# Blood Transfusion Manual

## Reference Number:

**NHSCT/10/298**

## Target audience:

All Nurses including Hospital Diversion Nursing Team, Doctors, Porters, Phlebotomists and Blood Bank Laboratory Staff

## Sources of advice in relation to this document:

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## Replaces (if appropriate):

Legacy United Hospital and Causeway Hospital Blood Transfusion Policy

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## Approved by:

Policy, Standards and Guidelines Committee

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## NHSCT Mission Statement

To provide for all the quality of services we would expect for our families and ourselves
Northern Health & Social Care Trust
Blood Transfusion Manual
(Policy, Procedures and Guidelines)

Policy Title: Blood Transfusion Manual

Review date: This policy will be reviewed every two years.

Lead Author: Aine McCartney – Haemovigilance Practitioner
(On behalf of the NHSCT Transfusion Committee)

EQUALITY AND HUMAN RIGHTS STATEMENT: NHSCT Trust's equality and human rights statutory obligations have been considered during the development of this policy.
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1. Introduction
This manual has been benchmarked against the Northern Ireland Regional Blood Transfusion policy (NIRBTP). Procedures for all the transfusion tasks in the Trust are detailed as are many Regional, National and European guidelines in relation to the administration of blood and blood components which are combined in this document in an effort to utilise best available evidence to ensure good clinical practice.

2. Transfusion Manual Aims
   - To reduce the risks associated with blood transfusions
   - To provide a framework of the mandatory requirements of the NHSCT to ensure best practice in transfusion
   - To provide Trust guidelines in the use of Blood Components and Products sourced from current regional and national guidelines

3. Transfusion Policy
All staff involved in the transfusion process in the NHSCT must be trained and deemed competent in the relevant tasks. Right Patient Right Blood competencies are valid in England, Wales & Northern Ireland for 3 years. The Trust Protocol – Monitoring Compliance with the Requirements of NPSA Safer Practice Notice (14) - Right Patient Right Blood (NHSCT /09) – must be complied with.

The Trust has adopted a “No wristband, No transfusion” standpoint and this must be adhered to at all times.

4. The decision to Transfuse, Patient Information and Consent
The assessment of the patient needs for transfusion of blood components are dependant upon the hospital criteria along with clinical assessment and recent laboratory results. When a decision has been made to transfuse, the reason for transfusion needs to be documented in the patients' notes by the medical staff.

Patient Information
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 receives adequate information regarding the transfusion; the medical staff must inform the patient of the indications for transfusion, the risks and benefits, the alternatives, their right to refuse and the consequences of transfusion e.g. exclusion from donating blood. This information can be given to the patient in the form of an NHS leaflet ‘Receiving a Blood Transfusion.

For patients who are not willing to consent to transfusion, such as Jehovah’s Witnesses, refer to the NHSCT policy “Guidance and Advance Directive for patients who decline blood and blood products”. The beliefs of Jehovah’s Witnesses and any other patients resistant to transfusion should be acknowledged and respected.
In the event of a patient being transfused urgently without advance consultation, the Trust must ensure that the patient is informed of the transfusion and the consequences before discharge. Consent issues should not delay necessary transfusion in an emergency situation.

**THIS INFORMATION EXCHANGE MUST BE DOCUMENTED IN THE PATIENT NOTES ALONG WITH THE REASON FOR TRANSFUSION.**

5. Transfusion Prescription

Prescribing of blood components is the responsibility of the medical officer. As BSQR (2005), *Statutory Instrument 2005/50* excludes blood components from the legal definition of medicinal product, therefore the more correct term is written authorisation of blood component as opposed to prescription. It is noted blood components are not listed in the British National Formulary.

The prescription must specify the patient’s first name, last name and date of birth and unique patient identification number, the blood component/s to be transfused, date and time of transfusion, volume and number of units to be transfused, any special requirements and any special instructions e.g. use of a blood warming device etc. The prescription sheet should be checked prior to organising receipt of a unit and the transfusion should not proceed if the unit has not been prescribed or signed.

5.1. Appropriateness of Transfusion

‘Transfusion of a blood component should be considered only where there is no alternative and the anaemia is life threatening’, NIRTC

**Investigate and treat the cause not the symptoms of anaemia:** anaemia should be investigated and subsequently appropriately treated.

**Transfusion triggers / Haemoglobin threshold:** agreed Trust criteria to be used as guidelines, with clinical assessment when there is no alternative to transfusion.

**Pre-operative care:** optimisation of FBC and clotting factor levels, timely withdrawal of warfarin and aspirin, minimising the amount of blood taken for lab samples.
5.2. Management of a Patient with Known Antibodies

When antibodies are detected by the laboratory, a report is issued reporting the presence and the name of the antibody. Subsequent blood transfusion reports will also contain this information. *It is imperative that this information is clearly indicated in the patient notes.*

The alarm system in the patient notes is used to highlight the antibody status. A red warning is stamped on the first report containing the detected antibody information indicating that the purple triangle alarm system is used. A purple triangle is attached to the warning area on the front of the patient notes with the relevant information added to the inside cover under the ‘Drug/Anaesthetic/Allergic/Blood Product reactions’ section or the ‘Bleeding’ section of the alarm notification. The name of the antibody and the date detected should be included. *This information must be included in Anaesthetic notes and patient transfer notes.*

In patients who have antibodies detected in their blood, extra testing of donor units will have to be done to ensure the donor blood does not contain the antigen to which the patient has an antibody. Antibodies can be formed as a result of previous transfusions or pregnancies, the most common being formed to the Kell, Duffy and Rhesus systems.

When blood is required for these patients two 6ml samples of blood in EDTA tubes are necessary as one sample may need to be sent to the Northern Ireland Blood Transfusion Service (NIBTS) in Belfast for additional antibody confirmation or cross-matching. This may result in a significant delay in getting fully crossmatched blood for these patients; medical staff are advised to send a request and samples 48 hrs before the transfusion is required.

5.3. Patients requiring Irradiated Products

It is essential that sufficient details are included on the request form to indicate the need for the irradiated products. These details should also be on the prescription form so that product specification is included in the pre-administration check.

Irradiated red blood cells have been treated to remove the T-lymphocytes which could lead to the development of Transfusion Associated Graft Vs Host Disease (TA-GvHD) in immunocompromised patients. Patients who require irradiated products are

- on Fludarabine, Cladribine and other purine analogues with Hodgkins Disease (either presently or with history of)
- post bone marrow or stem cell transplant patients
- with suspected or diagnosed congenital immunodeficiency
- awaiting stem cell collection
- in need of an Intrauterine transfusion (IUT)
- in need of top up transfusions following IUT
- in need of a neonatal exchange transfusion
- to receive blood donated from relatives
- to receive HLA selected products

Children under 1 yr do not routinely require irradiated products
5.4. Patients requiring CMV Negative blood

It is essential that sufficient details are included on the request form to indicate the need for the CMV negative products. These details should also be on the prescription form so that product specification is included in the pre-administration check.

The standard leucodepletion process in red cell processing results in a significant reduction in the risk of CMV depletion but there is no guarantee that an individual product has been sufficiently depleted as there are only random unit checks for leucocyte depletion. CMV-free products are indicated for:
- Foetus and infants weighing under 1.5 Kg
- Blood transfused in the first year of life
- IUT
- Top up transfusions post IUT
- Neonatal exchange transfusions
- Immunodeficient patients
- Stem cell transplant recipients (pre and post transplant)

5.5. Assessment of patients at risk of Transfusion Associated Circulatory overload (TACO)

Patients at risk of developing TACO include those over 65 years, less than 1 year, Cardiac patients, those with circulatory problems and those on a fluid balance protocol.

Pre-transfusion baselines should include chest & heart sounds and a physical examination.

Consider no more than one unit in each 24 hour period, if possible, with anti-diuretic cover and a slow rate of transfusion.
6. NHSCT Procedures

6.1. Obtaining a sample for pre-transfusion testing

*Only staff assessed and deemed competent in this task can take a sample for transfusion (Competency 1).*

**Procedure:**

- Ensure that the *Transfusion request form* contains
  - patient’s ID: first and last names, date of birth, identification number, gender
  - location of patient at time of request
  - Consultant in charge of patient

If the patient requires blood components ensure the form contains

- where blood must be sent
- number and type of blood or blood components including any special requirements e.g. gamma irradiated
- information about transfusion history and obstetric history.
- patient’s diagnosis.
- Indications for red cell transfusion
- Recent Hb result and date of this result
- The name of the person requesting the component and their professional identification number

- Bring completed form and venepuncture equipment with you to the patient’s side. Only one patient should be bled at a time by one staff member in a continuous uninterrupted act.

- If the patient is conscious, ask the patient to state their name and date of birth.

- Check these details and patients identification details against the patient’s wristband and the request form.
  - If the patient is unconscious, ensure all wristband details completely match the request form details

- Take sample using a 6ml EDTA tube

- **Handwrite the sample details** using patient’s identification details from the checked wristband

- Sample must include the following legible information
  - patient’s ID: first and last names, date of birth & identification number
  - location of patient at time of request
  - Signature of the person who took the blood
  - date and time of sampling

- Make a final check that the details on the wristband correspond exactly with the details on the sample and request form

- Sign the request form that you took the sample and print your name

- Record in the patient notes why, when and who took the sample

- Send the sample with routine lab collection unless it is an urgent sample which requires immediate dispatch to the lab in which case the lab must be phoned.

*The use of addressograph labels on sample tubes and pre-labelling of sample tubes are not permitted.*
Notes:
- Addressograph labels can be used on the form
- **Samples details must be handwritten at the bedside using the wristband details.**
- Community / Day patients need to have a photographic ID alternative if no wristband is worn.
- In outpatients / pre-assessment clinics patients must have a hospital appointment letter to confirm the correct patient details (name, DoB, hospital number and address)
- All A&E patients who need sampling for transfusion and all in-patients **MUST** have a wristband
- If an unidentified unconscious patient presents to A&E a unique hospital number is issued to the patient and this number along with the sex and approximate age are used as the minimum identifiers. The blood bank must be informed of identification details when they become available
- For routine samples leave the sample and request form at the designated sample collection point. If using a pneumatic tube system for delivery of samples staff should ensure that they have been correctly trained to use the system and there is an appropriate delivery protocol for emergency samples. For emergency/urgent samples the hospital transfusion laboratory staff should be contacted to alert them to the emergency. If a member of staff is requested to take the urgent sample to the laboratory, ensure that they are aware of the urgency of the situation, and where/who in the transfusion laboratory they should deliver it to, according to local Trust policy/guidelines. (If the transfusion laboratory staff are aware there is an urgent sample in transit, they can make further enquiries if it is not received.) Laboratory BMS staff may question the appropriateness of the request if the reasons for requesting blood components are not present, clear or valid in routine requests. Referral to the Consultant Haematologist may be necessary.

The blood bank request form and the sample **MUST** be signed or the sample will be refused by the laboratory

If the blood bank request form or sample is not completed, the sample will be refused by the laboratory.

If there are any discrepancies between details on the sample and form the sample will be refused by the laboratory.

If the details on the sample & form do not match historical details on PAS the sample will be refused by the laboratory.
6.2. Organising receipt of blood component into the clinical area

Only staff assessed and deemed competent in this task can Organise Receipt of a unit (Competency 2).

6.2.1. in Antrim Hospital

- Ensure patient is ready for the transfusion: There is patent access, the patient has been informed, has a wristband and the blood component has been prescribed.
- Positively identify the patient and confirm details on the patient’s identification wristband correspond
- Check the patient details that are used to organise the unit receipt match the patients verbal and wristband details.
- Phone Blood Bank with the Patients:
  - Full Name
  - Date of Birth
  - Unique Identifier number
  - Location of Transfusion
  - The Callers:
    - Name and staff group
- Phone Porter with Patients name, location of transfusion and degree of urgency.
- When porter arrives in clinical area with blood, check patient is present at that location and detail time on ‘Received on ______ward’ section of the pink Component Traceability slip that is with the unit.
- Commence procedure for immediate transfusion

6.2.2. in Causeway Hospital from the Blood Bank laboratory

- Ensure patient is ready for the transfusion: There is patent access, the patient has been informed, has a wristband and the blood component has been prescribed.
- Check the patient details on Product Request form match the patients verbal and wristband details.
- Send completed Product Request form to Blood Bank via SBATS, this form must contain:
  - Patients:
    - Full Name
    - Date of Birth
    - Unique Identifier number
    - Location of Transfusion
  - Callers:
    - Name and staff group
- Phone Blood Bank to confirm dispatch of Product Request form.
- When Blood Bank phone to inform Unit has been sent via SBATS, collect unit from SBATs station immediately. If unit does not arrive within 5 minutes, inform Blood Bank. When the component is collected from the SBATs station detail the time on ‘Received on ______ward’ section of the pink Component Traceability Slip that is with the unit.
- If SBATS is not working the ward phones the porter to collect the Product Request Form from the ward, deliver to blood bank and return to the ward with units. When porter arrives in clinical area with blood, check patient is present at that location and detail time on ‘Received on ______ward’ section of the pink Component Traceability slip that is with the unit.
6.2.3. in Mid-Ulster Hospital

- Ensure patient is ready for the transfusion: There is patent access, the patient has been informed, has a wristband and the blood component has been prescribed.
- Check the patient details that are used to organise the unit receipt match the patients verbal and wristband details.
- Phone Porters with the Patients:
  - Full Name
  - Date of Birth
  - Unique Identifier number
  - Location of Transfusion
- Callers: Name and staff group

Porter selects a unit that matches all the above patient details and signs 
‘Blood removed from’ section of pink Component Traceability Slip and fridge 
log (C10) form at corresponding section
- When porter arrives in clinical area with blood, check patient is present at that location and detail time on ‘Received on ______ ward’ section of the pink Component Traceability slip that is with the unit.
- Commence procedure for immediate transfusion

6.2.4. in Whiteabbey Hospital

- Ensure patient is ready for the transfusion: There is patent access, the patient has been informed, has a wristband and the blood component has been prescribed.
- Check the patient details that are used to organise the unit receipt match the patients verbal and wristband details.
- Phone porter to go to Blood Fridge
- Porter phones ward when at the fridge and details written down by porter
  - Patients: Full Name
    - Date of Birth
    - Unique Identifier number
    - Location of Transfusion
  - Callers: Name and staff group
- Porter selects unit that match all the above patient details and porter
- signs ‘Blood removed from ’ section of pink Component Traceability Slip and fridge log (C10) form at corresponding section
- When porter arrives in clinical area with blood, check patient is present at that location and detail time on ‘Received on ______ ward’ section of the pink Component Traceability Slip that is with the unit.
- Commence procedure for immediate transfusion
6.2.5. in Braid Valley / Robinson / Dalriada / Moyle Hospitals

- Check the patient details that are used to organise receipt of the component match the patients verbal and wristband details.
- Phone Blood Bank with the Patients': Full Name, Date of Birth, Unique Identifier number, Location of Transfusion
- Callers': Name and staff group
- For non-urgent transfusions, arrange transport of unit by routine lab van delivery. If not possible to wait until next routine delivery arrange taxi collection and delivery of unit.
- On receipt of unit, detail time on ‘Received on ______ ward’ section of the pink Component Traceability Slip that is with the unit
- Before removal from cold box, ensure patient is ready for the transfusion: there is patent access, the patient has been informed, has a wristband and the blood component has been prescribed.
- Commence procedure for immediate transfusion

6.2.6. for Home Transfusion from Antrim

- Bring checked patient details to fridge (i.e., details that were used in labelling the sample) Patients': Full Name, Date of Birth, Unique Identifier number
- If one of the units has the compatibility form attached, select this one first.
- Check patient details on unit that match all collection details.
- Detail the time in the ‘Dispatched from Blood Bank’ section of the pink Component Traceability Slip and sign and time the relevant fridge log file (labelled HDNT or HCH) at the corresponding section
- Pack the unit(s) into validated cool box with cool packs
- On arrival to patient’s location commence procedure for immediate transfusion. (see section 6.5)

6.2.7. for Home Transfusion from Causeway

- Bring checked patient details to Blood Bank (i.e., details that were used in labelling of sample) Patients': Full Name, Date of Birth, Unique Identifier number
- BMS in Blood Bank will select the required unit(s) and check patient details on unit(s) match all collection details.
- The BMS will detail the time in the ‘Dispatched from Blood Bank’ section of the pink Component Traceability Slip
- Pack the unit(s) into validated cool box with cool packs
- On arrival to patient’s location commence procedure for immediate transfusion. (see section 6.5)
6.3. Selecting a Blood Unit from a Designated Blood Fridge
Applies to Blood Bank Laboratory staff Antrim and Causeway, Medical and Nursing staff in Causeway ICU and portering staff in MidUlster and Whiteabbey Hospitals

Only staff assessed and deemed competent in this task can select a named unit from a designated blood fridge. (Competency 3)

- Bring the following details to the designated Blood Fridge
- Patients: Full Name
  Date of Birth
  Unique Identifier number
  Location of Transfusion
  along with the name of staff member who organised collection and the location of the transfusion
- Match all three patient details with the patient details on the unit, selecting the unit that has the compatibility form attached if this is the first unit from the request.
- Time and date the relevant part of the pink Component Traceability Slip.
- Document the removal of the blood component from the fridge with signature.
- Put unit into white blood transport bag if applicable
- Deliver unit immediately to the clinical area
- Hand the unit over to a member of clinical staff, ensuring they document the time of receipt in the presence of the porter if relevant
6.4. Preparing and administering a Blood Component for Transfusion

*Only staff assessed and deemed competent in this task can perform a pre-administration check and/or administer a unit for transfusion.*

(Competency 4)

From Lab: Blood Component with attached Compatibility label / Component Traceability slip / compatibility report

Documentation: Prescription document / observation sheet / patients notes

Checks should be at the patient’s (bed)side and should involve two staff members who perform these checks independently.

It is acceptable for one trained and assessed member of staff to undertake the pre-administration patient identification checks in out of hospital transfusions.

The staff member erecting the transfusion should be one of the two staff members performing the pre-administration checks.

**Unit / Lab documentation check**
- Check patient details (Full name/ Date of Birth / Identity number) are **identical** on the three lab items.
- Check the donor number on the unit (at top of bar code) is the same as that on the Compatibility Label, on the pink Component Traceability Slip and on the compatibility report.
- Check the group on the unit matches the unit group on all three documents.
- Check the patients blood group is same in three documents.
- Check the expiry date on the unit is in date (midnight on the date shown).
- Check there is no damage, clumping, discoloration of unit and temp feels OK (RBC – fridge temp, platelets RT, FFP between fridge and RT).
- Check all patient details on prescription document and observation chart match the patient details on the unit.
- Check if there are any special requirements on prescription and check these are met (CMV neg, Irradiated, neg for any patient antibodies, diuretic etc).

**Patient identity check**
- Ask the patient, if conscious, to state their full name and date of birth.
- Check these details and the patient identifiers on the blood component match all the details on the patients wristband.

*NB: No wristband = No Transfusion: Patient details on component must absolutely match the details on the wristband. If not: DO NOT PROCEED*

- If all checks are correct, sign the compatibility report form and the prescription sheet; ensure a second member of staff does a separate check and also signs compatibility report form.
- Carry out and record baseline observations on patient (P, BP, Temp, Resp); include chest & heart sounds for patients at risk of TACO.
- Check venous access and that patient is happy to proceed.
- Inform patient to tell staff if feel any unusual effects or unwell.
- Use a administration set for blood components (one with a filter).
- Once transfusion starts, record the start time on the prescription sheet, print name and job title on the pink Component Traceability Slip and return to lab.
- Do and record second set of Obs at 15 mins.
- When transfusion over, carry out and record final set of Obs, detail stop time in prescription document and ensure safe disposal of equipment.(see 9.4)
6.5. Traceability and Cold Chain Path of Blood Components

100% of donor units receipted into any Blood Bank in the European Union must be traced to its recipient: Blood Safety and Quality Regulations: Statutory Instrument 2005/50

- The pink Component Traceability Slip maintains the path of the unit and must be timed and dated when:
  o The unit leaves the required storage
  o The unit arrives in the clinical area
  o The transfusion of the unit commences

- The pink Component Traceability Slip must be returned to the Blood Bank Laboratory as soon as possible where the transfusion record is maintained for 30 years. This form traces the donor number to the patient and when signed is taken as absolute proof that this transfusion did occur

- **30 MIN RULE**: If red cells need to be returned to the blood bank fridge, this must be within 30 mins of the time the unit was removed from the fridge. If the unit is returned more than 30 mins after removal it will be wasted at a cost of approx £110 per unit.

Note: If the transfusion has not commenced within 30 minutes of removal from validated cold storage - the transfusion can proceed provided the stop time is within 4 hours.

- **Community Transfusions** (see sections 6.2.6 & 6.2.7)
  o Units taken from blood bank storage should be packed in a validated transport box with cool packs, if appropriate. Storage temperature is validated for a total of 4 hours from the time of packing.

  o For 2 unit transfusions
    - When the first unit is removed from the cool box, ensure that the remaining unit is repacked with the cool packs, the insulated lid is replaced and the box closed.
    - Transfusion of the second unit must commence within 4 hours of the box being packed.
7. NHSCT Guidelines for Adult Patients
7.1. Guidelines for the use of Red Blood Cells

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<th>Consider Transfusion when Hb is below</th>
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<td>7g/dl</td>
<td>8.5 - 9 g/dl</td>
</tr>
<tr>
<td>&gt;65 yrs no cardiovascular / cerebrovascular problems</td>
<td>8g/dl</td>
<td>9.5 - 10 g/dl</td>
</tr>
<tr>
<td>Cardiovascular / Cerebrovascular History</td>
<td>9g/dl</td>
<td>10.5 - 11 g/dl</td>
</tr>
<tr>
<td>Appropriately symptomatic¹</td>
<td>10g/dl</td>
<td>11.5 - 12 g/dl</td>
</tr>
<tr>
<td>Evidence of ongoing bleeding² (If relevant see Trust Policy ‘Management of Massive Obstetrics Haemorrhage’)</td>
<td>10g/dl</td>
<td>11.5 - 12 g/dl</td>
</tr>
<tr>
<td>Current marrow failure or chemotherapy/radiotherapy</td>
<td>10g/dl</td>
<td>11.5 - 12 g/dl</td>
</tr>
</tbody>
</table>

1. Appropriately symptomatic: Symptoms such as dyspnoea, angina palpitations, tachycardia, orthostatic hypotension and syncope that is documented and likely to be due to anaemia (Tiredness alone is not an appropriate symptom for transfusion)

2. Ongoing bleeding causing symptoms as listed in 2. or bleeding > 500ml/hr and not stopping

   - Generally allow increase of Hb result by 1.2 – 1.5 g/dl per unit of red cells
   - 24 hr post transfusion check recommended in routine situations prior to subsequent transfusions
   - **Above upper limit is classed as over transfusion**
### 7.2. Guidelines for Ordering Blood for Routine Procedures

<table>
<thead>
<tr>
<th>Proposed Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL SURGERY</strong></td>
</tr>
<tr>
<td>Pyloroplasty / Vagotomy</td>
</tr>
<tr>
<td>Gastrectomy</td>
</tr>
<tr>
<td>Hemicolecetomy</td>
</tr>
<tr>
<td>Anterior Resection</td>
</tr>
<tr>
<td>Abdomino Perineal Resection</td>
</tr>
<tr>
<td>Haemorrhoidectomy</td>
</tr>
<tr>
<td>Hernia (inguinal, femoral, umbilical or incisional)</td>
</tr>
<tr>
<td>Cholescyctectomy</td>
</tr>
<tr>
<td>Laparotomy</td>
</tr>
<tr>
<td>Mastectomy</td>
</tr>
<tr>
<td>Liver Biopsy</td>
</tr>
<tr>
<td>Varicose Veins</td>
</tr>
<tr>
<td><strong>GENITOURINARY</strong></td>
</tr>
<tr>
<td>Prostatectomy</td>
</tr>
<tr>
<td>TURP/TURB</td>
</tr>
<tr>
<td>Nephrectomy</td>
</tr>
<tr>
<td>Renal Biopsy (open, needle)</td>
</tr>
<tr>
<td>PCNL</td>
</tr>
<tr>
<td><strong>GYNAE</strong></td>
</tr>
<tr>
<td>Ovarian / Cystectomy Laparoscopic</td>
</tr>
<tr>
<td>Ovarian / Cystectomy Open</td>
</tr>
<tr>
<td>Myomectomy</td>
</tr>
<tr>
<td>Hysterectomy (abdominal / vaginal)</td>
</tr>
<tr>
<td>Pelvic Clearance</td>
</tr>
<tr>
<td>Laparoscopy</td>
</tr>
<tr>
<td><strong>OBSTETRICS</strong></td>
</tr>
<tr>
<td>Elective Section</td>
</tr>
<tr>
<td>Emergency Section</td>
</tr>
<tr>
<td>Placenta abrupta</td>
</tr>
<tr>
<td>Placenta previa</td>
</tr>
<tr>
<td>History of PPH</td>
</tr>
<tr>
<td><strong>ORTHOPAEDIC</strong></td>
</tr>
<tr>
<td>Limb amputation</td>
</tr>
</tbody>
</table>

- Please note these are Guidelines to be used with clinical assessment of the patient e.g., exceptions likely in cases of Pre-Op Anaemia, patient with known antibodies, patients more likely to bleed.
- The reason for ordering components must be recorded in the patient’s notes.
7.3. Use of Fresh Frozen Plasma

**Appropriate use of FFP:**
- Correction of 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

*Coagulopathy - Prothrombin Time (PT) and Activated Partial Thromboplastin Time (APTT) are prolonged by 1.5x normal or more.*

- Massive transfusion, *(see pages 23/24)*

**Dose:** 12-15 ml/kg body weight to provide 30% of normal coagulation factor activity. *1 unit of FFP contains 300ml: on average 4 units would provide one therapeutic dose for a 70kg adult*

**Inappropriate Use of FFP**
- Reversal of warfarin induced coagulopathy in the absence of bleeding or when Prothrombin Concentrate Complex is available (See notes below for warfarin reversal)
- Correction of coagulopathy in the absence of bleeding or anticipated peri-operative blood loss
- Volume or plasma expansion in adults
- Routine volume expansion in preterm infants

**Notes:**
- **Warfarin Reversal:** First line treatment for the reversal of warfarin induced life-threatening bleeding is Prothrombin Complex Concentrate (PCC) – see page 31
  - If PCC is not available or is contraindicated give FFP 10-15 ml/kg + intravenous Vitamin K
  - If non-life threatening, warfarin reversal should be done by administration of Vitamin K, not FFP

- **Children under the age of 16** are to be prescribed MB FFP. This is plasma which has been subjected to virus photoinactivation in the presence of methylene blue.
7.4. Use of Platelets

**Bone Marrow Failure**
- To prevent spontaneous bleeding when the platelet count <10 x 10^9/l
- To prevent spontaneous bleeding when the platelet count <20 x 10^9/l in the presence of additional risk factors for bleeding such as sepsis or haemostatic abnormalities
- To prevent bleeding associated with invasive procedures. The platelet count should be raised to >50 x 10^9/l before lumbar puncture, epidural anaesthesia, insertion of intravascular lines, transbronchial and liver biopsy, and laparotomy, and to >100 x 10^9/l before surgery in critical sites such as the brain or the eyes

**Critical Care/Surgery**
- Massive Blood Transfusion. The platelet count can be anticipated to be < 50 x 10^9/l after 1.5 – 2 x blood volume replacement. Aim to maintain platelet count >50 x 10^9/l. In multiple trauma or CNS injury, the platelet count should be maintained above 100.
- Bleeding, not surgically correctable and associated acquired platelet dysfunction e.g. post-cardiopulmonary bypass, possibly combined with the use of potent anti-platelet agents such as clopidigrel
- Acute disseminated intravascular coagulation (DIC) in the presence of bleeding and severe thrombocytopenia
- Inherited platelet dysfunction e.g. Glanzmann's thrombasthenia with bleeding or as prophylaxis before surgery

**Immune thrombocytopenia**
- Autoimmune thrombocytopenia, in the presence of major haemorrhage.
- Post-transfusion purpura, in the presence of major haemorrhage
- Neonatal alloimmune thrombocytopenia, to treat bleeding or as prophylaxis. The only effective management is HPA 1a/5b negative platelets which need to be especially ordered from NIBTS. Random platelets are advised only as a holding measure in a very thrombocytopenic baby while this is being organised. The platelet thresholds are >30 in a stable baby or >50 in a bleeding / unstable baby.

*Dose: Transfusion of one standard dose/pool of platelets is expected to result in an increment of 20-30 x 10^9/L in the peripheral count if the patient is not refractory*
7.5. Use of Cryoprecipitate

- Acute disseminated intravascular coagulation (DIC), where there is bleeding and a fibrinogen level < 1g/l
- Advanced liver disease, to correct bleeding or as prophylaxis before surgery, when fibrinogen level < 1g/l
- Bleeding associated with thrombolytic therapy causing hypofibrinogenaemia
- Hypofibrinogenaemia (fibrinogen level < 1g/l) secondary to massive transfusion
- Renal failure or liver failure associated with abnormal bleeding where DDAVP is contraindicated or ineffective

(Dose – 2mls/kg body weight equivalent to 2 pooled packs for an adult)
8. NHSCT Guidelines for Neonates and Paediatric Patients

Cellular components for neonates should be CMV negative.

Ensure if special requirements are being ordered that this is detailed in the Blood Request form and also in the prescription, e.g. paedipacks, CMV neg, Irradiated or Antibody negative blood

Limiting Donor Exposure
Small volume transfusions are usually given to replace phlebotomy losses. If more than one red cell transfusion event is anticipated in a paediatric/neonate patient, the Blood Bank should be informed so that maximum efforts are made to sequester dedicated aliquots, (paedipacks), from a single donation thus limiting donor exposure. Communication with the Blood Bank in continuation or desisting in transfusion plans ensures best use of suitable blood and minimal donor exposure.

8.1. Red Cells
Surrogate markers for anaemia include respiratory irregularity, tachycardia, poor weight gain, lethargy, poor suck and increased lactate levels. All of these are susceptible to influence from confounding factors. Patients with a higher oxygen extraction ratio (>40%), a measure of adequacy of oxygen delivery, seem more likely to benefit from transfusion. Similar benefits may be obtained simply by volume expansion, implying that some of these markers may reflect a hypovolaemic state.

Anaemia of prematurity: Top up transfusions restore or maintain adequate $O_2$ delivery

$O_2$ dependency: Neonates with moderate to severe pulmonary disease are thought to benefit from a higher Hb or Haematocrit (0.40), which allows $O_2$ delivery to be optimised in the presence of underlying respiratory insufficiency.

Top up transfusion:
- Dose: 10 - 20 ml/kg
- Rate: 5 ml/kg/hr

Guidelines for Transfusion of Red Blood Cells

<table>
<thead>
<tr>
<th>Patient Criteria</th>
<th>Hb Transfusion Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaemia in first 24 hrs</td>
<td>12 g/dl</td>
</tr>
<tr>
<td>Cumulative blood loss in 1 week, neonate in intensive care</td>
<td>10% blood volume</td>
</tr>
<tr>
<td>Neonate in Intensive Care</td>
<td>12 g/dl</td>
</tr>
<tr>
<td>Acute blood loss</td>
<td>10% blood volume</td>
</tr>
<tr>
<td>Chronic $O_2$ dependency</td>
<td>11 g/dl</td>
</tr>
<tr>
<td>Late anaemia, stable anaemia</td>
<td>7 g/dl</td>
</tr>
</tbody>
</table>
8.2. Fresh Frozen Plasma  
The clotting times of normal infant blood may be longer than those of adults and those of premature infants may be even longer, even in the absence of further pathology.

**Use FFP in:**
- Neonates with a significant coagulopathy (e.g. PT or APPT ratio >1.5) and significant risk of bleeding or who are about to undergo an invasive procedure.
- DIC
- Vitamin-K dependant Bleeding
- Inherited deficiencies of coagulation factors

| Dose: 10 -20 ml/ kg |
| Rate: 10-20 ml/kg/hr |

Correction of the prolonged coagulation screen is unpredictable and this should therefore be rechecked following administration.

UK Department of Health requires that children under 16 yrs of age requiring FFP should receive pathogen reduced FFP of Non-UK origin.

**Do not use FFP in:**
- Simple volume expansion (not superior to crystalloids or colloids in the treatment of neonatal hypotension)
- Treating polycythaemia unless there is a co-existing coagulopathy.
- Treating septic patients in attempt to improve immune function.

8.3. Platelets

**Guidelines for Administration of platelets**

<table>
<thead>
<tr>
<th>Patient Criteria</th>
<th>Platelet Transfusion thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm or term neonate, with bleeding</td>
<td>$50 \times 10^9$/l</td>
</tr>
<tr>
<td>Sick preterm or term infant , no bleeding</td>
<td>$30 \times 10^9$/l</td>
</tr>
<tr>
<td>Stable preterm or term infant, no bleeding</td>
<td>$20 \times 10^9$/l</td>
</tr>
</tbody>
</table>

See page 18 for management of platelets in Neonatal alloimmune thrombocytopenia.

**Volume of platelets concentrates to be transfused**
- Children weighing < 15 Kg: 10-20 ml/kg
- Children weighing > 15 Kg: Single aphaeresis Unit

Rate: 10-20 mls/kg/hr
8.4. Neonatal Exchange Transfusion

Exchange transfusion (ET) may be used to manage severe anaemia at birth, particularly in the presence of heart failure, and to treat severe hyperbilirubinaemia, usually caused by HDN.

Controversial indications such as metabolic disease, septicaemia and disseminated intravascular coagulation (DIC) have not been subjected to adequate clinical evaluation.

A ‘single-volume exchange’ will remove 75% of red cells, while a double-volume exchange (160-200 ml/kg, depending on gestation) removes 90% of the initial red cells. A double-volume exchange can remove 50% of available intravascular bilirubin.

Requests for ET should be directed to the local blood bank laboratory as early as possible; as the units are prepared by the NIBTS in Belfast there will be a delay in the delivery of the component.
9. Massive Transfusion Protocol

**ACTIVATION**

- Blood loss requiring urgent transfusion, where the bleeding has not yet been stopped.
- The protocol can be implemented by a midwife or nurse, junior or senior medical staff on behalf of the doctor in charge of the situation.
- Blood Bank must be informed IMMEDIATELY and clearly that the protocol is being called.
- Porters must be informed IMMEDIATELY and clearly that the protocol is being called (not necessary in Causeway if SBATS working)
- The porters will immediately go to blood bank unless informed otherwise

**CONTACTING BLOOD BANK**

Antrim  
Mon – Fri  9.00 am – 5.00 pm  Ext. 3044 / 4145  
Out of Hours  Bleep 8- 5139

Causeway  24 hrs:  Ext 5733

If possible a designated person will be responsible for any necessary lab contact

**PATIENT PREVIOUSLY GROUPED AND SCREENED (LAST 7 DAYS)**

**SAMPLE AVAILABLE IN BLOOD BANK**

- 10 Units group specific blood issued in two batches of five units
- Un-crossmatched blood should be available in 10 minutes.
- Crossmatched blood will take 30 minutes.
  (STATE WHICH TIME SCALE IS APPROPRIATE)
- Platelets – available1 hour (1.5 hrs if Causeway) after implementation of protocol – must be requested
- FFP – 4 units issued automatically 20 minutes after implementation.
- Further supplies of group specific un-crossmatched blood, FFP and platelets will be issued in consultation with the person activating the protocol.

**NO PATIENT SAMPLE AVAILABLE IN BLOOD BANK**  
(NB: Transfusion sample must be taken before any transfusion.)

- O Rh D Negative for female patients, O Rh D Positive for male until group & hold received in blood bank
- Sample and form must conform to lab zero tolerance request procedures
- Unidentified unconscious patients must have Hospital number, gender and approximate age details on sample and form
- On receipt of sample 10 units of group specific blood will be issued (as above)
- Un-crossmatched blood – 10 minutes.
- Crossmatched blood – 30 minutes.
- Platelets – available 1 hour after implementation of protocol- must be requested
- FFP – 4 units issued automatically 20 minutes after implementation.
- Further supplies of group specific un-crossmatched blood, FFP and platelets will be issued in consultation with the doctor activating the protocol.
RECOMMENDATION FOR THE USE OF COAGULATION FACTORS
(Ensure samples are taken for Coagulation Screens)

It is now recommended that FFP is used in a massive transfusion as soon as Red Cells are transfused to prevent coagulopathy. 4 units of FFP are automatically prepared by Blood Bank; any other required units must be requested.

When bleeding is controlled the recommendations for use of FFP are:
- FFP: PT>20 sec; APTT>60 sec
- Cryo: Fibrinogen <1g/l.
- Platelets: Platelet count<50x10⁹/l – Actively bleeding.

PERSON ACTIVATING PROTOCOL IS RESPONSIBLE FOR NOTIFYING THE BLOOD BANK AND PORTERS WHEN TO STAND DOWN. THIS PERSON IS ALSO RESPONSIBLE FOR THE RETURN OF ALL UNUSED UNITS TO THE BLOOD BANK.

The activation and implementation of every massive transfusion will be reviewed by Haemovigilance and the effectiveness, appropriateness and outcome fed back to all staff groups concerned – clinical, laboratory and portering.

10. Transfer of Blood with a patient to another Hospital

Only blood components in sealed, validated boxes (which have had details forwarded) can be accepted by the receiving hospital.

Only components anticipated for transit should be moved with the patient.

If blood components are to go with a patient, the Blood Bank must be informed of the transfer; the units will be packaged & sealed and the information faxed to the receiving hospital. Only open the seal and check the units when the blood is to be used.

Storage temperature is validated for 4 hours from the time of packing.

If crossmatched blood required for transit is in the Causeway ICU fridge the units must be sent to Blood Bank to be packaged

DO NOT SEND BLOOD UNITS WITH PATIENT WITHOUT LAB INPUT AS BLOOD WILL DISCARDED ON ARRIVAL.
11. Technical Aspects and timings in Transfusion

11.1 Red Cells

- The time taken to transfuse a unit of red cells should be 2 - 3 hrs. This can be increased to a maximum of 4 hours if it is indicated. A transfusion that is expected to take longer than 4 hours should be discussed with the consultant Haematologist.

- All components should be transfused as soon as possible on receipt in the clinical area. If red cells cannot be commenced within 30 mins, it must be ensured that the transfusion should be completed a maximum of 4.5 hrs after removal from the blood fridge. (30 mins to start and 4 hrs max transfusion time)

- Routine and top-up transfusions should only be done within routine hours.

- Blood for transfusion must only be stored in a designated blood fridge, which is temperature controlled and validated, at a stable temperature 4-6ºC.

- Blood must be transfused through a sterile administration set for blood components designed for the procedure (administration set for blood components with filter).

- Administration set for blood components in use do not need to be primed. They can be flushed with the blood or 10-20mls of Saline to ensure venflon patency. Use enough saline to flush the line at the end of the transfusion to ensure the entire unit is given.

- Components in neonates and infants can also be transfused through a paediatric blood component transfusion set with a screen filter (170 – 200µ). These sets are also designed for use with syringes. It is unnecessary to prime the administration set with saline unless checking patency of line.

- Only electronic infusion pumps that have been verified as safe to use for the administration of red cells may be used according to the manufacturer’s instructions.

- 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 is to be transfused.

- Blood is not routinely warmed. Blood must only be warmed using a specifically designed commercial device with a visible thermometer and audible warning. Blood should be warmed:
  - During Surgery
  - In massive transfusion
  - Patient has cold agglutinins (this will be on compatibility report)
  - Infant exchange transfusion
  - Hypothermic patient

- Drugs must not be added to blood under any circumstance.

- Glucose solutions must never be administered immediately before or after a unit of blood is given as this may cause formation of aggregates.
A new administration set for blood components must be used:
- After 12 hours of continuous transfusion in order to prevent bacterial growth.
- If another infusion is to continue after the transfusion.
- To transfuse platelets after red cells

11.2 FFP
- FFP must be transfused through a sterile administration set for blood components which has been primed with saline.
- Start infusion immediately upon arrival to the ward area.
- Infusion should be completed within four hours of FFP being thawed and the infusion should take no longer than 60 minutes.
- If the FFP looks clumped or if the pack looks damaged, consider bacterial contamination and check with the laboratory whether to proceed with the transfusion.

11.3 Platelets
- Platelets must never be stored in a refrigerator.
- When transfusing platelets, a administration set for blood components may be used, provided it has not previously been used for the administration of blood.
- Platelets must be administered immediately upon arrival to the ward area. Return to Blood Bank if there is any delay.
- Infuse platelets over not more than 30 minutes.
- If platelets look clumped or if the pack looks damaged, consider bacterial contamination and check with the laboratory whether to proceed with the transfusion.
- Platelets are ordered on a named patient basis from the NIBTS in Belfast and transport time must be considered.
11.4 Completing the transfusion

- Empty blood bags must be spigotted and stored, at room temperature, in a used unit bag for 48 hours in a designated area; the compatibility label should be kept on the unit during this time. The administration set for blood components should be removed and discarded in to sharps clinical waste as soon as the transfusion event is finished.

- Where a blood component has been partially transfused for reasons other than a suspected transfusion reaction, the unit bag (with remaining contents) should be sealed with a yellow luer slip end and retained for 48 hours as above.

- Ensure that empty blood bags are discarded in a yellow clinical waste container 48 hours after the transfusion after the patient information is removed.

- The blood transfusion compatibility report form must be filed in the patient’s notes.

- Any unused blood units sent as a multiple dispatch must be returned to the blood bank as soon as possible.

- If the transfusion runs over its prescribed time the doctor must be informed. If the doctor decides to proceed over 4 hrs, the reason should be documented and signed by the doctor in the patient notes.

- The end time of the transfusion must be recorded in the prescription details.

- 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 by the doctor and be checked according to the Trust intravenous fluid policy) OR flush the venous access with 5 to 10mls of 0.9% sodium chloride.

12 Documentation of Transfusion

A permanent record of the transfusion and administration of blood components must be kept in the medical notes.

The following items are included:

- an entry in the case notes describing the indication for the use of blood components
- a record that risks and benefits have been explained to patient
- the date, start time and finish time of each unit transfused
- the desired effect / outcome of the transfusion
- the occurrence and management of any adverse effect
- blood transfusion compatibility report form
- “prescription” documents
13 Care and Monitoring of the Transfused Patient

- Registered Nurses and Midwives are responsible for the care and monitoring of patients receiving a transfusion. In addition they are responsible for measuring and documenting the patient’s vital signs throughout the transfusion.

- The doctor and/or the qualified nurse is responsible for informing the patient about possible adverse effects of transfusion and the importance of reporting immediately any adverse effects. Ensure the patient has access to a buzzer. Adverse effects include:
  - Pyrexia.
  - Shivering.
  - Rashes.
  - Flushing.
  - Shortness of breath.
  - Tachycardia.
  - Headache.
  - Chest tightness.
  - Hypotension.
  - Anxiety/restlessness.
  - Pain in the extremities or in the loins.
  - Feeling of impending doom.

- Visual observation of the patient throughout transfusion is an essential assessment particularly during the first 15 minutes.

- Throughout the infusion the minimum observations must be carried out and recorded as follows:
  - Temperature, pulse, blood pressure and respirations at the start, after 15 minutes and at the end of each transfusion episode.
  - If the patient’s clinical condition changes more observations may be required.

- Patients requiring the prescription of diuretic and/or patients at risk of fluid overload must have a history and physical examination, including chest & heart sounds, performed at the time of the decision to transfuse.
13.1 Management and Reporting of Adverse Events

- 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. Complete the “Suspected Transfusion Reaction Form”, appendix 4 page 40.

- If a severe transfusion reaction is suspected:
  - Stop the transfusion immediately and seek urgent medical advice.
  - Change the administration set for blood components and maintain venous access using normal saline, to keep the vein open.
  - Report the reaction immediately to the hospital blood bank.
  - Return the blood remaining in the bag and the administration set to the laboratory for testing. Blood and urine samples from the patient will be requested by the laboratory.
  - Monitor the vital signs, as directed by the medical staff.
  - Record the volume and colour of any urine passed must be recorded.
  - If a severe reaction is suspected, seek medical advice from a haematologist.

- Reporting of adverse events.
  All adverse events and near misses related to blood transfusion must be reported according to:-
  - The patients Consultant
  - Ward manager
  - Blood Bank Laboratory
  - Haemovigilance Practitioner – complete the Haemovigilance Report Form (appendix 3)

An investigation may be carried out by the Haemovigilance Practitioner to see what happened, where in the process it happened, why it happened and how to prevent it happening again. A copy of the Haemovigilance report will be forwarded for discussion at the Hospital Transfusion Committee and to clinical governance (the Haemovigilance Practitioner will complete the Trust Incident and Near Miss Reporting form) where the conclusions, the recommendations and the action needed will be discussed.

Any adverse event or near miss is reported to the Serious Hazards of Transfusion (SHOT) office which has an anonymous reporting system for such events and they issue an annual UK wide report on these events. All serious reactions and clinical Blood Bank incidents are also reported to ‘Serious Adverse Blood Reactions and Events’ (SABRE).
14. Training and assessment of staff

All staff involved in any of the processes of transfusion must receive training at induction and thereafter regularly within their area of responsibility in the transfusion process.

This includes all grades of:
- Medical Staff
- Nursing staff
- Auxiliary Nursing staff
- Phlebotomists/Healthcare assistants
- Portering staff
- Laboratory BMS staff
- Van drivers

Safe Transfusion Face to Face Training is prepared, organised and delivered by the Haemovigilance Practitioners and there is a permanent record kept of the content of each training session and the attendees. An alternative to Face to Face Haemovigilance training on Safe Transfusion is successful completion of the Transfusion E-Learning Programme, level 1 available on the internet at www.learnbloodtransfusion.org.uk

Safe Transfusion Training

Medical Staff – successful completion of level 1 of the transfusion e-learning programme www.learnbloodtransfusion.org.uk. Level 2 of the programme deals with the appropriate use of blood components and is required by NIMDTA for doctors in training.

Nursing and related groups - successful completion of level 1 of the transfusion e-learning programme www.learnbloodtransfusion.org.uk. The alternative is to attend a Safe Transfusion presentation prepared and delivered by the Haemovigilance Practitioner.

Certificates should be printed from the e-learning site and be made available at each competency assessment. For staff attending a safe transfusion presentation will receive a certificate of attendance.
15. Blood Products

(Octaplex, Immunoglobulin, NovoSeven, Albumin)
(Anti-D is also a blood product - guidance for use and administration of Anti –D is available from Obs & Gynae)

A blood product is a medicine derived from some element of Blood. As a result, a blood product does not come as a ‘unit’, and the technical aspects of the Blood Components do not apply to the Blood Products.

Technical Aspects for Blood Products
• If required, a fluid giving set is adequate for infusion of the above. It is not necessary to use a Administration set for blood components with filter.
• The rates of infusion, storage of the component, mode of administration and any necessary re-constitution of the product are to be found in the package insert and may vary from brand to brand and batch to batch.
• Observations for Blood Products are as for any medicine, not as for Blood Components, and are dictated by the medical staff and the patients condition.

15.1 Octaplex (Prothrombin Complex Concentrate)
For Emergency Warfarin Reversal

Guidelines for the rapid reversal of warfarin coagulopathy in patients with life threatening haemorrhage and intracranial haemorrhage

(a) Intracranial bleed
(b) Retroperitoneal bleed
(c) Intra-ocular bleed
(d) Muscle bleed with compartment syndrome
(e) Pericardial
(f) Active bleed with hypotension or 2g fall in Hb

Contact Haematologist immediately

PCC 30 iu/Kg - INR >4
PCC 15 iu/Kg - INR <4
+ Vitamin K 5mg IV

Check INR and APTT post infusion and at 4 hours
If INR > 1.5 discuss with haematology

PCC is relatively contra-indicated in DIC, acute liver failure and thrombosis.

Discuss with Haematologist.

Ref: NI Haemophilia & Thrombosis Centre
15.2 Immunoglobulin (IgG)
Immunoglobulin is licensed for us in the following conditions;

- Primary Immunodeficiency Syndrome
- Congenital agammaglobulinemia and hypogammaglobulinemia
- Common Variable Immunodeficiency
- Severe combined immunodeficiencies
- Wiskott Aldrich Syndrome
- Hypogammaglobulinemia secondary to Myeloma or CLL
- Congenital Aids in children
- ITP (Idiopathic Throbocytopenic Purpura)
- Guillian-Barre Syndrome
- Kawasaki Disease
- Allogeneic bone marrow disease

- All prescriptions for licensed and unlicensed use of immunoglobulins must be forwarded for consultation with a NHSCT Haematologist.
- The patients height and weight must be supplied for each order
- The immunoglobulins are supplied from the NIBTS on a named patient basis

15.3 Novoseven

This is held in the Trust in the Intensive Care Units along with the guidelines for appropriate use. The decision to use this product must have the approval of two Consultant Anaesthetists and every use is audited.

15.4 Albumin

This product is issued on a named patient basis and is used to replace the blood or body fluids lost due to bleeding, surgery or dialysis
16. References


NBS Receiving a Blood Transfusion: Important Patient Information. UK: HPSS

NI Regional Blood Transfusion Policy. Effective 1st June 2009; NI Regional Transfusion Committee (2009)

17. Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;E</td>
<td>Accident &amp; Emergency</td>
</tr>
<tr>
<td>Addressograph</td>
<td>Addressograph label</td>
</tr>
<tr>
<td>Antibodies</td>
<td>Patients may develop red cell antibodies due to previous transfusions or pregnancies. There may be a delay in providing blood for patients with antibodies as additional testing is required in the blood bank.</td>
</tr>
<tr>
<td>Anti-D</td>
<td>Human immunoglobulin preparation containing a high level of antibody to the Rh D antigen</td>
</tr>
<tr>
<td>Apheresis</td>
<td>A process in which whole blood is collected from a donor and separated into components. Some of these are retained and the remainder returned to the donor</td>
</tr>
<tr>
<td>APPT</td>
<td>Activated Partial Thromboplastin Time</td>
</tr>
<tr>
<td>Blood Component</td>
<td>A therapeutic constituent of human blood (red cells, white cells, platelets, plasma, cryoprecipitate)</td>
</tr>
<tr>
<td>Blood Product</td>
<td>Any therapeutic product derived from human whole blood or plasma donations</td>
</tr>
<tr>
<td>BMS</td>
<td>Biomedical Scientist</td>
</tr>
<tr>
<td>BSQR</td>
<td>Blood Safety and Quality Regulations 2005</td>
</tr>
<tr>
<td>C10</td>
<td>Transport form issued by Antrim blood bank for units sent to Mid-Ulster and Whiteabbey Hospitals</td>
</tr>
<tr>
<td>CLL</td>
<td>Chronic Lymphocytic Leukaemia</td>
</tr>
<tr>
<td>CMV</td>
<td>Cytomegalovirus - a type of herpes virus which is transmissible via transfusion and can cause infection in immunosuppressed patients</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>Cold Agglutinins</td>
<td>Red cell antibodies that are not active at body temperature</td>
</tr>
<tr>
<td>Compatibility Label</td>
<td>Label, generated by the laboratory computer system and attached to the unit with a luggage tag; contains full patient ID and details of the unit to be transfused</td>
</tr>
<tr>
<td>Compatibility Report</td>
<td>Blood bank report issued with the first unit of blood which contains the patient details, blood group, antibody status and components issued.</td>
</tr>
<tr>
<td>Competency</td>
<td>Refers to Right Patient Right Blood Competencies</td>
</tr>
<tr>
<td>Component Traceability slip</td>
<td>Pink traceability slip issued with each unit; to be signed on commencement of transfusion and returned to blood bank as soon as possible</td>
</tr>
<tr>
<td>Crossmatched blood</td>
<td>Blood which has tested against the patients sample and is compatible</td>
</tr>
<tr>
<td>Cryo</td>
<td>Cryoprecipitate - contains proteins including factor VIII and Fibrinogen</td>
</tr>
<tr>
<td>DIC</td>
<td>Disseminated Intravascular Coagulation - activation of the coagulation and fibrinolytic pathways</td>
</tr>
<tr>
<td>EDTA</td>
<td>Anticoagulant required for blood transfusion samples</td>
</tr>
<tr>
<td>ET</td>
<td>Exchange Transfusion</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>FBC</td>
<td>Full Blood Count</td>
</tr>
<tr>
<td>FFP</td>
<td>Fresh Frozen Plasma - contains proteins including clotting factors e.g. Factor VIII</td>
</tr>
<tr>
<td>g/dl</td>
<td>unit of measurement of Haemoglobin</td>
</tr>
<tr>
<td>Group specific blood</td>
<td>Blood of the same ABO group as the patient, usually issued uncrossmatched in an emergency situation</td>
</tr>
<tr>
<td>H&amp;C</td>
<td>Health and Care Number</td>
</tr>
<tr>
<td>Hb</td>
<td>Haemoglobin</td>
</tr>
<tr>
<td>HCH</td>
<td>Health Care at Home</td>
</tr>
<tr>
<td>HDN</td>
<td>Haemolytic Disease of the Newborn - a condition in which foetal red cells are destroyed by maternal antibody, usually anti-D</td>
</tr>
<tr>
<td>HDNT</td>
<td>Hospital Diversion Nursing Team</td>
</tr>
<tr>
<td>HLA</td>
<td>Human Leucocyte Antigen</td>
</tr>
<tr>
<td>HPA 1a/5b</td>
<td>Human Platelet Antibodies</td>
</tr>
<tr>
<td>i.u.</td>
<td>International Units</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>IgG</td>
<td>Human Immunoglobulin preparation</td>
</tr>
<tr>
<td>INR</td>
<td>International Normalised Ratio - calculated from the Prothrombin time and used to monitor patients on oral anticoagulant therapy</td>
</tr>
<tr>
<td>Irradiated Products</td>
<td>Cellular components treated with irradiation to inactivate lymphocytes</td>
</tr>
<tr>
<td>ITP</td>
<td>Idiopathic Thrombocytopenic Purpura</td>
</tr>
<tr>
<td>IUT</td>
<td>Intrauterine Transfusion</td>
</tr>
<tr>
<td>IV</td>
<td>Intra Venous</td>
</tr>
<tr>
<td>MB FFP</td>
<td>This is plasma which has been subjected to virus photo inactivation in the presence of methylene blue.</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>NHSCT</td>
<td>Northern Health &amp; Social Care Trust</td>
</tr>
<tr>
<td>NIBTS</td>
<td>Northern Ireland Blood Transfusion Service</td>
</tr>
<tr>
<td>NIRBTP</td>
<td>Northern Ireland Regional Blood Transfusion Policy</td>
</tr>
<tr>
<td>NIRTC</td>
<td>Northern Ireland Regional Transfusion Committee</td>
</tr>
<tr>
<td>NPSA</td>
<td>National Patient Safety Agency</td>
</tr>
<tr>
<td>Obs</td>
<td>Clinical observations for blood transfusion purposes include Pulse, Temperature, Respirations and Blood Pressure</td>
</tr>
<tr>
<td>Paedipack</td>
<td>Up to 8 aliquots from a single donation labelled PFC1, PFC2 etc.</td>
</tr>
<tr>
<td>PCC</td>
<td>Prothrombin Complex Concentrate for the emergency reversal of warfarin in life threatening haemorrhage</td>
</tr>
<tr>
<td>Platelets</td>
<td>Play a primary role in the maintenance of haemostasis</td>
</tr>
<tr>
<td>Product Request form</td>
<td>Used to request blood components and products from Causeway Blood Bank</td>
</tr>
<tr>
<td>PT</td>
<td>Prothrombin Time</td>
</tr>
<tr>
<td>RBC</td>
<td>Red Blood Cells also referred to as FC (Filtered Cells)</td>
</tr>
<tr>
<td>RPRB</td>
<td>Right Patient Right Blood</td>
</tr>
<tr>
<td>SABRE</td>
<td>Serious Adverse Blood Reactions and Events - reporting body for the Medicines and Healthcare products Regulatory Agency</td>
</tr>
<tr>
<td>SBATs</td>
<td>Small Bore Air Tube System (Causeway site)</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>SHOT</td>
<td>Serious Adverse Blood Reactions and Events - reporting body for the Medicines and Healthcare products Regulatory Serious Hazards of Transfusion</td>
</tr>
<tr>
<td>Spiggotted</td>
<td>Seal unit with a blue bag plug (ordered from lab stores as Transfusion Bag Plug)</td>
</tr>
<tr>
<td>TACO</td>
<td>Transfusion Associated Circulatory Overload</td>
</tr>
<tr>
<td>TA-GvHD</td>
<td>Transfusion Associated Graft versus Host Disease - a serious condition in which allogeneic lymphocytes attack the tissues of the individual to whom they have been transplanted or transfused.</td>
</tr>
<tr>
<td>TRALI</td>
<td>Transfusion Related Acute Lung Injury</td>
</tr>
<tr>
<td>Unique Identifier number</td>
<td>Hospital Number or H&amp;C (must be on patient's wristband)</td>
</tr>
<tr>
<td>Unit</td>
<td>Blood Components are issued in units</td>
</tr>
<tr>
<td>X Match</td>
<td>Cross match</td>
</tr>
<tr>
<td>yellow luer slip end</td>
<td>used to seal partially used units, available from Haemovigilance</td>
</tr>
</tbody>
</table>
Appendix 1 Adult Acute Transfusion Reaction Flowchart  (Handbook of Transfusion Medicine 2007)

Symptoms/signs of acute transfusion reaction
Fever; chills; tachycardia; hyper- or hypotension; collapse; rigors; flushing; urticaria; bone, muscle, chest and/or abdominal pain; shortness of breath; nausea; generally feeling unwell; respiratory distress

Stop the transfusion and call a doctor
- Measure temperature, pulse, blood pressure, respiratory rate, O₂ saturation
- Check the identity of the recipient with the details on the unit and compatibility label or tag

Febrile non-haemolytic transfusion reaction
- If temperature rise less than 1.5°C, the observations are stable and the patient is otherwise well, give paracetamol
- Restart infusion at slower rate and observe more frequently

ABO incompatibility
- Stop transfusion
- Take down unit and giving set
- Return intact to blood bank
- Commence iv saline infusion
- Monitor urine output/catheterise
- Maintain urine output at > 100 ml/hr
- Give furosemide if urine output falls/absent
- Treat any DIC with appropriate blood components
- Inform hospital transfusion department immediately

Suspected ABO incompatibility

Severe allergic reaction
Bronchospasm, angioedema, abdominal pain, hypotension
- Stop transfusion
- Take down unit and giving set
- Return intact to blood bank along with all other used/unused units
- Give chlorphenamine 10mg slow iv
- Commence O₂
- Give salbutamol nebuliser
- If severe hypotension, give adrenaline (0.5 ml of 1 in 1000 intramuscular)*
- Clotted sample to transfusion laboratory
- Saline wash future components (*equivalent to 0.5 mg im)

Haemolytic reaction/bacterial infection of unit
- Stop transfusion
- Take down unit and giving set
- Return intact to blood bank along with all other used/unused units
- Take blood cultures, repeat blood group/crossmatch/FBC, coagulation screen, biochemistry, urinalysis
- Monitor urine output
- Commence broad spectrum antibiotics if suspected bacterial infection
- Commence oxygen and fluid support
- Seek haematological and intensive care advice

Other haemolytic reaction/bacterial contamination

Acute dyspnoea/hypotension
Monitor blood gases
Perform CXR
Measure CVP/pulmonary capillary pressure

Normal CVP

Raised CVP

TRALI
- Clinical features of acute LVF with fever and chills
- Discontinue transfusion
- Give 100% oxygen
- Treat as ARDS – ventilate if hypoxia indicates
Appendix 2
ABO Blood Groups

<table>
<thead>
<tr>
<th>Blood Group</th>
<th>Patient's Cells</th>
<th>Patient's Plasma</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><img src="image1" alt="A red cell" /></td>
<td><img src="image2" alt="anti-B" /></td>
</tr>
<tr>
<td>B</td>
<td><img src="image3" alt="B red cell" /></td>
<td><img src="image4" alt="anti-A" /></td>
</tr>
<tr>
<td>AB</td>
<td><img src="image5" alt="AB red cell" /></td>
<td><img src="image6" alt="None" /></td>
</tr>
<tr>
<td>O</td>
<td><img src="image7" alt="O red cell" /></td>
<td><img src="image8" alt="anti-A and anti-B" /></td>
</tr>
</tbody>
</table>

www.learnbloodtransfusion.org.uk

<table>
<thead>
<tr>
<th>Patient's Blood Group</th>
<th>COMPATIBLE DONOR RED CELLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>A</td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td>✗</td>
</tr>
<tr>
<td>AB</td>
<td>✓</td>
</tr>
<tr>
<td>O</td>
<td>✗</td>
</tr>
</tbody>
</table>
Appendix 3

Haemovigilance Report Form

This form must be completed in the event of ANY blood transfusion related incident and returned asap to the NHSCT Haemovigilance Office, Bretten Hall, Antrim Hospital

Incidents may include - Incorrect Blood Component Transfused / Over transfusion / Inappropriate requests for components / Wrong Blood In Tube / Avoidable Wastage / Major Haemorrhage Protocol / non-conformance with RPRB / communications issues / anti-D events / Near Misses

Patient Details if applicable (complete or affix addressograph label)

<table>
<thead>
<tr>
<th>Full Name</th>
<th>Unique Identifier</th>
<th>DoB</th>
<th>Hospital</th>
<th>Ward</th>
<th>Date</th>
<th>Time (24 hrs)</th>
</tr>
</thead>
</table>

Component Transfused

<table>
<thead>
<tr>
<th>Red Cells</th>
<th>FFP</th>
<th>Platelets</th>
<th>Other</th>
</tr>
</thead>
</table>

Tick implicated component if applicable

Description of Incident

Immediate Action Taken

<table>
<thead>
<tr>
<th>Reported By</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>

Trust Incident and Near Miss Reporting Form completed Y / N
Appendix 4

Suspected Transfusion Reaction Report

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Diagnosis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Birth</td>
<td>Product:</td>
</tr>
<tr>
<td>Hospital No.</td>
<td>Unit Number:</td>
</tr>
<tr>
<td>Ward ...</td>
<td>Date &amp; Time started:</td>
</tr>
<tr>
<td>Date: ... / ... / ...</td>
<td>Time of reaction:</td>
</tr>
<tr>
<td>Time: ... / A.M / P.M</td>
<td>Volume transfused:</td>
</tr>
<tr>
<td>Is the patient wearing an armband? Y / N</td>
<td></td>
</tr>
<tr>
<td>Has patient identity been verified? Y / N</td>
<td></td>
</tr>
</tbody>
</table>

Baseline observations: Temp...... Pulse....... BP....... Resp.......  
Variation of observations: Temp...... Pulse....... BP....... Resp....... 

Observed Clinical Signs and Symptoms (Circle where appropriate)

<table>
<thead>
<tr>
<th></th>
<th>Hypotension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprehension / feeling of doom</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Increased pulse rate</td>
<td>Temperature increase &gt; 1°C above baseline</td>
</tr>
<tr>
<td>rigor</td>
<td>Decreased urinary output</td>
</tr>
<tr>
<td>chill</td>
<td>dark or red urine</td>
</tr>
<tr>
<td>jaundice</td>
<td>itching</td>
</tr>
<tr>
<td>diffuse bleeding / petechiae</td>
<td>Breathless / dyspnoea</td>
</tr>
<tr>
<td>urticaria</td>
<td>pain over infusion site</td>
</tr>
<tr>
<td>back pain / loin pain</td>
<td>nausea / vomiting</td>
</tr>
<tr>
<td>chest pain / chest tightness</td>
<td>allergic</td>
</tr>
<tr>
<td>anaphylaxis</td>
<td>falling haemoglobin</td>
</tr>
</tbody>
</table>

All transfusion reactions, including delayed reactions, must be reported to the blood bank

Suggested Action

- Stop transfusion immediately
- Evaluate airway, breathing and circulation.
- Summon medical assistance.
- Using new giving set keep line open with saline.
- Treat symptoms.
- Verify identity of patient, ABO group of patient and donor unit. Inform the blood bank immediately if a discrepancy is found as another patient may also be at risk of receiving the wrong blood.

Send the following to blood bank: -

- All recently transfused packs, with administration set in situ where applicable.
- Blood samples - group and screen sample, FBC, coagulation screen.
- Sample of urine

Additional blood samples

- Biochemistry - Urea and electrolytes, liver function tests
- Bacteriology - Blood cultures for aerobic and anaerobic culture.

If a severe reaction is suspected contact the Consultant Haematologist on call.

Signature of medical officer: ____________________________________________
Name in block capitals: ____________________________________________

Please forward a copy of this report to the Haemovigilance practitioner.