that indicates the number of components required.
- Altnagelvin - Monday to Friday (9a.m. to 5p.m.) excluding Bank Holidays, the Biomedical Scientists (BMS) informs the Porters (or Support Services Assistant, Renal Unit) that a blood component is required to be delivered to a clinical area. The BMS ensures the correct component is removed, the Porter (or Support Services Assistant, Renal Unit) completes ‘Removal of Unit from Blood Bank’ section of the Blood Traceability Record and the BMS completes relevant sections on the Blood Bank register.
- Satellite Blood Fridge, Altnagelvin – To access the Satellite Blood Fridge if no staff in Recovery, Bleep Theatre Nurse 8211. After removal of the blood component, the Blood Collection Form is placed into the designated folder on top of the Satellite Blood Fridge.

14.0 Pre Transfusion Identification Checks
Staff responsible for preparing and administering a transfusion of a blood component must have had their knowledge on transfusion practice updated within the previous 18 months and successfully completed Competency 4 ‘Preparing and administering a transfusion of a blood component’ within the last three years.

Note the compatibility form and patient’s case notes play no part in the pre transfusion patient identification checks

If you are interrupted or distracted at any stage during the checking procedure you should start again.

- Two qualified members of staff will perform the checks separately and independently and agree the result.
- The following check must be undertaken at the patient’s bedside: -
  - Confirm that the blood component has not expired and that it will not expire during the transfusion episode (midnight of the expiry date if Red Cells or Platelets).
  - Check blood component for signs of discolouration, haemolysis, leaks or clumping.
- Positive identification of the patient (who is capable of giving an accurate and reliable response) is essential and must be based on the following: -
  - Ask the patient for their first name, surname and date of birth.
  - Asking the patient to spell their name.
  - Confirm that these details match those on the patient’s identification wristband.
  - Confirm that the first name, surname, date of birth and unique identification number on the patient’s identification wristband corresponds with details on the prescription chart and the compatibility label attached to the unit pack.
For the patient unable to give an accurate and reliable response:
- The patient’s first name, surname and date of birth and unique identification number must be identical to those on the patient’s identification wristband, case notes, the prescription chart and the compatibility label attached to the unit pack.
- Where possible confirm patient identity with another member of staff and/or patient’s carer or relative who can verify patient identification.

For the unidentified patient:
- The unique identification number and gender are the minimum patient identifiers.
- The unique identification number and gender must be identical to those on the patient’s identification wristband, the prescription chart and the compatibility label attached to the unit pack.

Confirm that the blood group and unit number on the blood component label details, attached by the Transfusion Service, corresponds with the blood component compatibility label attached by the Blood Bank.

All documentation (Blood Component Prescription and Transfusion Record, Compatibility Report and Blood Traceability Record) pertaining to the blood transfusion episode must be matching before staff complete signatures.

Check any special requirements contained in the Blood Component Prescription and Transfusion Record correspond with special requirements indicated on the blood component compatibility label attached by the Transfusion Service.

The compatibility report form will be used as part of the Blood Component checking procedure (as this should include and specify any special requirements) and then completed with the following details - date, start time and signature of the two members of staff undertaking the check.

Blood Traceability Record documentation should be completed (print name, date and time when transfusion commenced) and returned to Blood Bank as soon as possible after the commencement of the transfusion. Full traceability from vein to vein, donor to patient is required.

If there are any discrepancies found during the course of the bedside check, the blood component should not be transfused and advice must be sought from the Blood Bank.

If no discrepancies are found during the above procedures and baseline observations have been taken and recorded, the blood component can be erected. This must be done by one of the staff members involved in the above pre transfusion checking procedure.

The compatibility report form must be readily available during the transfusion episode. When the transfusion of the component is completed the report must be kept in the patient’s medical notes as a permanent record of the transfusion. This policy recommends that the compatibility report form is attached to the relevant section on the ‘Blood Component Prescription and Transfusion Record.’
15.0 **Observations during transfusion of a Blood Component**

- This policy recommends the use of the ‘Blood Component Prescription and Transfusion Record.’
- The following observations are the minimum acceptable standard to be undertaken and recorded for the transfusion of each blood component:
  - Pulse, blood pressure, temperature and respirations before the commencement of the transfusion.
  - Pulse, blood pressure, temperature and respirations 15 minutes after the commencement of the transfusion.
  - Pulse, blood pressure, temperature and respirations at the end of the transfusion.
- Further observations are at the discretion of the clinical area (dependent on clinical condition, level of consciousness, inability to communicate adverse effects).
- These observations must be repeated for each blood component transfused.
- Visual observation of the patient throughout the transfusion is essential (ensure call bell available if appropriate for patient).
- A doctor and/or qualified nurse is responsible for informing the patient about possible adverse effects of transfusion and the importance of reporting immediately any adverse effects. Adverse effects include:
  - Pyrexia
  - Headache
  - Shivering
  - Chest tightness
  - Rashes
  - Hypotension
  - Flushing
  - Anxiety/restlessness
  - Shortness of breath
  - Pain in the extremities or in the loin
  - Tachycardia
  - Any other change to patient’s condition since transfusion commenced.

### Learning Point

- Nurses should monitor the rate of transfusion and fluid balance as these factors influence the risk of a patient developing TACO (Transfusion Associated Circulatory Overload).

16.0 **Administration of a Blood Component**

- Red cells, FFP and Cryoprecipitate must be transfused through a sterile blood administration giving set (incorporates a mesh filter 170-200 micron pore size). A standard blood or platelet administration set must be used for the transfusion of platelet components. Platelets must not be transfused through giving sets that have been used for red cells or plasma components – a new giving set must be used.
- Prior to the commencement of the blood component transfusion EITHER – prime the blood administration set with an intravenous infusion of 0.9% sodium chloride (if this is required it must be prescribed and checked according to the Trust intravenous fluid policy) OR flush the venous access with 5 to 10mls of 0.9% sodium chloride.
0.9% Sodium Chloride is the only solution that should be used to flush the blood administration set before or after the transfusion of a blood component.

The start and finish times of each blood component transfused must be clearly recorded on the Blood Component Prescription and Transfusion Record.

It is imperative that all paperwork pertaining to the transfusion episode is checked and completed accurately.

Adverse reactions may manifest many hours after the transfusion is completed. Therefore, patients, such as day cases, discharged within 24 hours of a transfusion should be given the advice sheet ‘Advice for patients who are discharged within 24 hours of a Blood Component Transfusion’ (Appendix 10).

16.1 **Additional Information regarding Platelet Transfusion**

- Platelets must never be stored in a refrigerator.
- Platelets are continually agitated in Blood Bank (to prevent them aggregating) therefore on arrival at the clinical area commence as soon as possible.
- A sterile platelet administration giving set should be used. If this is not available a sterile blood administration giving set may be used, provided it has not previously been used for the administration of red cells.
- Maximum infusion time 30 minutes.

16.2 **Additional Information regarding Fresh Frozen Plasma (FFP) & Cryoprecipitate Transfusion**

- Take baseline coagulation screen (though may need to use before results are available).
- Requires approximately 30 minutes thawing time in Blood Bank from request received in Blood Bank.
- Must be transfused through a sterile blood administration giving set.
- Start infusion immediately upon arrival to the clinical area.
- Maximum infusion time 30 minutes.
- FFP – must be transfused within 4 hours of being thawed if stored at room temperature (can be kept for up to 24 hours in controlled temperature storage in Blood Bank).
- Cryoprecipitate – if delay of commencement unavoidable, must be stored at ambient temperature and transfused within 4 hours of being thawed.

17.0 **Technical Aspects in the Administration of a Blood Component**

- Transfusion of red cells should commence within 30 minutes of removal from controlled cold chain storage and must be completed within 4 hours of removal from controlled cold chain storage.
- If a transfusion of red cells has to be disconnected temporarily e.g. problem with venous access, the blood administration giving set must be replaced prior to recommencing the transfusion using an Aseptic Non Touch Technique (ANTT). The transfusion must be completed within 4 hours of removal from controlled cold chain storage. If this is not possible, the red cells remaining in the pack after the 4 hour period should be discarded (see 18.0).
- If a patient has to be transferred to another ward within the same hospital:
  - The patient should be stable from the blood transfusion perspective.
  - Do not stop the transfusion for the purpose of the transfer.
  - Do not transfer the patient until after the first 15 minutes of the transfusion.
  - Ensure the patient is escorted by a qualified member of staff.
- There is extensive clinical experience of safely administering red cell units to stable patients over a period of 90 minutes for each unit. In situations such as massive haemorrhage where rapid red cell replacement is required a unit may be transfused in under 5 minutes using rapid infuser devices.
- Electronic infusion pumps may damage red cells, and must only be used for the administration of red cells if there is manufacturer verification that they are safe to use for this purpose. The administration set used must be suitable for the administration of blood components and is recommended for the type of infusion pump that is being used.
- There is no minimum or maximum size of cannula for transfusion. The size of the cannula chosen should depend on the size of the vein and the speed at which the blood component is to be transfused. For patients with short-term or indwelling multi-lumen central lines, these are usually suitable for the transfusion of blood components. Where possible, one lumen should be reserved for administering blood components.
- Red cells are not routinely warmed. The routine use of blood warmers in adult patients undergoing rapid or high volume transfusion of red cells in the context of major haemorrhage and blood warmers are also appropriate in the transfusion of patients with clinically significant cold antibodies. Red cells must only be warmed using approved, specifically designed and regularly maintained blood warming equipment with a visible thermometer and audible warning.
- Red cells for transfusion must be stored in a validated designated alarmed blood fridge at a stable temperature of 4°C ± 2°C. Red cells throughout its transportation and storage should be maintained at 4°C ± 2°C using validated “cool boxes” which are required to maintain the cold chain. If a unit of red cells has been out of temperature control for more than 30 minutes and there is no prospect of its imminent transfusion the unit must be returned to Blood Bank and Blood Bank informed of this.
- Drugs must not be added to blood components under any circumstance.
- A new giving set must be used:
  - After 12 hours of continuous transfusion in order to prevent bacterial growth.
  - If another infusion is to continue after the transfusion.
Learning Points 1
Transfusion should only take place if there are significant competent staff available to monitor the patient and the patient can be readily observed throughout the transfusion episode.
- Transfusion should only be performed where there are facilities to recognise and treat anaphylaxis.
- TACO (Transfusion-Associated Circulatory Overload) can occur after transfusion of small volumes of red cells, even \( \leq 1 \) unit.
- In those patients predisposed to TACO careful assessment must be made of their pre-transfusion fluid balance status and the tolerable rate of transfusion. Doctors should undertake pre-transfusion clinical assessment, taking into account concomitant medical conditions that increase the risk of TACO (cardiac failure, renal impairment, hypoalbuminaemia, fluid overload) and consider diuretic cover (e.g. Furosemide).
- In patients with modest but ongoing blood loss, frequent monitoring of the Hb is essential.

18.0 Completing the Transfusion of a Blood Component
- Undertake and record pulse, blood pressure, temperature and respirations at the end of the transfusion.
- Record the time of completion on the ‘Blood Component Prescription and Transfusion Record.’
- At the end of the transfusion, EITHER – prime the blood administration set with an intravenous infusion of 0.9% sodium chloride (if this is required it must be prescribed and checked according to the Trust intravenous fluid policy) OR flush the venous access with 5 to 10mls of 0.9% sodium chloride.
- If the transfusion is completed uneventfully, discard the empty blood component pack and administration set into a yellow lid burn box in the clinical area.
- Only retain the empty pack if the patient has had a transfusion reaction or a suspected transfusion reaction or if the patient had any other adverse outcome – this will be sent back to Blood Bank – see 19.0.
- If the patient is for another unit, insert the blue plug to the port where the blood administration set was inserted on the blood component pack and discard the empty blood component pack into a yellow lid burn box in the clinical area.
- Where a blood component has been transfused partially, for reasons other than a suspected transfusion reaction, the blood component pack with the remaining contents and the giving set should be disposed as one unit into the yellow lid burn box.
- Any unused blood components must be returned to the Blood Bank as soon as possible.
- If the transfusion runs over its prescribed time the doctor must be informed.
- All paperwork involved (Blood Component Prescription and Transfusion Record and Compatibility Report Form) must be filed in the patient’s notes.
19.0 Managing and reporting of Adverse Reactions/Events

- Management of an Acute Transfusion Reaction (Appendix 11).
- Complications of Transfusion (Appendix 12).
- Adverse blood reactions and events must be reported by law to the Medicines and Health Care Products Regulatory Agency (MHRA) – the reporting system is known as SABRE (Serious Adverse Blood Reactions and Events).
- Inform Blood Bank of adverse reactions/events.
- The Haemovigilance Practitioner will complete online reporting to SHOT/SABRE following discussion of adverse reactions/events with the Hospital Transfusion Team.
- If a transfusion reaction is suspected a member of the medical staff must be contacted immediately. The patient’s temperature, pulse, blood pressure and respirations must be recorded.
- If a severe transfusion reaction is suspected:
  - The transfusion must be stopped and urgent medical advice obtained.
  - The blood administration set must be changed and venous access maintained using normal saline, running slowly to keep the vein open.
  - The reaction must be reported immediately to the Blood Bank.
  - The unit and patient identification details must be re-checked to ensure that the patient is receiving the correct unit.
  - Any blood component remaining in the pack and the administration set must be returned to the Blood Bank for testing. Blood and urine samples from the patient will be required by Blood Bank.
  - Complete and return the ‘Suspected Transfusion Reaction Form’ to Blood Bank at time of event (Appendix 13).
- A qualified nurse is responsible for ensuring that vital signs are monitored – a doctor must issue instructions on their frequency.
- The volume and colour of any urine passed must be recorded.
- If a severe reaction is suspected, medical advice from a Consultant Haematologist must be sought.

20.0 Record Keeping

- A permanent record of the blood components transfused must be kept in the patient case notes i.e. the Blood Component Prescription and Transfusion Record with the compatibility report attached in the relevant section on the Record.
- A post transfusion note or repeat blood test to determine response to transfusion.
- Details regarding the occurrence and management of any adverse reaction/event.

21.0 Return of unused Blood Components

Any unused Platelets, FFP or Cryoprecipitate must be returned to the relevant Blood Bank.

If a unit of Red Cells is returned within 30 minutes of time of removal:

1. Take unit of Red Cells back to the designated Blood Issue Fridge.
2. On the Blood Traceability Record print name and record date and time when the unit of Red Cells has been returned to the Blood Issue Fridge.
3. Complete the Blood Bank Register (not applicable Satellite Blood Fridge, Altnagelvin) regarding the date, time and staff initials against the unit number of the unit being returned.

If a unit of Red Cells is being returned greater than 30 minutes of time of removal or any other Blood Component being returned – DO NOT PLACE INTO THE DESIGNATED BLOOD ISSUE FRIDGE:

1. Take Blood Component back to the Blood Bank. In Tyrone County - place unit in quarantine drawer and telephone Blood Bank, Altnagelvin to inform them that a unit has been returned and to be wasted.
2. On the Blood Traceability Record in the section ‘Unit not used in Clinical Area’ – staff member in Blood Bank must Print Name and record date and time when the Blood Component was returned and complete box indicating that the unit was wasted.
3. Staff member in Blood Bank completes the Blood Bank Register -
   • Date, time and initials against the unit number of the returned unit.

22.0 Multiple units of Red Cells being collected from Blood Bank

If multiple units of Red Cells for a patient are being collected at the one time from the Blood Bank, a transport box must be used. These transport boxes have been locally validated to maintain red cells at 4±2°C for a maximum of 2 hours, i.e. red cells can remain in the sealed transport box for 2 hours. Documentation pertaining to the transfusion (Blood Traceability Records & Compatibility Report) will be located in the pocket on the front of the box – the seal of the box does not need to be broken to check documentation.

Once the tamperproof seal is broken, the time must be documented on the attached tag (Appendix 14) and all units must be transfused within 4 hours of the time the seal was broken or returned to the designated Blood Issue Fridge within 30 minutes of the time the seal was broken if the units are not going to be transfused.

Transport box for multiple units
23.0 Receiving blood components transferred from another Hospital
Red cells received from another hospital must be taken to the Blood Bank immediately and handed directly to a member of staff. Biomedical Scientists (BMS) will determine the integrity of the units and if they can or cannot be used.

24.0 Transferring red cells with a patient to another Hospital

Blood should only be transferred if anticipated to be used during transfer.

- If unused during the transfer, the red cells will most probably be discarded by the receiving Hospital unless the red cells are taken directly to the Blood Bank and the packaging has remained sealed.
- Ambulance personnel are not permitted to transfuse a patient.
- Most receiving hospitals prefer to use blood that has been group & crossmatched by their own Blood Bank.
- As soon as a decision to send red cells has been made Blood Bank should be contacted immediately.
- Inform Blood Bank staff regarding patient information, expected time of transfer and expected destination of patient.
- Blood Bank staff will pack the red cells in a transport box with a seal attached and provide relevant paperwork in pocket at front of box.
- Blood Bank staff will fax the Blood Bank at the receiving hospital and give patient and blood component details.
- If the red cells are not required in transit do not break the seal on the transport box.
- If the red cells are required, the accompanying doctor/nurse (who has been trained and competently assessed as per the NPSA Safer Practice Notice ‘Right Patient, Right Blood’) must follow the proper blood administration procedure.
- On arrival at the receiving hospital, inform the clinical team that the unused red cells must be transferred to the Blood Bank as soon as possible.

25.0 Additional Information regarding Home Transfusions by the Rapid Response Nursing Team
It is imperative that Home Transfusions are undertaken in a safe and efficient manner. It may be appropriate for patients to receive transfusion of a blood component within the community setting. Where this is required, the Rapid Response Team will be actively involved.

When undertaking Home Transfusions, Registered Nursing Staff must carry an emergency drug pack of adrenalin and be familiar with the Trust protocol and administration information for use of adrenalin in the event of an emergency.

25.1 Patient Selection
- Prior to the case being taken on by the Rapid Response Nursing Team, the patient must have safely completed a blood transfusion in the hospital environment in the previous 6 months.
• Patient requires maintenance blood transfusions for symptomatic relief for palliative care or haematological conditions, which will enable the patient to remain at home whilst having ongoing disease management.
• Patient must be able to confirm their identity verbally or if unable to do so then a relative will be asked to do so.
• Where possible, patient must have hand washing facilities available and a landline telephone. The Rapid Response Nursing Team must have access to their mobile phones (although it is acknowledged that they may not always have a signal).
• A Registered Nurse must stay with the patient for the duration of the transfusion and for 30 minutes after completion of the transfusion.
• Patient will be given the advice sheet ‘Advice for patients who are discharged within 24 hours of a Blood Component Transfusion’ (Appendix 10) or if they regularly receive a Home Transfusion the patient will be reminded of the procedure to follow if they become unwell after the transfusion.

25.2 Obtaining a venous sample for pre-transfusion testing (see 8.0)
The Registered Nurse will obtain the details pertaining to the patient demographics either verbally from source of referral, from the Blood Component Prescription and Transfusion Record or from the referral management system. The information pertaining to transfusion history and test request will be obtained from the referring source or the Laboratory system.

25.3 Organising a request for a Blood Component for Transfusion (12.0)
An accurately completed (first name, surname, date of birth and unique identification number) Blood Component Prescription and Transfusion Record or Blood Component Prescription Sheet must be brought to the designated Blood Issue Fridge to collect a Blood Component.

25.4 Collecting a Blood Component for Transfusion (See 13.0)
Prior to collecting the Blood Component, a member of the Rapid Response Nursing Team will contact the relevant Blood Bank to ascertain the time that the Blood Component will be available.

An accurately completed (first name, surname, date of birth and unique identification number) Blood Component Prescription and Transfusion Record or Blood Component Prescription Sheet must be used when removing a Blood Component from the designated Blood Issue Fridge.

Transport Boxes
If collecting red cells from a designated Blood Issue Fridge, a member of the Rapid Response Nursing Team will bring with them one or two CliniMed Blood Transport Box and Medicool cool packs. Platelets must be transported at room temperature. A member of the Rapid Response Nursing Team will go to the designated Blood Issue Fridge with a CliniMed Blood Transport Box – no cool packs required.

Once the blood component has been collected from the Blood Issue Fridge, it must be transported in the boot of the vehicle.
Multiple unit transfusions in the home setting

When a patient requires multiple unit red cell transfusion (e.g., two units) in the home setting and the units are being collected from Blood Bank at the same time, the following criteria must be adhered to:

- Each unit must be packed appropriately in separate transport boxes.
- The transport box is an extension of the cold chain, i.e., the seal on both transport boxes must remain intact to ensure the red cells are stored at the correct temperature. The unit of red cells is only removed from the transport box immediately prior to commencement of the transfusion.
- For the first unit - once the transport box has been opened the transfusion must be completed within 4 hours.
- For the second, third unit etc – all units must be completed within 6 hours of the unit of red cells being removed from Blood Issue Fridge (time as stated on the Blood Traceability Record).
- If the patient’s condition changes and the transfusion is no longer required all unused units of red cells must be returned to the Blood Issue Fridge for final fate to be recorded.

25.6 Pre Transfusion Identification Checks (See 14.0)

As a minimum, one registered healthcare professional, competency assessed to NPSA SPN 14 standards must perform the checking / administration procedure (BCSH, 2009). This happens routinely in out of hospital transfusions. The Hospital Transfusion Team (HTT) within the WHSCT has agreed single person checking is permissible in the out of hospital transfusion setting. This individual must be a Registered Nurse who has had their knowledge on transfusion practice updated within the previous 18 months and successfully completed Competency 4 ‘Preparing and administering a transfusion of a blood component’ within the last three years.

Monitor baseline observations prior to opening the transport box to avoid wastage of units if the observations are abnormal and a decision is taken not to commence the transfusion. If any of the baseline observations are abnormal, contact the General Practitioner or referring Consultant to ascertain if it is safe to continue with the transfusion.

25.7 Completing the transfusion of a Blood Component (See 18.0)

The compatibility report must be readily available during the transfusion episode. When the transfusion of the component is completed the report must be photocopied and the original is sent to the consultant’s secretary for filing in the patient’s hospital notes as a permanent record of the transfusion. The photocopy of the compatibility form is attached to the relevant section of the Blood Component Prescription and Transfusion Record and filed in the patient’s nursing notes.

25.8 Managing and reporting of Adverse Reaction / Events (See 19.0)

Any abnormalities observed should be reported to the Team Leader and a member of medical staff contacted immediately. If a severe reaction is suspected out of the acute hospital setting, the transfusion must be stopped and urgent medical advice sought by calling for the Emergency Ambulance 999 to transfer the patient to hospital. The Rapid Response Nurse will monitor the patient’s vital signs and prepare the adrenalin syringe for administration if the patient’s condition deteriorates rapidly whilst awaiting the emergency services.
26.0 Blood Products

- Blood products are any therapeutic product derived from human whole blood or plasma donations. As plasma from any single donor could introduce infectious agents into the batch, scrupulous attention is paid to testing for transmissible viruses and steps are taken to inactivate viruses during processing. However, no blood product can be guaranteed to be ‘risk free’.
- Since Blood Products do not contain red cell antigens or significant red cell antibodies, compatibility is not an issue. All plasma derivatives are blood products and their administration, including all batch numbers and expiry dates, should be carefully documented.
- Blood Bank should be contacted in the event of any adverse reactions to blood products and a Yellow Card must also be completed.
- When blood products are required from Blood Bank, a NI Hospital Transfusion Request Form must be completed with patient details and product request and then sent to Blood Bank.
- The rates of infusion, storage of the product, administration route and any necessary re-constitution of the product are to be found in the package insert.
- Observations for blood products are as for medicines, not as for Blood Components, and frequency of observations are dictated by medical staff and the patient’s condition.

26.1 Anti D Immunoglobulin

- Is prepared from human plasma containing high levels of anti-D antibody. The Blood Bank holds a stock of relevant doses. The product is stored at 4°C, in the dark, and is issued to named patients on request.
- Anti D prophylaxis is offered to all non-sensitised pregnant women who are Rhesus D negative. The treatment is required to prevent women producing anti D antibodies, which might cause Haemolytic Disease of the Newborn (HDN) in future pregnancies. HDN in its worse form may result in stillbirth or infants with severe disabilities.
- Refer to manufacturer’s instructions in relation to administration guidelines.
- Delayed or omission of Anti D administration must be reported to Blood Bank.

26.2 Human Albumin Solutions (5% or 20%)

- Is a protein found naturally in the blood which is needed for many different functions. Human albumin is produced from pooled donor plasma with the final product being sterilised by filtration and heat treatment.
- Is indicated to restore and maintain circulating blood volume where volume deficiency has been demonstrated, and use of a colloid is appropriate.
- Does not require to be infused through a blood administration giving set with a filter. A standard intravenous infusion giving set is suitable.
- The usual dose for administration is decided by the medical staff involved in the patient’s care and is determined by the patient’s condition and response to treatment.
- Any unused albumin not given to a patient should be returned as soon as possible to the Blood Bank.
- Occasionally causes anaphylactic reactions and patients should be monitored carefully.
26.3 **Immunoglobulins (IgG)**
- Are the antibodies produced by B-lymphocytes in response to infection. Immunoglobulins are therefore important for the correct functioning of the immune system, fighting bacterial infections, neutralising viruses and activating the complement systems.
- Are given when the patient fails to make adequate antibodies or as protection against particular infections. In other instances they are used to modify the way in which the patient’s immune system is working, usually by ‘blocking’ the action of other harmful antibodies.
- NIBTS should be informed of all new patients requiring IgG.
- Are supplied by NIBTS on a named basis only.
- The doses used vary according to the indication. The weight and height of the patient must be recorded to assist the clinician in determining the dose required for the patient.
- Infusion rates are given in the product data sheets and it is important that these are not exceeded. The infusion is started slowly and gradually increased to a maximum infusion rate in the absence of any reactions.
- Must be prescribed on the Medicine Kardex.

26.4 **Prothrombin Complex Concentrate**
- May be required to ensure the appropriate management of patients who have life threatening haemorrhage and are on warfarin. Rapid anticoagulant reversal is required when there is life threatening haemorrhage, trauma or prior to emergency surgery.
- Should be used in conjunction with vitamin K.
- Recording the weight of the patient is important when determining dose required for the patient.
- Is contraindicated in patients with DIC or uncompensated liver disease.
- Octaplex is the Prothrombin Complex Concentrate available for use within the WHSCT. Octaplex is available from Blood Bank on a named patient basis only.
- Refer to manufacturers instructions in relation to the administration guidelines.

26.5 **Recombinant Factor VIIa (Novoseven) (rFVIIa)**
- Is an initiator of thrombin generation. It works directly with tissue factor at the site of a haemorrhage to accomplish haemostasis (clotting). It has been shown that it may be more effective if used earlier in the course of bleeding.
- Refer to manufacturers instructions in relation to the administration guidelines.
- The decision to use this product must have the approval of two Consultants who are actively involved with the Haemorrhaging patient.
- Use of Novoseven is continually audited - relevant documentation must be completed and returned to Blood Bank if Novoseven is used.
## 27.0 Summary of Blood Components

<table>
<thead>
<tr>
<th>Blood Component</th>
<th>Giving Set</th>
<th>Transfusion Time</th>
<th>Storage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Red Cells</strong></td>
<td>Blood Administration Giving Set.</td>
<td>Commence within 30 minutes of removal from controlled temperature storage. Transfusion duration 2 - 3 hours. Must be completed within 4 hours from removal from controlled temperature storage.</td>
<td>4° +/- 2°C in an approved, alarmed blood storage fridge only (has controlled temperature monitoring).</td>
<td>Shelf life 35 days. If infusion pumps used, they must be used according to manufacturer’s instructions. Minimum observations baseline, 15 minutes after commencement and at end of transfusion.</td>
</tr>
<tr>
<td><strong>Platelets</strong></td>
<td>Blood / Platelets Administration Giving Set. Do not use a Giving Set that has been previously used for red cells.</td>
<td>Transfusion duration 30 minutes. Use as soon as delivered to clinical area.</td>
<td>Stored at room temperature with constant agitation in Blood Bank. Never should be placed in a fridge.</td>
<td>Shelf life 5 days. If infusion pumps used, they must be used according to manufacturer’s instructions. Minimum observations baseline, 15 minutes after commencement and at end of transfusion.</td>
</tr>
<tr>
<td><strong>Fresh Frozen Plasma (FFP)</strong></td>
<td>Blood Administration Giving Set.</td>
<td>Transfusion duration 30 minutes. Post thaw storage results in a decline in the content of labile coagulation factors.</td>
<td>Stored at &lt; -25°C. Thawed FFP may be stored for 24hr in a temperature controlled fridge in Blood Bank, but must be transfused within 4 hrs if taken to clinical area. Takes approximately 30 minutes to thaw in Blood Bank. Take coagulation sample before FFP is transfused. If infusion pumps used, they must be used according to manufacturer’s instructions. Minimum observations baseline, 15 minutes after commencement and at end of transfusion.</td>
<td></td>
</tr>
<tr>
<td><strong>Cryoprecipitate</strong></td>
<td>Blood Administration Giving Set.</td>
<td>Transfusion duration 30 minutes.</td>
<td>Stored at &lt; -25°C. When thawed must be stored at ambient temperature. Must be transfused within 4 hrs if taken to clinical area. Takes approximately 30 minutes to thaw in Blood Bank. If infusion pumps used, they must be used according to manufacturer’s instructions. Minimum observations baseline, 15 minutes after commencement and at end of transfusion.</td>
<td></td>
</tr>
</tbody>
</table>
## 28.0 Summary of Blood Products
All Blood Products are issued to named patients only

<table>
<thead>
<tr>
<th>Blood Product</th>
<th>Giving Set</th>
<th>Infusion Rate</th>
<th>Storage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>Standard intravenous infusion giving set</td>
<td>Infusion rate as per individual circumstances</td>
<td>Between 2°C and 25°C</td>
<td>Must be used within 3 hours of opening</td>
</tr>
<tr>
<td>Anti D</td>
<td>N/A</td>
<td>N/A</td>
<td>Between 2°C and 8°C</td>
<td>Administered by I.M. injection (must be within 72 hours for Potentially Sensitising Event)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dosage as per Routine Antenatal Anti-D Prophylaxis (RAADP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Refer to product information leaflet regarding preparation</td>
</tr>
<tr>
<td>Immunoglobulin</td>
<td>Standard intravenous infusion giving set</td>
<td>Infusion rates as per clinicians advise</td>
<td>Between 2°C and 8°C</td>
<td>Dose used depends on clinical condition, weight &amp; height of patient</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Refer to product information leaflet regarding preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Must be prescribed on the medicine kardex</td>
</tr>
<tr>
<td>Prothrombin Complex Concentrate</td>
<td>N/A</td>
<td>Refer to Package insert</td>
<td>Below 25°C (not to be frozen)</td>
<td>Octaplex used in WHSCT - issued on named patient basis only</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Used in conjunction with vitamin K</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Discuss dose with Consultant Haematologist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Refer to product information leaflet regarding preparation</td>
</tr>
<tr>
<td>Novoseven</td>
<td>N/A</td>
<td>Refer to Regional Guidelines on Trust Intranet</td>
<td>Between 2°C and 8°C</td>
<td>Refer to information on Trust Intranet - use outside licensed indications not recommended.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Refer to package insert regarding dose and preparation</td>
</tr>
</tbody>
</table>
**BLOOD COMPONENT ADMINISTRATION (ADULTS)**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>All blood components</td>
<td>- All blood components should be administered using a blood component administration set which incorporates a 170 – 200 micron filter</td>
</tr>
</tbody>
</table>
| Red Cells | - **Dose:** 4ml/kg (equivalent to 1 unit per 70kg adult) typically raises Hb concentration by about 1g/dl  
- All red cell units should be transfused within 4 hours of removal from designated temperature controlled storage  
- For routine administration, there is extensive experience of safely administering a red cell unit over 90-120 minutes per unit  
- Patients less tolerant of increased blood volume should be transfused more slowly with careful haemodynamic monitoring. For some patients it may be appropriate to give a diuretic (e.g. furosemide 20 to 40mg orally), though this is not necessary as a routine  
- During major haemorrhage, rapid infusion (1 unit over 5-10 minutes) may be required (with appropriate clinical and haemodynamic monitoring) |
| Platelets | - **Dose:** 1 adult therapeutic dose (ATD) typically increases the platelet count by at least 20-40 x 10^9/ml  
- Platelet concentrates should not be transfused through administration sets which have already been used to administer other blood components  
- The infusion should be commenced as soon as possible after the component arrives in the clinical area  
- **Typically administered over 30-60 minutes per adult therapeutic dose (ATD)** |
| FFP (Fresh Frozen Plasma) | - Prior to the transfusion FFP must be thawed under controlled conditions using specifically designed equipment. Thawing usually takes approximately 15-30 minutes  
- Once thawed, FFP must not be re-frozen and should be transfused as soon as possible. Post thaw storage will result in a decline in the content of labile coagulation factors  
- If stored at 22 ±2 °C post thawing, the transfusion must be completed within 4 hours of thawing  
- If stored at 4 ±2 °C post thawing (in a designated temperature controlled refrigerator), the transfusion must be completed within 24 hours of thawing (NBS 2007)  
- Pooled solvent-detergent treated plasma is also commercially available  
- **Dose:** typically 10-15ml/kg. This dose may need to be exceeded in massive haemorrhage depending on the clinical situation and its monitoring (BCSH 2004)  
- **Typical infusion rate 10-20ml/kg/hr (approximately 30 minutes per unit)**  
- Rapid infusion may be appropriate when given to replace coagulation factors during major haemorrhage. There is anecdotal evidence that acute reactions may be more common with faster administration rates |
| Cryoprecipitate | - Prior to the transfusion cryoprecipitate must be thawed under controlled conditions using specifically designed equipment. Thawing usually takes approximately 15-30 minutes  
- Once thawed, cryoprecipitate must not be re-frozen and should be used immediately. If delay is unavoidable, the component must be stored at ambient temperature and used within 4 hours  
- **Dose:** typical adult dose is two five-donor pools (equivalent to 10 single donor units) which would raise the plasma fibrinogen level by about 1g/l  
- **Typically administered at 10-20ml/kg/hr (or 30-60 minutes per 5 unit pool)** |
Northern Ireland Transfusion Committee

Red Cell Transfusion Guidelines\textsuperscript{14}

- Always diagnose the cause of anaemia.
- Treat reversible causes of anaemia.

<table>
<thead>
<tr>
<th>Stable Patients</th>
<th>Transfusion Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 65 years old with no cardiovascular or cerebrovascular problems</td>
<td>Usually only consider transfusion when Hb &lt; 7 g/dl</td>
</tr>
<tr>
<td>&lt; 65 years old with no cardiovascular or cerebrovascular problems</td>
<td>Usually only consider transfusion when Hb &lt; 8 g/dl</td>
</tr>
<tr>
<td>Known cardiovascular or cerebrovascular history (previous myocardial infarction, angina, hypertension, heart failure, peripheral vascular disease pulmonary oedema)</td>
<td>Usually only consider transfusion when Hb &lt; 9 g/dl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients with symptoms due to anaemia</th>
<th>Transfusion Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unstable patients bleeding heavily</td>
<td></td>
</tr>
<tr>
<td>Impaired marrow function</td>
<td></td>
</tr>
<tr>
<td>Symptoms (dyspnoea, angina, palpitations, tachycardia, orthostatic hypotension, syncope) likely to be due to the anaemia</td>
<td>Consider transfusion when Hb &lt; 10 g/dl</td>
</tr>
</tbody>
</table>

\textit{Note – Tiredness alone is not an appropriate symptom for transfusion}

| Documented / obvious evidence of ongoing significant bleeding at time of transfusion causing symptoms as above or bleeding more than 500 ml per hour and not stopping | Consider transfusion when Hb < 10 g/dl |

| Current or recent (within 3 months) marrow failure or chemotherapy or radiotherapy | Consider transfusion when Hb < 10 g/dl |

- Patients should only be transfused to a target of 2.0 g/dl haemoglobin in excess of the chosen threshold for transfusion above.

- Overtransfusion is similar to inappropriate transfusion as units of blood are given to a patient exposing them to the risks of unnecessary transfusion. This has been defined as an Hb more than 2 g/dl above the defined transfusion threshold.

- Consider patient’s estimated blood volume and any ongoing bleeding.
Appendix 3

Guidance on use of Fresh Frozen Plasma (FFP) & Cryoprecipitate
(amended version of NITC, 2009)

Contact a clinical haematologist sooner rather than later if you have any concerns.

Definition of coagulopathy
Deficiency of one or more coagulation factors, evident as:
- Abnormal coagulation screen (PT, APTT > 1.5 X normal)
- Microvascular bleeding

Indications for FFP transfusion
Coagulopathy with bleeding
or
Coagulopathy prior to an invasive procedure, which carries a risk of haemorrhage.

Coagulopathy could be attributed to:
- Liver disease
- DIC
- Surgical / trauma induced bleeding

Indications for Cryoprecipitate transfusion
Plasma fibrinogen < 1g/L with bleeding
or
Plasma fibrinogen < 1g/L prior to an invasive procedure, which carries a risk of haemorrhage.

In massive blood loss anticipate requirement for:
- FFP if blood loss exceeds 1 blood volume
- Cryoprecipitate if blood loss exceeds 1.5 times blood volume

FFP transfusion:
1. Confirm criteria for transfusion
2. Request from Blood Bank 1 therapeutic dose for an adult, child or neonate -
   - 12 - 15 ml / kg body weight
   [1 unit of FFP contains 300 ml - on average 4 units would provide one therapeutic dose for a 70kg adult]
3. Send a baseline coagulation screen to Haematology
4. Allow 30 minute thaw time for FFP
5. Transfuse through blood administration set within 4 hr of thawing
6. Check coagulation screen for response.

Cryoprecipitate transfusion:
1. Confirm criteria for transfusion
2. Give 1 therapeutic dose:
   - Adult: 2 pooled bags
   - Child or neonate: 2 ml/kg body weight of single donor units
   [1 single donor unit contains 20-40 ml cryoprecipitate]
3. Check serum fibrinogen (coagulation screen) for response.

Aim to stop bleeding, rather than to normalise coagulation screen

FFP is NOT indicated in the following situations:
- Reversal of warfarin induced coagulopathy in the absence of bleeding or when Prothrombin Complex Concentrate is available
- Correction of coagulopathy in the absence of bleeding or anticipated peri-operative blood loss
- Volume or plasma expansion in adults or children
### Appendix 4 – Blood Traceability Record

#### Western Health & Social Care Trust - Blood Traceability Record

<table>
<thead>
<tr>
<th>Unit Number:</th>
<th>This Record must be returned to Blood Bank upon commencement of the transfusion.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Details</strong></td>
<td>A transfusion of a unit of Red Cells must be completed within 4 hours of time unit removed from Controlled Temperature Storage.</td>
</tr>
<tr>
<td>Unique Identification Number:</td>
<td>A unit of Red Cells must not be put back into a Blood Fridge if out longer than 30 minutes.</td>
</tr>
<tr>
<td>First Name:</td>
<td></td>
</tr>
<tr>
<td>Surname:</td>
<td></td>
</tr>
<tr>
<td>Date of Birth:</td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
</tr>
<tr>
<td>Clinical Area:</td>
<td></td>
</tr>
</tbody>
</table>

#### Removal of Unit from Blood Bank

- **Within the last 3 years I have been certified as competent in 'Collecting a blood component for transfusion'**
- **DATE**
- **TIME**

#### Staff Name (PRINT CLEARLY):

**[Insert Name]**

#### Commencement of Transfusion

- **Within the last 3 years I have been certified as competent in 'Preparing and administering a transfusion of a blood component'**
- **DATE**
- **TIME**

#### Staff Name (PRINT CLEARLY):

**[Insert Name]**

#### Unit Released in Clinical Area

- **Within 30 minutes, placed into blood fridge by (PRINT CLEARLY):**
- **DATE**
- **TIME**

- **Not within 30 minutes, accepted into Blood Bank by (PRINT CLEARLY):**
- **DATE**
- **TIME**

- **Unit returned to stock [ ]**
- **Unit wasted [ ]**
Appendix 5 – NI Hospital Transfusion Request Form

NI HOSPITAL TRANSFUSION REQUEST FORM

Please print clearly.

[Form fields for patient information, transfusion requests, and laboratory comments are filled out with details]

TRANSFUSION HISTORY & TEST REQUEST

Blood Group (If known) _____________________________ Atypical Antibodies (If known) _____________________________

Previous transfusions: Yes [ ] No [ ] If yes, date of most recent transfusion _____________________________

Previous reactions: Yes [ ] No [ ]

Previous pregnancies: Yes [ ] No [ ] Anti-D given recently (within 12 weeks)? Yes [ ] No [ ]

Group & Antibody screen (held for 7 days): Yes [ ] No [ ] Reason for group & antibody screen _____________________________

Direct Antiglobulin Test (Coomb's Test): [ ]

I confirm that the patient identification details correspond to the details of the patient and the sample tube.

Within the last 3 years, I am certified as competent in core competency in obtaining a venous sample for pre-transfusion testing.

Signature _____________________________ Date __________

The above section MUST be signed by the person taking the sample, failure to do so will result in the sample being rejected.

PRODUCT REQUEST

Components Red Cells Platelets FFP Cryo. Other Product Requests

No. of Units

SPECIAL REQUIREMENTS

CMV neg (CMV) [ ] Irradiated (RR) [ ] Methylmercury Blue Treated [ ]

INDICATION FOR RED CELL TRANSFUSION

Age < 65 years, Hb < 7g/dl

Age > 65 years, Hb < 8g/dl

Cardiac / cerebrovascular symptoms, Hb < 8g/dl

Significant haemorrhage > 500ml / hour

Bone Marrow failure syndromes, Hb < 10g/dl

Patient on Chemotherapy, Hb < 10g/dl

Symptomatic anaemia, Hb < 10g/dl

Massive Transfusion protocol (Please contact blood bank immediately)

Surgery: state operation / MSB/CS below

FFP, Platelets, Cryo: state reason for request

Most recent Hb result & date

Required for: Date _____________ Time _____________ Deliver to _____________________________

PRINT

Signature _____________________________

Product requests will not be processed unless the above section is completed and signed.

For emergency requests, FFP, Platelets or Cryoprecipitate please telephone / fax blood bank.
<table>
<thead>
<tr>
<th>Procedure</th>
<th>MSBOS</th>
<th>G5S</th>
<th>G6S</th>
<th>G7S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Femoral Osteotomy and Reattachment</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (Open)</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (Ligament Tensioning)</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (Massive)</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (Non-Massive)</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (List)</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (List) (Open)</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (List) (Ligament Tensioning)</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Femoral Osteotomy and Reattachment (List) (Massive)</td>
<td>6 units</td>
<td>6 units</td>
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<tr>
<td>Femoral Osteotomy and Reattachment (List) (Non-Massive)</td>
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</tr>
<tr>
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</tbody>
</table>
Appendix 7

**Indications for ‘Special’ Blood Components**

The Blood Bank laboratory system can store historic patient information relating to patients who require special requirements. This can act as a back-up system, but it is important that clinical staff are aware that the responsibility for ensuring that patient's with special requirements receive the appropriate blood components remains with the person making the request.

**CMV-Antibody-Negative Components**

Cytomegalovirus is a common herpes virus which causes chronic symptom-free infection in most adults, but may have more serious consequences for some specific patient groups.

SaBTO has reviewed the evidence around the replacement of CMV seronegative cellular blood components (both red cells and platelets) with leucodepleted blood components. The DHSSPS have reviewed this advice and the following conclusions were reached:

1. CMV seronegative red cell and platelet components should be provided for intrauterine transfusions and for any baby up to the chronological age of 20 weeks. (As the expected date of delivery is not known to the Blood Bank, this allows for the maximum period of prematurity, i.e. 16 weeks, plus four weeks neonatal period.)

2. CMV seronegative blood components should be provided where possible for pregnant women, regardless of their CMV serostatus, who require repeat elective transfusions during the course of pregnancy (not labour and delivery). This mainly applies to patients with haemoglobinopathies who are managed in specialist centres. However CMV seronegative blood components are not expected to be generally available in all hospitals and therefore for emergency transfusions in pregnant women, leucodepleted components are recommended.
Irradiated Blood Components

Transfusion-Associated Graft-Versus-Host Disease (TA-GvHD) is a very rare but usually fatal complication of transfusion of any blood component containing viable T lymphocytes when there is disparity in the histocompatibility antigens between donor and recipient\textsuperscript{17}.

Indications for Irradiated Components\textsuperscript{17}:

1. All donations from first- or second-degree relatives should be irradiated, even if the patient is immunocompetent.
2. All human leucocyte antigen (HLA)-selected components should be irradiated, even if the patient is immunocompetent.
3. All blood for intrauterine transfusion (IUT) should be irradiated. It is essential to irradiate blood for neonatal exchange transfusion (ET) if there has been a previous IUT or if the donation comes from a first- or second-degree relative. For other neonatal ET cases, irradiation is recommended provided this does not unduly delay transfusion. For IUT and ET, blood should be transfused within 24 hours of irradiation and, in any case, by 5 days or less from collection.
4. Platelets transfused in utero to treat alloimmune thrombocytopenia should be irradiated and any subsequent red cell or platelet transfusions irradiated until 6 months after the expected date of delivery (40 weeks gestation). There is no need to irradiate other platelet transfusions for pre-term or term infants, unless they have been donated by first- or second-degree relatives.
5. All severe T lymphocyte immunodeficiency syndromes should be considered as indications for irradiation of cellular blood components. Once a diagnosis of immunodeficiency has been suspected, irradiated components should be given while further diagnostic tests are being undertaken. A clinical immunologist should be consulted for advice in cases where there is uncertainty.
6. All recipients of allogeneic haemopoietic stem cell transplantation (SCT) must receive irradiated blood components from the time of initiation of conditioning chemoradiotherapy. This should be continued while the patient continues to receive graft-versus-host disease (GvHD) prophylaxis, i.e. usually for 6 months post-transplant, or until lymphocytes are >1 \cdot 10^9/l. If chronic GvHD is present or if continued immunosuppressive treatment is required, irradiated blood components should be given indefinitely. Allogeneic blood transfused to bone marrow and peripheral blood stem cell donors 7 d prior to or during the harvest should also be irradiated.
7. Patients undergoing bone marrow or peripheral blood stem cell ‘harvesting’ for future autologous re-infusion should receive irradiated cellular blood components during and for 7 days before the bone marrow/stem cell harvest to prevent the collection of viable allogeneic T lymphocytes which can potentially withstand cryopreservation.
8. All patients undergoing autologous bone marrow transplant or peripheral blood stem cell transplant should receive irradiated cellular blood components from initiation of conditioning chemo/radiotherapy until 3 months post-transplant (6 months if total body irradiation was used in conditioning).

9. All adults and children with Hodgkin lymphoma at any stage of the disease should have irradiated red cells and platelets for life.

10. Patients treated with purine analogue drugs (fludarabine, cladribine and deoxycoformycin) should receive irradiated blood components indefinitely. The situation with other purine antagonists and new and related agents, such as bendamustine and clofarabine, is unclear, but use of irradiated blood components is recommended as these agents have a similar mode of action. Irradiated blood components should be used after alemtuzumab (anti-CD52) therapy. Their use after rituximab (anti-CD20) is not recommended at this time. As new potent immunosuppressive drugs and biological agents are introduced into practice there is a need for regular review of these recommendations.

11. In view of the recent switch from horse anti-thymocyte globulin (ATG) to the more immunosuppressive rabbit ATG, we now recommend use of irradiated blood components for aplastic anaemia patients receiving immunosuppressive therapy with ATG (and/or alemtuzumab). We cannot make a firm recommendation as to how long irradiated components should continue to be used after ATG administration.

It is not necessary / there is no indication for routine irradiation for the following:

1. Routine ‘top-up’ transfusions of premature or term infants unless either there has been a previous IUT, in which case irradiated components should be administered until 6 months after the expected delivery date (40 weeks gestation), or the donation has come from a first- or second-degree relative.

2. Infants or children who are suffering from a common viral infection, who are human immunodeficiency virus (HIV) antibody positive, or who have acquired immunodeficiency syndrome (AIDS). However, this should be kept under review. There is also no indication for routine irradiation of cellular blood components for adults who are HIV antibody positive or who have AIDS.

3. Infants undergoing cardiac surgery unless clinical or laboratory features suggest a coexisting T lymphocyte immunodeficiency syndrome.

4. Adults or children with acute leukaemia, except for HLA-selected platelets or donations from first- or second-degree relatives.

5. Patients undergoing routine surgery, those with solid tumours, HIV infection, autoimmune diseases or after solid organ transplantation (unless alemtuzumab (anti-CD52) has been used in the conditioning regimen). The effects of new regimens of chemo- and immunotherapy entering clinical practice must continue to be monitored.
**WESTERN HEALTH & SOCIAL CARE TRUST**

**BLOOD COLLECTION FORM (Northern Sector)**

Please complete a Blood Collection Form for every Blood Component/Product required (other than Emergency O Negative Blood)

<table>
<thead>
<tr>
<th>Patient Details:</th>
<th>(If using addressograph label, please indicate clinical area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique Identification Number:</td>
<td></td>
</tr>
<tr>
<td>First Name &amp; Surname:</td>
<td></td>
</tr>
<tr>
<td>Date of Birth:</td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
</tr>
<tr>
<td>Clinical Area:</td>
<td></td>
</tr>
<tr>
<td>Consultant:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood Component/Product Required:</th>
<th>Irradiated</th>
<th>CMV Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Cells</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>Platelets</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>Fresh Frozen Plasma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
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</tr>
</tbody>
</table>

**Blood Collection Form completed by:**

1) I confirm that the patient identification details correspond to the details of the patient and the patient identification wristband.

2) Within the last 3 years I have been certified as competent in 'Organising a request for a Blood Component for Transfusion'

**Name:** [PRINT]

<table>
<thead>
<tr>
<th>Position:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature:</td>
<td>---</td>
</tr>
<tr>
<td>Clinical Area:</td>
<td>---</td>
</tr>
<tr>
<td>Date:</td>
<td>---</td>
</tr>
<tr>
<td>Time:</td>
<td>---</td>
</tr>
</tbody>
</table>

**9am - 5pm** send in vacuum system to Blood Bank, **code 870**, then follow up phone call to Blood Bank

**Out of Hours** send in vacuum system to Post Room, **code 120**, then follow up phone call to Porters

**Waterside Hospital** send to Blood Bank with pretransfusion sample or with Driver.

Ensure follow up phone call to Blood Bank
### ALTNAGELVIN HOSPITAL LABORATORY (TEL: 3376)

**Patient:** KNIFE  
**Address:** DRILL STREET WORKTOWN  
**D.O.B.:** 31/10/1943  
**Sex:** M  
**Location:** ONCOLOGY OPD

<table>
<thead>
<tr>
<th>Blood Group</th>
<th>AB Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibody Screen</td>
<td>No Atypical antibodies detected</td>
</tr>
</tbody>
</table>

**Product:** FILTERED CELLS

I have verified that the patient’s NAME, DoB, UNIT NUMBER AND BLOOD GROUP have been checked as per local blood transfusion policy.

**Issued on:** 10/1/2012 at 3:40 PM  
**0161 811 245 646 V AB Positive Exp. 16/01/12**

**Sign:** Date... Time...

Transfusion must commence within 30 mins of removal of unit from fridge.

---

**Blood Bank Cross Match**

<table>
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<tr>
<th>Specimen Type</th>
<th>Sample Date/Time: REPORT Date/Time: 10/01/2012 15:41</th>
</tr>
</thead>
<tbody>
<tr>
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<td>REPORT Date/Time: 10/01/2012 15:41</td>
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</table>
Appendix 10 – Advice Sheet for Patients who are discharged within 24 hours of a Blood Component Transfusion

<table>
<thead>
<tr>
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<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Date of Birth:</td>
<td></td>
</tr>
<tr>
<td>Unique Identification Number:</td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
</tr>
<tr>
<td>Ward:</td>
<td></td>
</tr>
<tr>
<td>Consultant:</td>
<td></td>
</tr>
</tbody>
</table>

**Advice for Patients following a Blood Component Transfusion**

The majority of blood component transfusions take place without problems but having a transfusion carries with it a very small risk of developing side effects. These may develop within several hours, or in some cases may happen days or weeks later. These side effects are often mild, but it is still important to report any unusual or unexpected symptoms to a Doctor, Nurse or Midwife.

Please contact the hospital for advice if you experience any of the following after having a blood component transfusion:

- A high temperature – feeling feverish, hot and clammy
- Shivering or ‘cold chills’
- Breathing problems
- Extreme tiredness
- Passing blood in your urine
- Passing much less, or very dark, urine
- Itchy skin rash
- Pain in the lower back (loin pain)
- Unexpected or unexplained bruising
- Jaundice (yellow colour of the white of your eyes or your skin)

When contacting the hospital for advice, please inform the hospital staff that you have recently had a blood component transfusion.

This section must be completed by staff if the patient is discharged within 24 hours of receiving a transfusion. Explain to the patient how to obtain assistance in the event of a problem (both ‘in hours’ and ‘out of hours’), and then give this form to the patient before they leave the Ward/Department.

**Ward/Department: ................................................

**Contact numbers:**
Monday to Friday (9am – 5pm): .................................................................
Monday to Friday (after 5pm), Weekends & Bank Holidays.............................

**Date and Time of last transfusion:** ............................................................

**Blood Components transfused:** ........................................................................

If you are unable to make contact with the hospital where you had your Transfusion, then please contact your GP as soon as possible.

In the rare event of an emergency (life threatening problems, for example difficulty with breathing), call 999 for an ambulance and bring this leaflet into hospital with you.

If you would like further information or advice about this, or other aspects of blood component transfusion, please discuss this with your Hospital Doctor, Nurse or Midwife.
Appendix 11 - Recognition, initial management and subsequent management and investigations of Acute Transfusion Reactions

Policy for Blood Component Transfusion in Adults
Appendix 12 – Guideline on the investigation and management of acute transfusion reactions

Summary of Key Recommendations

Recognition of acute transfusion reactions (ATR)

- Initial treatment of ATR is not dependent on classification but should be directed by symptoms and signs. Treatment of severe reactions should not be delayed until the results of investigations are available.
- All patients should be transfused in clinical areas where they can be directly observed, and where staff are trained in the administration of blood components and the management of transfused patients, including the emergency treatment of anaphylaxis.
- The recognition and immediate management of ATR should be incorporated into local transfusion policies and there should be mandatory transfusion training requirements for all clinical and laboratory staff involved in the transfusion process.
- Patients should be asked to report symptoms which develop within 24 hours of completion of the transfusion.

Immediate management of ATR

- If a patient develops new symptoms or signs during a transfusion, this should be stopped temporarily, but venous access maintained. Identification details should be checked between the patient, their identity band and the compatibility label of the blood component. Perform visual inspection of the component and assess the patient with standard observations.
- For patients with mild reactions, such as pyrexia (temperature of > 38°C and rise of 1-2°C), and/or pruritus or rash but without other features, the transfusion may be continued with appropriate treatment and direct observation.
- Patients with mild isolated febrile reactions may be treated with oral paracetamol (500-1000mg in adults). Patients with mild allergic reactions may be managed by slowing the transfusion and treatment with an antihistamine.
- Anaphylaxis should be treated with intramuscular adrenaline (epinephrine) according to UKRC guidelines. Patients who are thrombocytopenic or who have deranged coagulation should also receive intramuscular adrenaline if they have an anaphylactic reaction.
- If a patient being transfused for haemorrhage develops hypotension, careful clinical risk assessment is required. If the hypotension is caused by haemorrhage, continuation of the transfusion may be life-saving. In contrast, if the blood component is considered the most likely cause of hypotension, the transfusion must be stopped or switched to an alternative component and appropriate management and investigation commenced.
- If a patient develops sustained febrile symptoms or signs of moderate severity (temperature > 39°C or a rise of > 2°C and/or systemic symptoms such as chills, rigors, myalgia, nausea or vomiting), bacterial contamination or a haemolytic reaction should be considered.
Laboratory Investigations

- In all moderate and severe transfusion reactions, standard investigations, including full blood count, renal and liver function tests and assessment of the urine for haemoglobin should be performed.
- If febrile symptoms of moderate severity are sustained implicated units should be returned to the laboratory for further investigation, the blood service contacted immediately so that associated components from the implicated donation can be withdrawn and the patient sampled for repeat compatibility and culture.
- Patients who have experienced moderate or severe allergic reactions should have IgA levels measured. Low levels found on screening, in the absence of generalised hypogammaglobulinaemia, should be confirmed by a more sensitive method and IgA antibodies should be checked. Patients with IgA deficiency diagnosed after an ATR should be discussed with an allergist or immunologist regarding future management.
- In the absence of platelet or granulocyte transfusion refractoriness, or acute post-transfusion thrombocytopenia or leucopenia, investigation of the patient with ATR for leucocyte, platelet or neutrophil-specific antibodies is not indicated.

Subsequent management of the patient

- Patients who have experienced an anaphylactic reaction associated with transfusion must be discussed with an allergist or immunologist, in keeping with UKRC guidelines.
- For patients with recurrent febrile reactions, we recommend a trial of premedication with oral paracetamol given one hour before the reaction is anticipated (or non-steroidal anti-inflammatory drugs in patients with predominant chills or rigors - but an assessment of the risks of medication against the severity of reaction should be made in each case). Patients who continue to react should have a trial of washed blood components.
- For recurrent mild allergic reactions, there is no evidence to support routine prophylaxis with antihistamines or steroids. Alternative causes such as allergy to drugs or latex gloves should be excluded.
- For patients with recurrent moderate or severe allergic reactions, other than those in which the patient is IgA deficient, options for further transfusion include:
  - Use of directly monitored transfusion of standard components in a clinical area with resuscitation facilities. Consider antihistamine prophylaxis (although the evidence for efficacy is low, the risks are also low). This may be the only option when further transfusion is urgent and withholding blood is a greater risk.
  - Transfusion of washed red cells or platelets.
  - The use of pooled solvent-detergent treated FFP when there are recurrent allergic reactions to FFP in patients undergoing plasma exchange.
- Patients with confirmed IgA deficiency and a history of reaction to blood should be transfused with components from IgA-deficient donors (first choice) or washed red cells (second choice) if time allows.
• Life-saving transfusion should not be denied or delayed if these are not immediately available but the facilities and skills to manage severe allergic reactions must be present.
• Patients with known IgA deficiency (IgA <0.07g/l) and no history of reactions to blood must be assessed on an individual basis, taking into account the urgency of transfusion, the indication for IgA testing, the anticipated frequency of transfusion and history of allergy/anaphylaxis in other settings. Most will receive standard components without problems, but discussion with a transfusion medicine or clinical immunology or allergy specialist is advisable if time allows.

**Reporting of ATR**
• All transfusion reactions except mild febrile and/or allergic reactions must be reported to appropriate regulatory and Haemovigilance organisations (MHRA and SHOT) and should also be reviewed within the hospital.

**Investigation of Moderate or Severe Acute Transfusion Reactions**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Investigations</th>
</tr>
</thead>
</table>
| Fever (>2°C rise or 39°C), and/or chills, rigors, myalgia, nausea or vomiting and/or loin pain | Standard investigations.*
Take samples for repeat compatibility testing, DAT, LDH and Haptoglobin.
Take blood cultures from patient.
Coagulation screen.
Do not discard implicated unit.
**If febrile reaction sustained**, return unit to laboratory, repeat serological investigations (compatibility testing, antibody screen and DAT), haptoglobin and culture unit.
**If loin pain**, perform serological investigations as above. |
| Mucosal swelling (angiooedema)                                          | Standard investigations.*
Measure IgA level (EDTA sample)- if <0.07g/L, and no generalised hypogammaglobulinaemia, perform confirmatory test with sensitive method and check for IgA antibodies. |
| Dyspnoea, wheeze, or features of anaphylaxis                             | Standard investigations.*
Check oxygen saturation or blood gases.
Chest X-ray (mandatory if symptoms severe).
If severe or moderate allergy suspected measure IgA level.
If severe allergy/anaphylaxis suspected, consider measurement of serial mast cell tryptase (plain tube) (immediate, 3 h and 24 h). |
| Hypotension (isolated fall systolic of 30 mm resulting in level 80mm)   | Investigate as for fever.
If allergy suspected measure IgA level.
If severe allergy/anaphylaxis consider measurement of serial mast cell tryptase, as above. |

*Standard investigations: full blood count, renal and liver function tests, and assessment of urine for haemoglobin

**Abbreviations:**
- DAT - direct antiglobulin test
- Ig – immunoglobulin
- LDH – lactate dehydrogenase

Appendix 13
**Investigation of Moderate or Severe Acute Transfusion Reactions**

Altnagelvin/Tyrone County - contact Altnagelvin Blood Bank 213829/213830; SWAH - contact SWAH Blood Bank 252421/252290

1. Please complete the following details:

<table>
<thead>
<tr>
<th>Unique Identification Number</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Surname</td>
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<td></td>
</tr>
<tr>
<td>First Name</td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<tr>
<td>Ward</td>
<td></td>
<td></td>
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<tr>
<td>Consultant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of Event</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of Event</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. *Please forward the following to the Laboratory department:*
   - Donor pack causing reaction complete with blood administration giving set (in sealed plastic bag) – **Blood Bank**
   - Group & Screen (Post transfusion) – **Blood Bank**
   - Full Blood Count – **Haematology**
   - Liver Function Test – **Biochemistry**
   - Urea & Electrolytes – **Biochemistry**
   - Urine for haemolysis (First MSSU post reaction) – **Microbiology**
   - Blood Cultures – **Microbiology**
   - Coagulation Screen - **Haematology**

3. Medical Staff responsible for the patient to complete the following:

<table>
<thead>
<tr>
<th>PATIENT HISTORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Transfusion</td>
</tr>
<tr>
<td>Reason for Current Transfusion</td>
</tr>
<tr>
<td>Pretransfusion Haemoglobin</td>
</tr>
<tr>
<td>If Female Patient, Pregnancy History</td>
</tr>
<tr>
<td>If ‘Yes’ Number of Pregnancies</td>
</tr>
<tr>
<td>Previous Abortion</td>
</tr>
<tr>
<td>Previous Miscarriages</td>
</tr>
<tr>
<td>Atypical Antibodies</td>
</tr>
<tr>
<td>Previous Transfusion Reactions</td>
</tr>
</tbody>
</table>

PLEASE TURN OVER AND COMPLETE SECOND PAGE.
<table>
<thead>
<tr>
<th>Symptoms of Reaction (adapted from BCSH, 2012)</th>
<th>Yes</th>
<th>No</th>
<th>If ‘Yes’ additional investigations required as well as those indicated on Page 1*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever (≥ 2°C above baseline or ≥ 39°C) and/or chills, rigors, myalgia, nausea or vomiting and/or loin pain</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Mucosal swelling (angiooedema)</td>
<td></td>
<td></td>
<td>Measure IgA level (yellow top EDTA sample tube) – if &lt; 0.07g/L, &amp; not generalised hypogammaglobulinaemia, perform confirmatory test with sensitive method and check for IgA antibodies.</td>
</tr>
</tbody>
</table>
| Dyspnoea, wheeze or features of anaphylaxis   |     |    | - Check oxygen saturation or blood gases.  
- Chest x ray (mandatory if symptoms severe).  
- If severe/moderate allergy suspected, measure Serum Immunoglobulins (? IgA deficiency).  
- If severe allergy/anaphylaxis suspected, consider measurement of serial Mast Cell Tryptase (yellow top serum sample tube) - immediate, 3hrs & 24 hrs. |
| Hypotension (isolated fall systolic of ≥ 30mm resulting in level ≤ 80mm) |     |    | - Investigate as for fever.  
- If allergy suspected measure Serum Immunoglobulins (? IgA deficiency).  
- If severe allergy / anaphylaxis consider measurement of serial mast cell tryptase as above. |

- Blood Pack Unit associated with reaction

<table>
<thead>
<tr>
<th>TRANSFUSION HISTORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Group</td>
</tr>
<tr>
<td>Rhesus D Group</td>
</tr>
<tr>
<td>Unit Number</td>
</tr>
<tr>
<td>Expiry Date</td>
</tr>
<tr>
<td>Date unit taken from Blood Bank</td>
</tr>
<tr>
<td>Time unit taken from Blood Bank</td>
</tr>
<tr>
<td>Time transfusion commenced</td>
</tr>
<tr>
<td>Time transfusion discontinued</td>
</tr>
<tr>
<td>Number of units already transfused during this admission</td>
</tr>
<tr>
<td>Unit number of all other packs transfused during this admission</td>
</tr>
<tr>
<td>Anything injected into the blood component pack or giving set? Yes/No</td>
</tr>
<tr>
<td>Approximate volume of blood transfused _____________ mls</td>
</tr>
</tbody>
</table>

Signature ________________  Designation ________________
Print Name ______________  GMC/Staff Number __________
Date ________________  Time ________________

PLEASE ENSURE THAT BOTH PAGES ARE COMPLETED.
Appendix 14 - Tamperproof Seal and Tag used when units packed in a Sealed Transport Box

BLOOD FOR URGENT ATTENTION

DELIVER TO:

TIME PACKED:

DATE:

While the yellow seal is intact the contents of this transport box are in cold chain compliance for a maximum of 2 hours

TIME SEAL BROKEN:

DATE:

Once the yellow security tag has been broken the 30 minute rule becomes effective.

i.e. the units must be either:

- Transfused
- Placed in the Satellite Blood Fridge
- Returned to Blood Bank
30.0 References

10. Health Service Letter HSS (MD) 13/2012 Use of Imported Fresh Frozen Plasma (FFP) to treat those born on or after 1st January 1996 and adult patients with Thrombotic Thrombocytopenic Purpura (TTP). DHSSPS
15. Health Service Letter HSS (MD) 45/2012 Cytomegalovirus Tested Blood Components. DHSSPS.