Western Health and Social Care Trust

Blood Component Transfusion Policy

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Title:	Blood Component Transfusion Policy			
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1.0 INTRODUCTION

1.1 Background

Errors in the requesting, blood sampling, collection and administration of Blood Components can lead to significant risks for patients. Since its launch in 1996, the Serious Hazards of Transfusion (SHOT) scheme has continually shown that 'incorrect Blood Component transfused' episodes are a frequently reported transfusion hazard. These wrong blood incidents are mainly due to human error leading to misidentification of the patient and can lead to life-threatening haemolytic transfusion reactions and other significant morbidities[1].

The blood transfusion process has never been more regulated, with rules and guidance arising variously from statutory law, national and international sources, Haemovigilance schemes, professional organisations and patient groups, all with the aim of improving the quality, safety and appropriateness of Blood Component provision.

This policy provides guidance for transfusion of all Blood Components (Red Cells, Platelets, Fresh Frozen Plasma and Cryoprecipitate) regardless if the patient is being transfused in a hospital, home environment or out of hospital facility (e.g. by the Rapid Response Nursing Team or Acute Care at Home Team).

1.2 Purpose

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[2] (Appendix 1).

This policy aims to ensure that there is a consistent approach to the procedures involved in the blood transfusion process and that staff involved in the process have access to a document with clear and concise information. It has been written to standardise the care of the patient throughout the blood transfusion process, to ensure appropriateness of blood component transfusions, safe administration of transfusions and the correct management of any adverse events.

2.0 SCOPE OF POLICY

This policy aims to provide guidance to a variety of staff involved in the blood transfusion process for the safe and appropriate use of Blood Components within the WHSCT. Due to the various roles that may be undertaken by various staff groups, it is important that those staff involved in the blood transfusion process understand their roles and responsibilities within the process.

This Policy has been written with reference to national guidelines by the British Society for Haematology[1], Serious Hazards of Transfusion[3], the Health Service Circular HSS (MD) 17/2011[4] and the legal requirements outlined by the Blood Safety and Quality Regulations[5].

The Blood Safety and Quality Regulations[5] define Blood Components as a therapeutic constituent of blood (Red Cells, Platelets, Fresh Frozen Plasma, Cryoprecipitate or Granulocytes), whereas blood products are derived from whole blood or plasma (e.g. solvent detergent SD-FFP, albumin and anti-D immunoglobulin) and are classed as medicinal products. Blood Components are excluded from the legal definition of medicinal products[6] and must be 'authorised' or a 'written instruction' rather than 'prescribed'[7]. However, because SD-FFP (e.g. Octaplas) is classed as a medicinal product, it must therefore be prescribed. The rest of the administration process for SD-FFP should follow the same guidelines as for Blood Components[1].

This policy does not apply to the administration of Blood Products (other than SD-FFP as stated above). Blood Products require specific administration and supplier's instructions must be followed (as per leaflet insert provided with the Blood Product).

The Policy comprises operational guidance on the administration of Blood Components and the management of the transfused patient. The policy defines the correct procedure for patient information to be provided pre-transfusion, written instruction for Blood Components and each of the following steps of the blood transfusion process:-

- Competency 1: Obtaining a Pre-Transfusion Sample
- Competency 2: Organising Delivery/Receipt of a Blood component
- Competency 3: Collecting a Blood Component for Transfusion
- Competency 4: Administration of a Blood Component

This Policy is ratified as the ONLY WHSCT Blood Transfusion Policy and must be followed by all staff participating in the blood transfusion process. This Policy supersedes the Policy for Blood Component Transfusion in Adults (February 2013) and Policy for Blood Component Transfusion in Neonates and Older Children (May 2013).

3.0 DEFINITIONS / ABBREVIATIONS

3.1 Definitions

a. Adult – greater than or equal to 16 years of age
b. Blood Components refer to units, paedipacks or pooled units of:
   - Red Blood Cells
   - Platelets
   - Fresh Frozen Plasma
   - Cryoprecipitate
   - Granulocytes
c. Child – greater than or equal to 1 year and less than 16 years of age
d. Filtered Cells – Red Blood Cells
e. Medicines and Healthcare products Regulatory Agency - governs safety and quality of Blood Components as per the Blood Safety and Quality Regulations

f. IntelliSpace Critical Care and Anaesthesia - an electronic documentation application used in intensive care units
g. IntelliVue Clinical Information Portfolio – ICIP - an electronic documentation application used in intensive care units
h. Infant – greater than 28 days to less than one year
i. Major Haemorrhage – a significant bleed that requires rapid intervention to stabilize the patient
j. Methylene blue treated Fresh Frozen Plasma – Non-UK sourced single donor Fresh Frozen Plasma treated with methylene blue to be administered to those born after 01/01/1996
k. Neonates – up to 28 days of postnatal age
l. Patient – Also used to denote out-patient and/or client
m. Professional Registration Number – General Medical Council, Nursing and Midwifery Council, or Health Care Professions Council Number
n. Serious Adverse Blood Reactions and Events - online platform for reporting serious adverse events and reactions to the Medicines and Healthcare products Regulatory Agency and Serious Hazards of Transfusion
o. Serious Hazards of Transfusion - United Kingdom's independent, professionally-led Haemovigilance scheme
p. Special Requirements – additional clinical requirements for a patient (e.g. irradiated blood components)
q. Thrombocytopenia – low platelet count
r. Unit – refers to one adult blood component pack or one paedipack
s. Blood Component Transfusion Record refers to:-
   - Transfusion Record used for patient who is 16 years onwards and requires a Blood Component transfusion
   - Transfusion Record used for patient who is birth to 16 years and requires a Blood Component transfusion
   - Electronic documentation used in Clinical Areas (e.g. Critical Care Unit, Altnagelvin Hospital) for patient who requires a Blood Component transfusion
t. Written instruction – the written order for authorising the Blood Component to be transfused (previously referred to as prescription)

3.2 Abbreviations

ALL – Acute Lymphoblastic Leukaemia
ANTT - Aseptic Non Touch Technique
APTT - Activated Partial Thromboplastin Time
ATG – Anti-Thymocyte Globulin
BSH – British Society for Haematology (formerly BCSH – British Committee for Standards in Haematology)
BMS – Biomedical Scientist
BSQR – Blood Safety and Quality Regulations
CMV – Cytomegalovirus
DAT - Direct Antiglobulin Test
DIC – Disseminated Intravascular Coagulation
FC – Filtered Cells

FFP – Fresh Frozen Plasma
GMC – General Medical Council
H&C number – Health and Care Number (also known as HCN)
Hb - Haemoglobin
HDN – Haemolytic Disease of the New-born
HIT – Heparin-Induced Thrombocytopenia
HLA – Human Leucocyte Antigen
HPA – Human Platelet Antigen
HTC – Hospital Transfusion Committee
HTT – Hospital Transfusion Team
HUS – Haemolytic Uraemic Syndrome
ICCA - IntelliSpace Critical Care and Anaesthesia
ICH – Intracranial Haemorrhage
ICIP - IntelliVue Clinical Information Portfolio
ITP – Immune Thrombocytopenia
IV – Intravenous
IVH – Intraventricular Haemorrhage
LDH – Lactate Dehydrogenase
MB – Methylene Blue
MHRA - Medicines and Healthcare products Regulatory Agency
MSBOS – Maximum Surgical Blood Ordering Schedule
NIBTS – Northern Ireland Blood Transfusion Service
NAIT – Neonatal Alloimmune Thrombocytopenia
NI – Northern Ireland
NIPPV – Non-Invasive Positive Pressure Ventilation
NITC – Northern Ireland Transfusion Committee
NMC – Nursing and Midwifery Council
NPSA – National Patient Safety Agency
NWIH – North West Independent Hospital
ODP – Operating Department Practitioner
OH&PCC – Omagh Hospital and Primary Care Complex
PICC – Peripherally Inserted Central Catheter
PPE – Personal Protective Equipment
PT - Prothrombin Time
QI – Quality Improvement
SABRE – Serious Adverse Blood Reactions and Events
SD-FFP - Solvent Detergent Fresh Frozen Plasma
SHOT - Serious Hazards of Transfusion
SWAH - South West Acute Hospital
TACO – Transfusion Associated Circulatory Overload
TTP – Thrombotic Thrombocytopenic Purpura
UK – United Kingdom
vCJD – variant Creutzfeldt-Jakob Disease
WHO - World Health Organisation
WHSCT – Western Health and Social Care Trust

4.0 ROLES AND RESPONSIBILITIES

4.1 Chief Executive

4.1.1 Overall responsibility for ensuring that there is a safe system for transfusion practice within the WHSCT.

4.1.2 Ensure compliance with the Blood Safety and Quality Regulations[5].

4.2 Senior Managers within Directorates

4.2.1 Ensure that there is senior management commitment to the HSS Circular HSS (MD) 17/2011[4].

4.2.2 Ensure appropriate membership and function of the HTC.

4.2.3 Ensure appropriate composition and function of the HTT.

4.2.4 Ensure that staff involved in the blood transfusion process has access to and adhere to the WHSCT Blood Component Transfusion Policy.

4.3 Hospital Transfusion Committee

4.3.1 Promotes best practice through local policies, procedures and/or guidelines based on regional and national guidelines.

4.3.2 Leads multi-professional audit and/or QI projects on the use of Blood Components within the WHSCT.

4.3.3 Audits blood transfusion practice against relevant regional and national guidelines.

4.3.4 Provides feedback on audit of transfusion practice, use of Blood Components and QI projects to all hospital staff involved in blood transfusion.

4.3.5 Promotes the education and training of all clinical, laboratory and support staff involved in clinical aspects of the blood transfusion process.

4.3.6 Facilitates Haemovigilance training and competency assessments to comply with the requirements of the HSS Circular HSS (MD) 17/2011[4].

4.3.7 Are a focus for local contingency planning and management of blood shortage.

4.3.8 Reports regularly to the NITC.

4.3.9 Participates in the activities of the NITC.

4.3.10 Contributes to the WHSCT Clinical Governance agenda.

4.4 Hospital Transfusion Team

4.4.1 Assists in the implementation of the HTCs objectives.

4.4.2 Promotes and provide advice and support to clinical teams on the appropriate and safe use of Blood Components.

4.4.3 Actively promotes the implementation of good transfusion practice.

4.4.4 Are a resource for training of all clinical, laboratory and support staff involved in clinical aspects of the blood transfusion process and/or patient blood management.

4.4.5 Promotes and provides advice and support to the NWIH and Foyle Hospice on the appropriate and safe use of Blood Components and/or patient blood management.

4.5 Haemovigilance Practitioners

4.5.1 Promote safe transfusion practice, ensure appropriateness of blood component transfusion and challenge poor compliance.

4.5.2 Support the development and delivery of an education programme that is accessible to all staff involved in the blood transfusion process.

4.5.3 Responsible for training staff in the blood transfusion process (e.g. Medical Staff, Nurses, Midwives, ODPs, Porters, Health Care Assistants) and providing an overview of the WHSCT Blood Component Transfusion Policy.

4.5.4 Investigate and feedback on any Blood Component transfusion related incidents to relevant staff.

4.5.5 Contribute to the review and update of Blood Transfusion policies, procedures and / or guidelines.

4.5.6 Co-ordinate the reporting to external bodies as required (e.g. MHRA / SHOT) and verifies completion of corrective actions.

4.5.7 Act as a transfusion specialist to advise individuals, clinical teams and external agencies.

4.5.8 Report to the HTT and HTC on:

a. Competency issues of staff involved in the blood transfusion process.
b. Audits and/or QI projects carried out (local, regional and national).
c. Proposed changes to policy and procedures accordingly.
d. Risks identified through the incident reporting process and lessons to be learned and changes implemented.

4.6 Ward Managers / Lead Nurses / Clinical Directors / Clinical Leads / Line Managers

4.6.1 Ensure that staff within their department adheres at all times to the WHSCT Blood Component Transfusion Policy.

4.6.2 Ensure that staff participating in the blood transfusion process have valid Haemovigilance training and competency assessments (NB competency assessments not required for staff involved in 'authorising a blood component for transfusion' – section 15.0).

4.6.3 Ensure that Haemovigilance incidents are reported and managed as per the WHSCT Incident and Reporting Policy and Procedures.

4.6.4 Implement recommended actions arising from investigations of incidents.

4.6.5 Identify staff to undertake role of 'Assessor' for 'Right Patient, Right Blood'.

4.7 'Assessors' for 'Right Patient, Right Blood'

4.7.1 Ensure they have valid Haemovigilance training and competency assessments to participate in the blood transfusion process.

4.7.2 Once attended the 'New Assessor Day', will undertake 'Competency Assessments' with staff in the clinical area using the WHSCT Competency Proformas.

4.7.3 Ensure all 'Right Patient, Right Blood' training and competency assessment records for staff in the Clinical Area are accurate and kept up to date.

4.7.4 Endeavour to attend 18 month 'Assessor Update' session.

4.8 Individual Staff

All staff members involved in the blood transfusion process must:

4.8.1 Ensure they only participate in the blood transfusion process if they have valid Haemovigilance training and competency assessments (NB competency assessments not required for staff involved in 'authorising a blood component for transfusion' – section 15.0).

4.8.2 Adhere at all times to the WHSCT Blood Component Transfusion Policy.

4.8.3 Inform the Line Manager and Haemovigilance Practitioner of any errors or omissions from the WHSCT Blood Component Transfusion Policy and report on Datix where appropriate.

4.9 Summary of roles and responsibilities for staff involved in the Blood Component transfusion process

TABLE 1

Transfusion Process	Staff member permitted to undertake task (only if have valid Haemovigilance training & competency assessment - section 5.0)
Obtaining a pre-transfusion sample	• Health Care Assistants • Medical Staff • ODPs • Phlebotomists • Registered Nurses / Midwives
Blood Collection from Blood Bank at Altnagelvin / SWAH	• Porters
Blood Collection from Satellite Blood Fridge (Altnagelvin Hospital)	• ODPs • Porters • Theatres / Recovery Registered Nurses only
Blood Collection from Blood Issue Fridge (OH&PCC)	• Health Care Assistants • Registered Nurses
Authorisation of a Blood Component for transfusion *NB: Competency Assessment not required for this activity*.	• Medical Staff • Registered Nurses who have undertaken training on 'non-medical authorisation of blood'
Administration of a Blood Component for transfusion	• ODPs • Medical Staff • Registered Nurses / Midwives
Medical / Nursing / Midwifery students must not be involved in obtaining a pre-transfusion sample, collecting a Blood Component, authorising a Blood Component for transfusion or undertaking pre-administration checks.	

5.0 HAEMOVIGILANCE TRAINING AND COMPETENCY ASSESSMENT

5.1 Training

5.1.1 All staff involved in the blood transfusion process, including staff involved in authorising (providing written instruction) Blood Components, must have completed Haemovigilance training every three years[4] (two years if involved in collecting a Blood Component for transfusion[5]).

5.1.2 Haemovigilance training may be either a face to face training session delivered by a Haemovigilance Practitioner or completion of relevant modules on the e-learning programme www.learnbloodtransfusion.org.uk.

5.2 Competency Assessment

5.2.1 There are four competencies relating to the blood transfusion process and staff involved in these activities must have competency assessments completed every three years[8]:-

- Competency 1: Obtaining a pre-transfusion sample.
- Competency 2: Organising delivery / receipt of a Blood Component.
- Competency 3: Collecting a Blood Component for transfusion.
- Competency 4: Administration of a Blood Component.

5.2.2 Competency assessments are a practical assessment undertaken by a trained 'Assessor' (who has completed 'Assessor' training delivered by a Haemovigilance Practitioner and has valid Haemovigilance training and assessment). The 'Assessor' maintains a record of staff details and dates when competency assessments are completed (for availability in the clinical area) and also ensures information is shared with the relevant staff member in the WHSCT who records the information on Trust records.

6.0 PATIENT BLOOD MANAGEMENT

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 appropriate use of Blood Components.

The concept of 'Patient Blood Management' puts the patient at the heart of decisions regarding the need for a blood component transfusion to ensure that they receive the best treatment and that avoidable and inappropriate use of Blood Components is reduced[9]. A key element of Patient Blood Management is the prevention of blood being unnecessarily removed from the patient, particularly by reducing phlebotomy blood loss due to unnecessary laboratory tests[10].

Every effort should be made to reduce or eliminate the need for transfusion by considering alternative approaches to patient management[9]. Alternatives include:-

- Various surgical methods to prevent blood loss.
- Cell Salvage (not currently available in the WHSCT).
- Various anaesthetic methods to minimise blood loss.
- Oral or IV Iron.
- Erythropoietin.
- Tranexamic Acid.

6.1 Single Unit Red Cell Transfusion

Single Unit Red Cell Transfusion is recommended for adults (or equivalent volumes calculated based on body weight for neonates, infants, children or adults with low body weight) who do not have active bleeding, with further clinical assessment to determine whether additional transfusion is required[1]. Assessment of post-transfusion Hb level can be performed as early as 15 minutes following transfusion if the patient is not actively bleeding[12] although laboratory measures are not the sole deciding factor for a Blood Component transfusion. The decision to transfuse should be based on clinical assessment underpinned by relevant guidelines.

6.2 Investigation and Management of the Adult Patient with Anaemia[13]

Detection, investigation and management of anaemia plays an important part not only in improving the care and outcome for the patient, but also in reducing the need for blood transfusion. For planned surgery, the arrangements for pre-operative assessment should permit the diagnosis and correction of anaemia in advance of surgery and optimisation of haemostatic function peri-operatively.

The NITC has developed guidance (through consultation with a range of healthcare professionals in primary and secondary care) on Management of Iron Deficiency Anaemia.

6.3 Measures to minimise the risks of Blood Component transfusion to Neonates and Infants

6.3.1 Minimise blood loss – most red cell transfusions are given to replace blood drawn for monitoring, therefore micro-techniques, non-invasive monitoring and avoidance of unnecessary testing should be used to reduce transfusion needs.

6.3.2 Minimise donor exposure – neonates and infants who may require several red cell transfusions within a few weeks should be allocated to a 'Paedipack' system, where one donation is divided into five to six smaller volume packs that can be used for sequential transfusions over the shelf life of the red cells. This means, the number of donors whose blood is transfused to the neonate or infant is minimised. Close liaison between the clinical area and Blood Bank is essential to achieve optimal use of paedipacks and ensure that all neonates or infants likely to receive more than one transfusion are identified. The Blood Bank should be advised at the time of first transfusion of all neonates and infants less than 30 weeks gestation or with haemolytic disease who may require multiple transfusions.

7.0 POSITIVE PATIENT IDENTIFICATION

a. Positive patient identification is a process which when followed will promote good patient identification practice and reduce the risk of misidentification from occurring which could result in an incompatible Blood Component transfusion. Therefore, accurate identification of patients at all stages of the blood transfusion process is essential. Within the WHSCT, all patients involved in the blood transfusion process must wear a patient identification band.

b. Positive patient identification must be undertaken with the patient (or patient's carer or relative who can verify the patient's official identification). If there are any patient identification discrepancies at any stage of the blood transfusion process, they must be investigated and the information verified and corrected before proceeding to the next stage of the process[1].

c. Within the WHSCT, the unique identification number to be used is the H&C number. If the patient does not have a H&C number (i.e. not registered with a General Practitioner in Northern Ireland), the Hospital Number can be used. Blood Bank must be informed of these situations.

d. Where there is a language barrier, consider the use of a translator to positively identify the patient.

e. Refer also to the WHSCT Patient & Client Identification Policy

7.1 Patient who is capable of giving an accurate and reliable response

Positively identify the patient by: -

7.1.1 Asking the patient for their official first name (as it appears on their birth certificate, passport or driving licence), their surname and date of birth.

7.1.2 Asking the patient to spell their official first name and surname.

7.1.3 Confirming that these details match those on the patient's identification band.

7.1.4 Confirming that the official first name, surname, date of birth and unique identification number on the patient identification band corresponds with details on the relevant blood transfusion documentation.

7.2 Patient unable to give an accurate and reliable response (e.g. paediatric patients who are unable to respond competently, unconscious or confused patients)

7.2.1 The patient's official first name, surname, date of birth and unique identification number must be identical to those on the patient identification band, case notes and the relevant blood transfusion documentation.

7.2.2 Confirm patient identification details with another member of staff and/or patient's carer or relative who can verify the patient's official identification details.

7.3 Unidentified patient

7.3.1 The unique identification number and gender are the minimum patient identifiers required.

7.3.2 The unique identification number and gender must be identical to those on the patient identification band and the relevant blood transfusion documentation.

7.3.3 As soon as the patient identification details become available and the patient is stable (i.e. not in the middle of surgery or Blood Component transfusion); the patient requires a new patient identification band (with the official first name, surname, date of birth and unique identification number) and a repeat pre-transfusion sample must be sent to Blood Bank.

7.4 Neonate or Infant not yet named

7.4.1 Patient's first name for the neonate or infant not yet named is "Infant" for single birth. For multiple births, first name will be InfantA, InfantB etc. The neonate or infant's first name, surname, date of birth and unique identification number must be identical to those on the patient identification band, case notes and the relevant blood transfusion documentation.

7.4.2 For the new-born initially known as "Infant" and then given a name, relevant documentation and the patient identification band must be updated accordingly.

7.4.3 Any further pre-transfusion samples should use the neonate or infant's correct given name (i.e. the same as the updated patient identification band).

7.4.4 Blood Bank can arrange for data recorded under "Infant" on the Laboratory system to be merged providing that the unique identification number, surname and date of birth of the neonate or infant remain the same. A repeat sample need not be taken once the neonate or infant is named.

7.4.5 If a neonate or infant has a change in 'Surname', contact Blood Bank to ascertain if a repeat sample is required.

7.5 Cord Sample

For RhD-negative pregnant women, a cord sample is used to determine the RhD group of the new-born, thus identifying the mother who must receive post-delivery prophylactic anti-D immunoglobulin.

7.5.1 Taken from the placental end of the cord into a pink topped EDTA sample bottle.

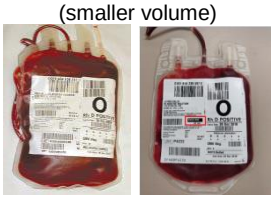
7.5.2 The sample and form are labelled with the mother's identification details (as per the mother's identification band).

7.5.3 The sample is marked as "Cord Sample" – handwritten in the 'Address' field of the sample bottle (Appendix 2).

7.5.4 If there is difficulty in obtaining a cord sample, a blood group sample must be taken from the new-born.

8.0 SUMMARY OF STORAGE OF BLOOD COMPONENTS

TABLE 2

BLOOD COMPONENTS	STORAGE	LIFESPAN
Red Cells / Paedipacks (smaller volume) 	Temperature controlled fridge 4°C ± 2°C Never stored in Domestic / Pharmacy / Ward Fridge Transfusion must be completed within 4 hours of removal from controlled temperature storage	35 days Expires 12 midnight on date shown
Platelets 	Agitator in Blood Bank (22 ± 2ºC i.e. must never be put in a Fridge) Transfuse as soon as possible after arrival in the clinical area	5 to 7 days Expires 12 midnight on date shown
FFP 	Freezer – then thawed (may take 30 minutes) Once thawed, can be stored in temperature controlled fridge (4°C ± 2°C) in Blood Bank for 24 hours. Transfusion must be completed within 4 hours of removal from controlled temperature storage	Transfuse as soon as possible
Cryoprecipitate 	Freezer – then thawed (may take 30 minutes) Once thawed, stored at room temperature (22 ± 2ºC) Transfusion must be completed within 4 hours of being thawed	Transfuse as soon as possible

9.0 INDICATIONS FOR A BLOOD COMPONENT TRANSFUSION AND DECISION TO TRANSFUSE

TABLE 3

Blood Component	Indications
Red Cells	• Where there is a clinical need to restore the oxygen carrying capacity in patients with anaemia or blood loss where alternative treatments are ineffective or inappropriate[2].
Platelets	• For the treatment or prevention of bleeding in patients with thrombocytopenia or platelet dysfunction[2].
Fresh Frozen Plasma	• If the WHSCT Major Haemorrhage Protocol is activated. • If virally-inactivated specific clotting factors are not available, pathogen reduced plasma may be used for factor replacement in congenital coagulation factor deficiency. • May be useful in bleeding patients with DIC, a prolonged PT and APTT. It should not be instituted based on laboratory tests alone but in those with active bleeding and in those requiring an invasive procedure[14]. • TTP: SD-FFP* for use in plasma exchange (use standard FFP if SD -FFP is unavailable)[14].
Cryoprecipitate	• Most common use is to enhance fibrinogen levels in dysfibrinogenaemia and the acquired hypofibrinogenaemia seen in massive transfusion and DIC[14]. • Can be considered in non-bleeding patients because of low fibrinogen for interventions at risk of significant bleeding, or in critical sites[14]. • Should be considered to replace fibrinogen and factor VIII when clinically significant bleeding and fibrinogen result is < 1.5g/L (< 2g/L in obstetric bleeding)[15].

*SD-FFP (Octaplas) is a blood product derived from the whole blood or plasma and is classed as a medicinal product[1].

9.1 The decision to transfuse must be based on a thorough clinical assessment and individual needs, including an evaluation of the patient's age, body weight, symptoms and concomitant medical conditions[1]. The reason and rationale for the decision to transfuse and the specific Blood Components to be transfused should be documented in the patient's case notes[1].

9.2 Blood Component transfusion should not be dictated by low blood counts alone (e.g. a low Hb concentration, platelet count or prolonged screening tests of coagulation). Such findings should be used together with the patient's clinical status to determine whether transfusion is necessary[9].

9.3 There have been a number of incidents reported to SHOT related to TACO and over-transfusion, particularly in vulnerable patients (including patients with low body weight, patients more than 70 years of age and those with concomitant medical conditions that predispose to TACO, including cardiac failure, renal impairment, hypoalbuminaemia and fluid overload). The clinical assessment of the patient should include an evaluation of the patient's age, body weight, symptoms and concomitant medical conditions when determining the volume and rate of a transfusion and whether a diuretic should be prescribed.

9.4 A formal pre-transfusion risk assessment for TACO should be performed whenever possible as TACO is the most commonly reported cause of transfusion-related death and major morbidity[16].

9.5 Where a TACO checklist is available on the Blood Component Transfusion Record, this must be completed in the non-emergency situation prior to authorising (providing written instruction) a Blood Component transfusion. If the patient is identified at being at risk of TACO, consideration must be given to the volume of Blood Component to be transfused, the rate of the transfusion, deciding whether diuretics should be prescribed and monitoring of vital signs during the transfusion[1].

9.6 It is imperative to avoid the unnecessary use of Blood Components. Blood Bank staff will query the appropriateness of requests for transfusion against the WHSCT thresholds for use of Blood Components (section 10.0). If the reason for the transfusion is unclear, clinicians will be advised to contact a Consultant Haematologist to discuss the Blood Component requirements.

9.7 Single unit Red Cell transfusions are recommended for adults (or equivalent volumes calculated based on body weight for children or adults with low body weight) who do not have active bleeding, with further assessment to determine if additional transfusion is required[1]. The concept that one unit of Red Cells in additive solution increases Hb by 10g/L should only be applied as an approximation for a 70-80kg patient[1].

9.8 For elective operations, the likelihood of requiring Red Cells is usually known for particular procedures. There are two categories of procedures:

- Likelihood that transfusion will be required is low and a “Group & Screen” request will suffice. In the unlikely event that a transfusion becomes necessary, this can be converted to a full crossmatch in approximately 45 minutes. For patients that have an antibody detected, Blood Bank will endeavour to have antigen negative Red Cells available if it is required for crossmatch.
- Those where the likelihood is that crossmatched blood will be required. The number of units to be crossmatched for a given procedure is listed in the MSBOS. A 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.
- If a patient with known antibodies is at risk of bleeding and a Blood Component transfusion is required, a group and screen sample must be sent to Blood Bank to allow sufficient time for antigen negative blood to be available.

10.0 TRANSFUSION THRESHOLDS [14, 15, 17, 18, 19]

10.1 Red Cell Transfusion Thresholds for Adults

Patients should not be transfused more than 20 g/l above their transfusion threshold.

TABLE 4

	STOP	CAUTION	GO
RED CELLS	**Hb > 90g/L** Likely inappropriate unless specific indications e.g. Major Haemorrhage.	**Hb < 90g/L** Appropriate with consideration if:- • Bone Marrow Failure. • Undergoing Chemotherapy / Radiotherapy. • Cardiac / Cerebrovascular history.	**Hb < 80g/L** • Likely to be appropriate for patient > 65 years. **Hb < 70g/L** • Likely to be appropriate for patient < 65 years. • Lower thresholds may be tolerated in patients without symptoms.

10.2 Red Cell Transfusion Thresholds for Pre-term Neonates*

TABLE 5

POSTNATAL AGE	SUGGESTED TRANSFUSION THRESHOLD Hb (g/L)		
	Ventilated	On oxygen / NIPPV	Off oxygen
First 24 hours	< 120	< 120	< 100
≤ Week 1 (day 1 – 7)	< 120	< 100	< 100
Week 2 (day 8 – 14)	< 100	< 95	< 75†
≥ Week 3 (day 15 onwards)	< 100	< 85	< 75†
Within the WHSCT, recommended volume: 20 ml/kg (transfusion duration 3 hours 30 minutes if risk of TACO).			

*Standard definition of preterm is < 37 weeks gestational age at birth but table applies to very preterm neonates (< 32 weeks).

†It is accepted that clinicians may use up to 85 g/L depending on clinical situation.

Table 5 does not include suggested thresholds for moderate to late term (≥32 weeks gestational age at birth) or term neonates as there is little evidence regarding the appropriate thresholds for these groups. Clinicians may consider similar thresholds as are used for preterm babies off oxygen.

10.3 Red Cell Transfusion in Infants and Children (excluding Neonates)

Paediatric transfusions should be calculated in ml/kg.

TABLE 6

RECOMMENDATIONS
1. Stable non-cyanotic patients: use a Hb threshold of 70 g/L pre-transfusion. 2. Unstable or symptomatic anaemia: higher threshold may be considered. 3. Non-bleeding: take into account pre-transfusion Hb in relation to transfusion threshold. 4. Within WHSCT, recommended volume: 15 ml/kg (transfusion duration 3 hours 30 minutes if risk of TACO)

10.4 Platelet Transfusion Thresholds for Adults

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. Platelets should not be administered routinely out with guidance.

TABLE 7

	STOP	GO
PLATELETS	**Do not routinely give Platelets without guidance.**	**PLATELET COUNT THRESHOLD:-** **10 X 10^9/L** Prophylactic Use Threshold **20 X 10^9/L** Central venous catheter excluding PICC line **30 X 10^9/L** Bleeding (WHO grade ≥ 2) but not severe **40 X 10^9/L** Lumbar puncture **50 X 10^9/L** Percutaneous liver biopsy / major surgery / therapeutic use in severe bleeding **80 X 10^9/L** Epidural anaesthesia, insertion & removal **100 X 10^9/L** Neurosurgery / ophthalmic surgery involving posterior segment of eye; multiple trauma, brain / eye injury, spontaneous intracerebral haemorrhage

10.5 Platelet Transfusion Thresholds for Neonates

TABLE 8

PLATELET COUNT (X 10^9/L)	INDICATION FOR PLATELET TRANSFUSION
< 25	Neonates with no bleeding (including neonates with NAIT if no bleeding and no family history of ICH)
< 50	Neonates with bleeding, current coagulopathy, before surgery, or infants with NAIT if previously affected sibling with ICH
< 100	Neonates with major bleeding or requiring major surgery (e.g. neurosurgery)
Typical transfusion volume: 10–20 ml/kg	

10.6 Platelet Transfusion Thresholds for Infants and Children (excluding Neonates)

TABLE 9

PLATELET COUNT (X 10^9/L)	CLINICAL SITUATION TO TRIGGER PLATELET TRANSFUSION
< 10	Irrespective of signs of haemorrhage (excluding ITP, TTP/HUS, HIT)
< 20	Severe mucositis Sepsis Laboratory evidence of DIC in the absence of bleeding* Anticoagulant therapy Risk of bleeding due to a local tumour infiltration Insertion of a non-tunnelled central venous line
< 40	Prior to lumbar puncture†
< 50	Moderate haemorrhage (e.g. gastrointestinal bleeding) including bleeding in association with DIC Surgery, unless minor (except at critical sites) including tunnelled central venous line insertion
< 75 - 100	Major haemorrhage or significant post-operative bleeding (e.g. post cardiac surgery) Surgery at critical sites: central nervous system including eyes
• Typical transfusion volume: 10–20 ml/kg for children <15 kg, or a single pack for children ≥15 kg • Maximum volume 1 pack	

*Note: routine screening by standard coagulation tests not advocated without clinical indication.

†It is accepted that prior to lumbar puncture some clinicians will transfuse platelets at higher counts (e.g. 50 X 10^9/l) in clinically unstable children, non ALL patients, or for the first Lumbar Puncture in newly diagnosed ALL patients to avoid haemorrhage and cerebrospinal fluid contamination with blasts, or at lower counts (≤20 X 10^9/l) in stable patients with ALL, depending on the clinical situation. These practices emphasise the importance of considering the clinical setting and patient factors.

10.7 Guidelines for Fresh Frozen Plasma Transfusion

10.7.1 Any person born after 1st January 1996 must receive non-UK MB treated FFP in order to reduce the risk of transfusion transmission of vCJD.

10.7.2 The indications for transfusing FFP are very limited and when transfused they can have unpredictable adverse effects.

Additional information[14]

10.7.3 Abnormal standard coagulation tests are poor predictors of bleeding risks in non-bleeding patients prior to an invasive procedure.

10.7.4 A detailed personal and family bleeding history, drug history and the bleeding risk associated with the planned procedure must be assessed as a matter of routine for all patients undergoing a planned procedure.

10.7.5 Standard coagulation tests should be considered in patients undergoing procedures with a moderate or high bleeding risk, any patients on anticoagulants, or those who have a personal/family bleeding history.

10.7.6 Patients with a positive personal/family bleeding history should be discussed with haematology as standard clotting tests may be normal in the presence of significant bleeding tendency.

10.7.7 The impact of commonly used doses of FFP to correct clotting results, or to reduce bleeding risk is very limited particularly when the PT ratio or INR are between 1.5-1.9.

10.7.8 For patients who have abnormal clotting tests and other factors (i.e. personal/family bleeding history, drug history, bleeding risk associated with planned procedure or thrombocytopenia) that indicate a significant bleeding risk during a procedure, then a starting dose of 15ml/kg of FFP can be considered, although this is not evidence based.

10.7.9 Plasma should not be used for volume replacement.

10.7.10 There is no evidence to support prophylactic use of FFP in non-bleeding patients with abnormal standard coagulation tests pre-procedures

10.7.11 PT and APTT do not reflect the true haemostatic status of patients with advanced liver disease. Abnormalities of PT and APTT need to be interpreted with caution in these patients.

10.8 Fresh Frozen Plasma use for Adults

TABLE 10

FRESH FROZEN PLASMA	STOP	CAUTION	GO
	• Prophylactic use in non-bleeding patients with abnormal standard coagulation test pre-procedures. • Prophylactic use for correction of abnormal clotting tests in Liver Disease. • Volume Expansion. • Reversal of Anticoagulant effects.	• Abnormal coagulation & clinically significant bleeding. • Abnormal coagulation & having invasive procedure with risk of significant bleeding.	• If WHSCT Major Haemorrhage Protocol is activated. • If virally-inactivated specific clotting factors are not available, pathogen reduced plasma may be used for factor replacement in congenital coagulation factor deficiency. • May be useful in bleeding patients with DIC, a prolonged PT and APTT. It should not be instituted based on laboratory tests alone but in those with active bleeding and in those requiring an invasive procedure[14]. • TTP: SD-FFP for use in plasma exchange (use standard FFP if SD-FFP is unavailable)[14].

TABLE 11

Body Weight (Kg)	Number of FFP units	Body Weight (Kg)	Number of FFP units	Body Weight (Kg)	Number of FFP units	Body Weight (Kg)	Number of FFP units
≤ 40	2	61 – 80	4	101 – 120	6	131 – 150	8
41 – 60	3	81 - 100	5	121 – 130	7		

10.9 Fresh Frozen Plasma Use for Neonates

TABLE 12

RECOMMENDATIONS
1. There is no evidence to support the routine use of FFP to try to correct abnormalities of the coagulation screen alone in non-bleeding neonates. 2. May be of benefit in neonates with clinically significant bleeding (including massive blood loss) or prior to invasive procedures with a risk of significant bleeding, and who have an abnormal coagulation profile, defined as a PT or APTT significantly above the normal gestational and postnatal age-related reference range (taking into account local reference ranges where available). 3. Not to be used for simple volume replacement or routinely for prevention of IVH.
Typical transfusion volume: 15–20 ml/kg

10.10 Fresh Frozen Plasma Use in Infants and Children (excluding Neonates)

TABLE 13

RECOMMENDATIONS
1. Prophylactic FFP should not be administered to non-bleeding children with minor prolongation of the PT / APTT including prior to surgery, although it may be considered for surgery to critical sites.
Typical transfusion volume: 15–20 ml/kg Transfuse FFP volumes of 15–20 ml/kg, using the higher volumes particularly in bleeding patients, and ensure monitoring of clinical outcome. However, care should be taken to avoid volume overload, particularly in vulnerable patients.

10.11 Guidelines for Cryoprecipitate Transfusion

10.11.1 Should be considered to replace fibrinogen and factor VIII when the fibrinogen result is less than 1g/L and other factors (i.e. personal/family bleeding history, drug history, bleeding risk associated with planned procedure) indicate a significant bleeding risk prior to having an invasive procedure; < 1.5 g/L if clinically significant bleeding; < 2 g/L in obstetric bleeding.

10.11.2 Any person born after 1 January 1996 must receive non-UK Methylene Blue treated Cryoprecipitate in order to reduce the risk of transfusion transmission of vCJD.

10.12 Cryoprecipitate Use for Adults

TABLE 14

	STOP	CAUTION
CRYOPRECIPITATE	• Indications very limited. • Not for non-bleeding patient with abnormal fibrinogen.	• Clinically significant bleeding & fibrinogen <1.5g/litre (< 2g/litre in obstetric bleeding[15]). • If fibrinogen <1g/litre, and other factors (i.e. personal/ family bleeding history, drug history, bleeding risk associated with planned procedure) indicate a significant bleeding risk prior to a procedure.

10.13 Cryoprecipitate Thresholds for Neonates

TABLE 15

RECOMMENDATIONS
The management of low fibrinogen is the same in neonates as in children (Table 16).

10.14 Cryoprecipitate Thresholds for Infants and Children (excluding Neonates)

TABLE 16

RECOMMENDATIONS
Prophylactic cryoprecipitate should not be routinely administered to non-bleeding children with decreased fibrinogen including prior to surgery. It may be considered for fibrinogen <1 g/l for surgery at risk of significant bleeding or to critical sites.
Transfuse cryoprecipitate volumes of 5–10 ml/kg, using the higher volumes particularly in bleeding patients, and ensure monitoring of clinical outcome and fibrinogen levels.

11.0 EMERGENCY BLOOD COMPONENTS

11.1 Major Haemorrhage

For management of a patient with a Major Haemorrhage, also refer to the WHSCT Major Haemorrhage Protocol.

11.2 Confirmation Sample (Appendix 3)

11.2.1 Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories state that “Unless secure electronic patient identification systems are in place a second sample should be requested for confirmation of the ABO group of a first time patient prior to transfusion, where this does not impede the delivery of urgent Red Cells or other components”[20]. This is known as a Confirmation Sample in the WHSCT.

11.2.2 In the event that a Confirmation Sample cannot be obtained during an emergency situation, a first time sample may be used but must be approved by the clinician in charge of the patient. The member of staff in Blood Bank will record the clinician’s details.

11.3 Summary regarding availability and location of Red Cells

TABLE 17

Urgency	Red Cells	LOCATION		
		Altnagelvin Hospital N=6 units	**SWAH N=4 units**	**OH&PCC N=6 units**
Immediately	Emergency Uncrossmatched O RhD negative Red Cells	Satellite Blood Fridge, Recovery Area, Main Theatres (First Floor)	Blood Issue Fridge, Blood Collection Area, Laboratory Department	Blood Issue Fridge, Cardiac Assessment Unit
15 minutes*	Group Specific blood	Blood Bank, Laboratory Department	Blood Bank, Laboratory Department	N/A
45 minutes*	Cross-matched blood	Blood Bank, Laboratory Department	Blood Bank, Laboratory Department	N/A

*After Blood Bank have received an accurately labelled pre-transfusion sample.

11.4 Emergency Uncrossmatched O RhD Negative Red Cells

Emergency Uncrossmatched O RhD Negative Red Cells can be given to any patient with any blood group and are the safest blood group to give when the patient's blood group is unknown or is not immediately available, for example in an emergency situation when there is no time to wait for either Group Specific or Crossmatched blood (and the risk of not transfusing outweighs the risk of waiting for a crossmatch).

11.4.1 Have not been crossmatched against the patient for transfusion.

11.4.2 Have the potential to cause a haemolytic transfusion reaction and therefore where the patient's blood group is known and confirmed, it is safer to transfuse the patient's ABO RhD Group Red Cells (Group Specific Red Cells).

11.4.3 Are not intended for use for neonates or infants less than 4 months as may not be CMV negative units and they lack the additional safety specification of neonatal components.

11.4.4 Are not intended for elective transfusions during pregnancy (excluding delivery) as may not be CMV negative units.

11.4.5 Patient may have alloantibodies, placing them at risk of a haemolytic transfusion reaction, if transfused with Emergency Uncrossmatched O RhD Negative Red Cells.

11.4.6 Before using Emergency Uncrossmatched O RhD Negative Red Cells:-

a. Endeavour to obtain a pre-transfusion sample from the patient (section 14.0).
b. Check if there are Group Specific units available for the patient which could be delivered to the clinical area in a timely manner.
c. Check if there are crossmatched units available for the patient which could be delivered to the clinical area in a timely manner.

11.5 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 RhD type (Group Specific Red Cells) can be provided in 15 minutes, provided the Blood Bank have a suitable accurately labelled sample for the patient.

11.6 Emergency Use of Fresh Frozen Plasma

In an emergency situation if the patient's Blood Group has not been established by an accurately labelled Group and Screen sample, Blood Bank will issue:

- 1st choice - Group AB Plasma (or Octaplas if available).
- 2nd choice - Group A Plasma.

11.7 Emergency Use of Platelets

In an emergency situation if the patient's Blood Group has not been established by an accurately labelled Group and Screen sample, Blood Bank will issue:

- 1st choice - Group AB Platelets (if available).
- 2nd choice - Group A Platelets.

11.8 Emergency Transfusion for Neonates or Infants less than 20 weeks

11.8.1 The Emergency Uncrossmatched O RhD Negative Red Cells prepared and stored in the designated Blood Issue Fridges are not intended for use in neonates or infants less than 20 weeks (may not be CMV negative or meet the particular specification and additional safety features deemed suitable for these recipients who are a vulnerable group[17]). However if a life-threatening haemorrhage situation and no suitable paediatric component available the next best adult component should be used until transfusion age-appropriate component available[17].

11.8.2 Contact Blood Bank if paedipacks are required in an emergency (all paedipacks are CMV negative and have additional safety features deemed suitable for neonates and infants).

11.8.3 Where small volume transfusions are required, attach a three way tap to the end of the Blood Component administration giving set and the required amount of Blood Component can then be drawn up into a syringe.

11.9 Requesting Emergency Uncrossmatched O RhD Negative Red Cells

A Blood Collection Form is not required when requesting Emergency Uncrossmatched O RhD Negative Red Cells.

TABLE 18

Altnagelvin Hospital & SWAH	OH&PCC

• Dial 6000.
• Inform Switchboard that a Porter is to collect Emergency Uncrossmatched O RhD Negative Red Cells from:-
  ○ **ALTNAGELVIN** = Satellite Blood Fridge, Recovery Area, Main Theatres.
  ○ **SWAH** = Blood Bank.
• Clinical area informs Blood Bank when Emergency Uncrossmatched O RhD Negative Red Cells removed.
	• Staff member in clinical area goes to Blood Collection Area, Cardiac Assessment Unit to collect Emergency Uncrossmatched O RhD Negative Red Cells.
	• Clinical area informs Blood Bank (**SWAH**) when Emergency Uncrossmatched O RhD Negative Red Cells removed.

11.10 Collecting, delivering and receiving Emergency Uncrossmatched O RhD Negative Red Cells

Staff responsible for collecting the Emergency Uncrossmatched O RhD Negative Red Cells from the designated Blood Issue Fridges must have valid Haemovigilance training (due every two years) and valid Competency 3 assessment 'Collecting a Blood Component for transfusion' (due every three years).

11.10.1 Two units are in each transport box in the designated Blood Issue Fridges.

11.10.2 Remove only one transport box (unless otherwise instructed). Do not break the seal on the transport box until the units are going to be transfused (Appendix 4).

11.10.3 Staff member completes details regarding date/time box removed and prints staff name on the Blood Traceability Records - located in clear plastic pocket on transport box and places back into the clear plastic pocket.

11.10.4 Complete documentation at the Blood Issue Fridge regarding box number removed, date and time removed, destination and print staff name.

11.10.5 Take immediately to the clinical area and hand to a qualified member of staff.

11.10.6 The staff member receiving the units in the clinical area must complete name, date and time in the section on both Blood Traceability Records 'Receipt of Unit in Clinical Area'.

11.10.7 Inform the Blood Bank when the Emergency Uncrossmatched O RhD Negative Red Cells are removed. This ensures the Blood Bank replaces the units for potential use elsewhere.

11.11 Collecting, delivering and receiving more than one unit of Red Cells (group specific or crossmatched units) at the same time in an Emergency

11.11.1 Clinical Area informs Blood Bank of number of units required.

11.11.2 Units may be provided in a sealed transport box (or one in a blue transport box and another unit in a sealed transport box) (Appendix 4).

11.11.3 If a sealed transport box is used, documentation pertaining to the transfusion - Blood Traceability Record(s) and 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 when collecting the transport box.

11.11.4 Take immediately to the clinical area and hand to a qualified member of staff.

11.11.5 The staff member receiving the units in the clinical area must complete name, date and time in the section on the Blood Traceability Records 'Receipt of Unit in Clinical Area'.

11.11.6 The seal of the box does not need to be broken when receive the transport box. Once the tamperproof seal is broken (i.e. when a decision has been made to transfuse one of the units), the time must be documented on the tag attached to the transport box (Appendix 4).

11.11.7 All units must be transfused within 4 hours of the time the seal was broken or returned to Blood Bank within 30 minutes of the time the seal was broken if the units are not going to be transfused (to avoid wastage of the unused units).

11.11.8 If none of the units are required and a sealed transport box was used, the transport box with the seal intact must be returned within 2 hours in order to avoid wastage of the units.

11.12 Collecting, delivering and receiving other Blood Components at the same time in an Emergency

11.12.1 Clinical Area informs Blood Bank of type and number of Blood Components required.

11.12.2 Documentation pertaining to the transfusion - Blood Traceability Records and Compatibility Report will be located:-

- FFP - in the pocket on the front of the box. The seal of the box does not need to be broken when collecting the transport box.
- Platelets or Cryoprecipitate – in the white plastic transit bag along with the Blood Component.

11.12.3 Take immediately to the clinical area and hand to a qualified member of staff.

11.12.4 The staff member receiving the units in the clinical area must complete name, date and time in the section on both Blood Traceability Records 'Receipt of Unit in Clinical Area'.

11.12.5 If a transport box has been used, the seal of the box does not need to be broken when receive the transport box. Once the tamperproof seal is broken (i.e. when a decision has been made to transfuse one of the units), the time must be documented on the tag attached to the transport box (Appendix 4).

11.12.6 All unused Blood Components must be returned to Blood Bank in a timely manner in order to avoid wastage of the units.

11.13 Administration of Blood Components in an emergency

If there are any interruptions during this pre-administration checking procedure, the entire process should be restarted from the beginning.

a. Prepare equipment as per the WHSCT Aseptic Non-Touch Technique Guidelines.
b. Staff participating in 'Administration of a Blood Component' must have valid Haemovigilance training and Competency 4 assessment (due every three years).
c. Where a clinical area has approved a 'single person pre-administration checking' procedure, one qualified staff member takes sole responsibility for the bedside check, completing relevant blood transfusion documentation and actual commencement of the blood component transfusion.
d. If 'single person pre-administration checking' has not been approved in the clinical area, the bedside check must be performed by two qualified members of staff. This process must be undertaken independently.
e. The pre-administration check must always be conducted beside the patient[1].
f. In situations where multiple blood components have been transfused during *emergency treatment or during a surgical procedure,* every effort must be made to monitor vital signs ((i.e. heart rate, temperature, blood pressure and respiratory rate) during the transfusions and to record a list of the Blood Components transfused[4].

11.13.1 When a decision has been made to transfuse a blood component that has been delivered in a transport box, record date and time when the seal is broken on the tag attached to the transport box (Appendix 4).

11.13.2 Check the Blood Component expiry date. The unit must be completed before midnight on the expiry date (if not completed at this point the transfusion of the expired unit must be stopped).

11.13.3 Check integrity of the unit (signs of discolouration, leaks or clumping) (Appendix 5).

11.13.4 Check the Blood Group is compatible with the patient's Blood Group (Appendix 6).

11.13.5 If the Emergency Uncrossmatched O RhD Negative units, not specifically labelled for the patient, are to be administered, a pre-administration check must still be performed to ensure that the correct Blood Component (unit donation number, blood group and expiry date) is transfused to the correct patient.

11.13.6 Check the Unit Number on the Blood Component with the unit number on the Blood Traceability Record and the tag attached to the unit to ensure they all match.

11.13.7 If there are any discrepancies found, the Blood Component should not be transfused and advice must be sought from the Blood Bank.

11.13.8 Prime the Blood Component administration giving set with the Blood Component. A Blood Component administration giving set must be used at all times to ensure that the Blood Component is filtered prior to administration.

11.13.9 A Neonatal Syringe Set (Appendix 7) is available for administering paedipacks via a syringe pump; a Paediatric Blood Component administration giving set is available if administering paedipacks via a volumetric pump.

11.13.10 As all Blood Components must be administered via a Blood Component administration giving set, if administering small amounts to neonates or infants, or administering via the intra-osseous route, a three way tap can be attached to the end of the Blood Component administration giving set and the required amount of Blood Component can then be drawn up into a syringe.

11.13.11 Care must be taken when inserting the Blood Component administration giving set into the port of the Blood Component (to avoid puncture to the pack or a sharps injury).

11.13.12 The Blood Component must be erected by a staff member involved in the pre-administration bedside check.

11.13.13 If using a gravity or electronic infusion device, set up the Blood Component transfusion via the device, checking the device and settings prior to use to ensure it is in working order.

11.13.14 Set the desired transfusion rate as authorised by the member of Medical Staff or a 'Non-Medical Authoriser' (who has completed training on 'Non-Medical Authorisation of Blood Components'). For patients receiving a volume based on body weight, extra precaution should be taken to ensure the correct rate is set on the infusion pump.

11.13.15 If any amount of the Emergency Uncrossmatched O RhD Negative Red Cells is transfused to a patient, record the patient identification details (first name, surname, date of birth and unique identification number), details of staff administering the unit and date and time the unit was transfused on the Blood Traceability Record prior to returning the Blood Traceability Record to Blood Bank.

11.13.16 A record of the unit numbers of all Emergency Uncrossmatched O RhD Negative Red Cells administered must be available. Peel off the barcode unit number label attached to the tag on the unit of Emergency Uncrossmatched O RhD Negative Red Cells and place in the patient case notes (e.g. in the Blood Component Transfusion Record).

11.13.17 For all other Blood Components administered during an emergency, record the unit numbers in the patient case notes (e.g. on the Blood Component Transfusion Record).

11.14 Return of unused Emergency Uncrossmatched O RhD Negative Red Cells

Once the transport box containing the Emergency Uncrossmatched O RhD Negative Red Cells has been removed from the Blood Issue Fridge, it must not be placed back into the Blood Issue Fridge regardless if units are used or not used:-

a. **Altnagelvin Hospital / SWAH** – Inform Porter to return transport box with unused unit(s) to Blood Bank as soon as possible. The unused unit(s) and transport box must be handed directly to a member of staff in Blood Bank (i.e. must never be left unattended).
b. **OH&PCC** – contact SWAH Blood Bank for advice on how to return the transport box and unused unit(s) to SWAH Blood Bank.

11.15 Return of other unused Blood Components issued in an emergency

Inform Porter to return unused unit(s) to Blood Bank as soon as possible. The unused unit(s) must be handed directly to a member of staff in Blood Bank (i.e. must never be left unattended).

12.0 PATIENT INFORMATION

12.1 Although gaining written consent for blood transfusion (Appendix 8) is not a legal requirement in the UK, there is a responsibility to ensure that the patient or parent / guardian receives adequate information regarding the transfusion Patient Information Leaflet - Will I Need a Blood Transfusion

12.2 In planned circumstances, patients and or parent / guardian should be provided with advance information and an opportunity to ask questions about the risks and benefits of transfusion. They should also be informed about any suitable and available transfusion alternatives[4].

12.3 Complete the relevant section on the Blood Component Transfusion Record.

12.4 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.

12.5 Provide a Patient Information Leaflet - Will I Need a Blood Transfusion (copies are available in the clinical area and via the WHSCT Intranet).

12.6 Any patient is within their rights to refuse a Blood Component transfusion for any or no given reason. The beliefs of any patients who decline transfusion should be acknowledged and respected.

12.7 For patients who are not willing to consent to transfusion, such as Jehovah's Witnesses, adhere to the Northern Ireland Pathway for the Management of Adult Patients who decline Specified Blood Components or Blood Products.

12.8 Consent issues should not delay necessary transfusion in an emergency situation.

12.9 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.

13.0 PRE-TRANSFUSION TESTING

13.1 Pre-transfusion testing for Neonates and Infants less than 4 months

13.1.1 A Group and Direct Antiglobulin Test (Group and Coombs Test) should be undertaken after delivery from the neonate or infant where there is a risk of HDN and for the neonate or infant that may require a Blood Component transfusion.

13.1.2 Small volume transfusions can be given repeatedly over the first 4 months of life without any further serological testing.

13.1.3 Neonates and infants under 4 months of age rarely produce atypical red cell antibodies. If atypical antibodies are detected during testing, samples from mother (if possible*) should be obtained to determine ABO and RhD type. *If the neonate is transferred from another hospital without the mother, a Group and Coombs sample should be taken from the neonate so that if Red Cells are required, Group Specific blood could be issued.

13.1.4 A positive DAT on the neonate or infant's Red Cells or an atypical red cell antibody in the maternal serum suggests possible HDN. In such cases, special serological procedures may be necessary to allow selection of appropriate Blood Components. Blood Bank will advise the clinical area of sample requirements as further samples might be required to be sent to NIBTS.

13.2 Pre-transfusion testing for Infants greater than 4 months, Children and Adults

13.2.1 Group and Screen (or 'Group and Hold' or 'Group and Save')

a. 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 cause a transfusion reaction.
b. This procedure takes approximately 15 minutes to perform following receipt of an accurately labelled sample.

13.2.2 Group and Crossmatch

a. The patient's blood is tested to determine the ABO and RhD type, to detect red cell antibodies that could cause a transfusion reaction and to confirm compatibility with each of the units of Red Cells to be transfused.
b. This procedure takes approximately 45 minutes to perform following receipt of an accurately labelled sample. This may take longer if the patient has atypical antibodies (section 13.3) or if the patient does not have an existing (historic) blood group (section 13.4.2).

13.3 Patient with Atypical Antibodies

13.3.1 If, during antibody screening, a patient is found to have antibodies present, a process of antibody identification will be carried out.

13.3.2 Further samples might be required to be sent to NIBTS for investigation.

13.3.3 Blood Bank should be informed of any patients with known antibodies who may require a Blood Component transfusion (including patients who are going to theatre even if the usual MSBOS is Group and Screen only). If possible, inform Blood Bank 48 hours prior to date of surgery.

13.3.4 The Blood Bank staff will advise on the availability and time required to provide compatible blood should it be required.

13.4 Confirmation Sample (Appendix 3)

13.4.1 A Confirmation Sample is in place to reduce the risk of wrong blood in tube errors (an error that occurs where identification information, label and request form, belong to one patient but the blood in the tube belongs to another patient).

13.4.2 Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories states that "Unless secure electronic patient identification systems are in place, a second sample should be requested for confirmation of the ABO group of a first time patient prior to transfusion, where this does not impede the delivery of urgent Red Cells or other components"[20].

13.4.3 If a patient does not have an existing (historic) blood group and requires a Blood Component transfusion, Blood Bank will inform the clinical area that a Confirmation Sample is required to confirm the ABO and RhD group for the patient.

13.4.4 Blood Bank will commence the crossmatch procedure but the unit will not be issued from Blood Bank until the blood group has been confirmed with the Confirmation Sample.

13.5 Sample Validity

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.

13.5.1 If a patient has had a transfusion or has been pregnant in the last 3 months, a repeat sample is required within 72 hours of the original sample.

13.5.2 If a patient has not received a transfusion or has not been pregnant in the last 3 months; the sample is valid for 7 days.

14.0 OBTAINING A PRE-TRANSFUSION SAMPLE

If there are any interruptions during this procedure, the entire process should be restarted from the beginning.

a. Adhere to WHSCT Standard Operating Procedure on Venous Blood Collection and if sampling neonates, WHSCT Guideline for venepuncture in neonates.
b. Staff responsible for obtaining a pre-transfusion sample must be competent at venepuncture, have valid Haemovigilance training (due every three years) and valid Competency 1 assessment 'Obtaining a pre-transfusion sample' (due every three years).
c. In NI, new-born bloodspot screening is offered which includes screening for Sickle Cell Disorders. If a neonate requires a transfusion of Red Cells before Day 5, he/she must have a 'Blood Spot' taken prior to administering a Blood Component transfusion.

14.1 Completion of the NI Hospital Transfusion Request Form

14.1.1 Information required to be completed accurately and legibly (an addressograph label can be used) on the request form:

a. Unique Identification Number.
b. Patient's surname.
c. Patient's official first name.
d. Date of Birth.
e. Gender.
f. Consultant
g. Hospital.
h. Clinical area.
i. Transfusion History & Test Request (ask patient, check case notes, check Laboratory system).
   - The patient may have developed antibodies as a result of a 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'.
   - Previous Reactions – ascertain if the patient has had a previous reaction to a Blood Component transfusion. If 'Yes' update Transfusion Request Form accordingly.
j. For neonates and infants less than 4 months old, record the mother's identification details on the 'Laboratory Comments' section on the Form. During the first 4 months of life, ABO antigens may be poorly expressed on Red Cells and the corresponding ABO antibodies may not have yet developed. Antibodies present in a neonate or infant less than 4 months old will be maternal in origin. Red Cells selected must be compatible with the maternal and infant group and negative for maternal antibodies.

k. Test Request.
l. Reason for Group and Screen.
m. Date and time sample taken.
n. Printed name, signature and staff group of staff member who took the sample confirming that the patient identification details correspond to the details of the patient, the patient identification band, the NI Hospital Transfusion Request Form and the sample tube.
o. Record professional registration number if applicable.

14.1.2 If a Group and Crossmatch is required the following information should be completed: -

a. Number of units (or amount in mls where applicable), time and date required (if it is an emergency transfusion, ensure phone call to Blood Bank).
b. Adhere to MSBOS when Red Cells are ordered for surgery.
c. Any Special Requirements (e.g. Irradiated, CMV Negative).
d. Location for delivery of Blood Components.
e. Indication for Red Cell transfusion or other Blood Component. Blood Bank has the discretion to request the clinician to discuss Blood Component requirements with a Consultant Haematologist prior to issue.
f. Date and result of most recent Haemoglobin result (if applicable).
g. Printed name, signature, staff group and professional registration number of staff member requesting the Blood Components.

14.1.3 If a valid pre-transfusion sample is available in Blood Bank (section 14.0) and a Blood Component is required, telephone Blood Bank with relevant details (as indicated below [a-e]) or send an accurately completed NI Hospital Transfusion Request Form to Blood Bank with the following information:-

a. Patient identification details (official first name, surname, date of birth, unique identification number).
b. Location of patient.
c. Number and type of Blood Components required (including any special requirements).
d. The indication for the request. Blood Bank staff have been empowered to question requests to ensure patients do not receive unnecessary transfusions.
e. The date and time the Blood Component is required.
f. Sign and date the bottom of the NI Hospital Transfusion Request Form.

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

14.2 Obtaining a Pre-transfusion Sample

The collection of the blood sample from the patient and subsequent completion of details on the sample and form must be performed as one continuous, uninterrupted event, involving one patient and one trained, competent and authorised member of staff at the patient's bedside[1].

14.2.1 Check expiry date of sample bottle.
14.2.2 Positively identify the patient (section 7.0).
14.2.3 If any discrepancies with the patient identification details – resolve the discrepancy. Do not proceed until the discrepancy is resolved.
14.2.4 For neonate and infant less than 4 months old, use a paediatric sample bottle.
14.2.5 For anyone greater than 4 months old, use a 6 ml pink topped EDTA blood transfusion sample bottle. At least 2ml of blood in a 6ml EDTA blood transfusion sample bottle is required for infants greater than 4 months old.
14.2.6 Handwrite the details on the sample tube beside the patient immediately after taking the sample taking the details from the patient identification band.
14.2.7 Label the sample tube with the patient's official first name, surname, date of birth, unique identification number, clinical area, gender and then sign, date and time.
14.2.8 At the bedside, make a final check that the details on the patient identification band correspond with the patient identification details on the NI Hospital Transfusion Request Form and sample tube.
14.2.9 Print name, sign, date and time the NI Hospital Transfusion Request Form.
14.2.10 Record in the patient's case notes why, when and who took the sample.
14.2.11 Take the sample to a designated collection point in the Clinical area or use the vacuum transfer system.
14.2.12 In an emergency, urgent samples must be hand delivered.

14.3 Important points relating to obtaining a Pre-transfusion Sample

14.3.1 **All** patients must wear a patient identification band when they require a sample to be taken for pre-transfusion testing.
14.3.2 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.
14.3.3 An addressograph label can be used on the NI Hospital Transfusion Request Form. For patients with long names that do not fully print on the addressograph label, the missing part must be added by hand onto the label.
14.3.4 Samples for pre-transfusion 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.
14.3.5 Sample tube should be correctly filled (at least 2mls for adult samples).
14.3.6 Sample tubes **must not** be pre-labelled.
14.3.7 All details **must** be handwritten legibly on the sample tube – addressograph labels or handwritten sticky labels must not be used on the sample tube.
14.3.8 The sample tube must be handwritten by the person taking the sample immediately after the sample has been taken and beside the patient.

14.3.9 It is essential to use the patient's 'official' name and to spell the patient's name correctly and consistently.

14.3.10 Avoid using roller ball or fountain pen when recording details on sample tube.

14.3.11 Ensure that sample cap is securely in place before placing sample in a specimen bag.

14.3.12 After the sample is taken, the blood should be mixed gently in the tube.

14.3.13 Wherever possible, if the neonate or infant under 4 months requires a blood component transfusion, samples from both mother and neonate or infant should be obtained for initial ABO and RhD group determination.

14.3.14 If a patient is known or suspected to have a Hazard Group 3 pathogen, Hazard Group 3 stickers should be affixed to the NI Hospital Transfusion Request Form before the sample is taken. Hazard Group 3 samples cannot be sent to Blood Bank in the vacuum transfer system. Blood Bank should be informed and the sample should be hand delivered to the Blood Bank.

14.3.15 In an emergency situation - inform Blood Bank; samples should be hand delivered to the Blood Bank and the staff member delivering the sample should be aware of the urgency of the situation.

14.3.16 Samples that will be rejected and discarded (even in an emergency situation) – under-filled samples; haemolysed samples; expired bottles; inappropriate sample bottle for infant greater than 4 months of age; incorrectly labelled samples and/or forms.

14.3.17 Mandatory information required on the pre-transfusion sample and form (Table 19):

TABLE 19

Details	NI Hospital Transfusion Request Form	Sample
Unique Identification Number	Mandatory	Mandatory
Official first name	Mandatory	Mandatory
Surname	Mandatory	Mandatory
Date of birth	Mandatory	Mandatory
Gender	Mandatory	Mandatory
Date of sample	Mandatory	Mandatory
Time of sample	Mandatory	Mandatory
Sample taken by	Mandatory	Mandatory
If requesting Blood Components		
Number of Blood Components	Mandatory	N/A
Special Requirements	Mandatory	N/A
Blood Components requested by	Mandatory	N/A

15.0 WRITTEN ORDER FOR AUTHORISING A BLOOD COMPONENT TRANSFUSION

15.1 The BSQR define Blood Components as a therapeutic constituent of blood (Red Cells, platelets, FFP, cryoprecipitate and granulocytes) whereas blood products are derived from whole blood or plasma (e.g. solvent detergent (SD)-FFP, albumin, anti-D immunoglobulin) and are classed as medicinal products[5]. Blood Components are excluded from the legal definition of medicinal products[6] and must be 'authorised' rather than 'prescribed'[7].

15.2 Blood Components should only be authorised (providing a written instruction) by an appropriately trained, competent and locally designated and approved registered health care professional. This group of staff will be Medical Staff or a 'Non-Medical Authoriser' who has completed training on 'Non-Medical Authorisation of Blood Components'. The staff member authorising the Blood Component transfusion must also have valid Haemovigilance training e.g. completion of elearning module "Blood Components and indications for use" (due every 3 years).

15.3 If there is no clear clinical indication to transfuse overnight, consideration should be given to deferral of transfusion to the following day[1].

15.4 Transfusions should be given with the same attention to patient observations whatever the time of night or day[1]. Transfusions at night must only proceed where there is a clear clinical indication and where there are sufficient staff to permit safe transfusion, including all required patient observations.

15.5 A formal pre-transfusion risk assessment for TACO should be performed whenever possible as TACO is the most commonly reported cause of transfusion-related death and major morbidity[16].

15.6 Where a TACO checklist is available on the Blood Component Transfusion Record, this must be completed prior to authorising a Blood Component transfusion. If the patient is identified as being at risk of TACO, consideration must be given to the volume of Blood Component to be transfused, the rate of the transfusion, deciding whether diuretics should be prescribed and monitoring of vital signs during the transfusion[1].

15.7 The Blood Component Transfusion Record is used for authorising (providing a written instruction) all Blood Components in a non-emergency situation.

15.8 Written authorisation must be completed accurately to include:-

a. Patient identification details (official first name, surname, date of birth, unique identification number and gender).
b. Clinical area.
c. Consultant.
d. Details that information discussed with Patient / Guardian about the need for a Blood Component transfusion.
e. A TACO checklist (if available on the Blood Component Transfusion Record).
f. Date for transfusion.
g. Type of Blood Component.
h. Recent relevant blood results.

i. Reason for transfusion.
j. Special Requirements (e.g. CMV negative or Irradiated Units).
k. The clinical indication for a diuretic should be assessed for each patient.
l. Other Instructions.
m. Duration of transfusion (Table 20) – do not provide a time range e.g. 2 to 3 hours.
n. For adult patients with low body weight (< 50kgs) and for neonates, infants and children, state volume to be transfused (mls) and rate of transfusion (mls/hr).
o. Request the actual amount (mls) required plus an allowance for priming of the Blood Component administration giving set (see information on administration giving set packet for priming volume). If the volume calculated for infants and children exceed the accepted adult therapeutic dose, discuss with Blood Bank.
p. Previous transfusion reaction (if section available on the Blood Component Transfusion Record).
q. Confirmation that Patient Information section completed (if section available on the Blood Component Transfusion Record).
r. Print Staff Name, signature, professional registration number of staff member authorising (providing written instruction) the Blood Component transfusion and date and time (if sections available on the Blood Component Transfusion Record).

TABLE 20

DURATION OF TRANSFUSION	Adults	Neonates[17]	Infants & Children (from 1 year of age)[17]
Red Cells	Routine transfusion:- • In patient not at risk of TACO: one unit over 90 to 120 minutes[1]. • For the patient at risk of TACO: one unit over 3 ½ hours.	5ml/kg/hr	5 ml/kg/hr (usual maximum rate: 150 ml/hr).
Platelets	Over 30 minutes	10–20 ml/kg/hr	10–20 ml/kg/hr
FFP	Over 30 minutes	10–20 ml/kg/hr	10–20 ml/kg/hr
Cryoprecipitate	Over 30 minutes	10–20 ml/kg/hr	10–20 ml/kg/hr

16.0 ORGANISING DELIVERY / RECEIPT OF A BLOOD COMPONENT

If there are any interruptions during this procedure, the entire process should be restarted from the beginning.

- Staff responsible for organising delivery / receipt of a Blood Component must have valid Haemovigilance training (due every three years) and valid Competency 2 assessment 'Organising delivery / receipt of a Blood Component' (due every three years).

16.1 Prior to organising delivery / receipt of a Blood Component for transfusion ensure that: -

a. The Blood Component is ready for collection. In non-emergency situations, check the Laboratory System.
b. The patient is available (to avoid delays once the Blood Component has been removed from controlled temperature storage).
c. The patient has a patient identification band in situ.
d. The patient has patent venous access.
e. The Blood Component Transfusion Record has been completed regarding patient information for a Blood Component transfusion, Blood Component required, duration of transfusion etc. (section 15.8).
f. The patient has had baseline observations (temperature, pulse, respirations and blood pressure) taken and recorded (on Early Warning Score Chart or Trust approved alternative) no greater than 60 minutes prior to commencement of transfusion. If these are not within normal limits for the patient, medical staff must be informed prior to requesting the Blood Component.
g. There is sufficient appropriately trained and competent staff available for the duration of the transfusion[1].
h. Relevant equipment is available (e.g. Blood Component administration giving set).

16.2 Accurately complete a Blood Collection Form.

16.3 An addressograph label can be used on the Blood Collection Form. For patients with long names that do not fully print on the addressograph label, the missing part must be added by hand onto the label during the patient identification process.

16.4 Undertake positive patient identification (section 7.0) confirming that the patient identification details correspond with the patient, identification band and the Blood Collection Form.

16.5 Information required to be completed accurately and legibly (an addressograph label can be used) on the Blood Collection Form:-

a. Unique Identification Number.
b. Patient's official first name.
c. Patient's surname.
d. Date of Birth.
e. Gender.
f. Clinical area.
g. Consultant.
h. Blood Component required indicating any Special Requirements, as indicated on the Blood Component Transfusion Record.
i. If the Blood Component transfusion is taking place in the hospital setting and more than one blood component is required for collection at the same time (e.g. emergency situation / plasma exchange), indicate the number of units required on the form and discuss request with Blood Bank.
j. Details of staff member completing the form (staff name, signature, staff group, clinical area, date and time).

16.6 Identify and ask the appropriate member of staff (who has valid Haemovigilance training and competency assessment to be involved in Blood Component collection) to collect the Blood Component:-

a. **Altnagelvin Hospital** – Porter.
b. **Satellite Blood Fridge, Recovery, Main Theatres, Altnagelvin Hospital** - Member of Theatre Nursing Staff / Porter.
c. **Renal Unit, Altnagelvin Hospital** - Support Services Assistant.
d. **OH&PCC** - Member of Nursing Staff / Healthcare Assistant / Renal Dialysis Assistant.
e. **SWAH** – Porter.
f. **Rapid Response Nursing / Acute Care at Home Teams** – Member of Nursing Staff / Healthcare Assistant.

16.7 Ensure the accurately completed Blood Collection Form is delivered or brought to the relevant Blood Collection area (as per details on the Blood Collection Form).

16.8 Ensure that the member of staff is aware of the exact location of where the Blood Component is to be collected from.

16.9 In the event of failure of the vacuum transfer system and the Blood Component is required in an emergency situation:-

a. Phone Blood Bank (09:00hrs – 17:00hrs Monday to Friday; or bleep BMS on call out of hours).
b. Inform staff member in Blood Bank of the patient identification details (official first name, surname, date of birth, unique identification number and gender), the Blood Component required and the clinical area.
c. Out of hours inform the Porter (via Switchboard emergency number 6000) to collect the Blood Component from the Blood Bank.

17.0 COLLECTING A BLOOD COMPONENT FOR TRANSFUSION

If there are any interruptions during this procedure, the entire process should be restarted from the beginning.

a. Staff responsible for collecting a Blood Component must have completed Haemovigilance training on 'Blood Collection' (due every two years) and have valid Competency 3 assessment 'Collecting a Blood Component for transfusion' (due every three years).
b. If there are any discrepancies during the blood collection process, Blood Bank must be informed and the Blood Component must not be taken to the clinical area until there has been an investigation and any discrepancies resolved.

17.1 Collecting Emergency Uncrossmatched O RhD Negative Red Cells

Section 11.9.

17.2 Collecting Red Cells or FFP from the Blood Collection Area

17.2.1 The staff member collecting the Blood Component must have an accurately completed (section 16.3) Blood Collection Form.

17.2.2 Ensure the correct Blood Component is removed as indicated on the Blood Collection Form.

17.2.3 Where more than one unit is in the Blood Issue Fridge for the same patient, select the unit that has the Compatibility Report if available.

17.2.4 Select and remove the unit that has the patient identification details (first name, surname, date of birth and unique identification number) on the compatibility tag attached to the Blood Component that corresponds with the patient identification details on the Blood Collection Form.

17.2.5 The patient identification details on the Blood Traceability Record and the Compatibility Form (if available) must also match the patient identification details on the Blood Collection Form.

17.2.6 When satisfied that the 'Right Blood' for the 'Right Patient' has been removed, as indicated on the Blood Collection Form, the following details must be documented on the Blood Bank register beside the corresponding Blood Component unit number (not applicable for Satellite Blood Fridge, Theatres, Altnagelvin Hospital): -

a. Date Blood Component removed.
b. Time Blood Component removed.
c. Initials of staff member removing the Blood Component.

17.2.7 Print name and record date and time Blood Component removed on the Blood Traceability Record which should correspond with the time recorded on the Blood Bank register (Blood Bank register not applicable for Satellite Blood Fridge, Theatres, Altnagelvin Hospital).

17.2.8 Place the Blood Traceability Record and the Compatibility Report (if available) into the clear bag along with the Blood Component.

17.2.9 Altnagelvin Hospital and SWAH, remove a cool pack from the Blood Issue Fridge and place in transport box with unit of Red Cells or FFP.

17.2.10 This process must be completed for each Blood Component collected.

17.2.11 If the transfusion is being undertaken by the Rapid Response Nursing or Acute Care at Home Teams (outside of Altnagelvin, OH&PCC or SWAH hospital setting) more than one Blood Component may be collected.

17.2.12 If an emergency situation inform Blood Bank if more than one unit is required to be collected (section 11.11).

17.2.13 Leave the Blood Collection Form in the relevant location in the Blood Collection Area.

17.2.14 Take the Blood Component immediately to the requesting clinical area (as indicated on the Blood Collection Form) and hand the Blood Component to a qualified member of staff (or in Theatres to a Theatre Orderly or qualified member of staff).

17.2.15 Wait for the qualified member of staff to confirm that the correct Blood Component for the correct patient has been delivered to the clinical area and has completed his/her details on the Blood Traceability Record in the section 'Receipt of unit in clinical area'.

17.3 Collecting other Blood Components from the Blood Collection Area

17.3.1 Platelets and Cryoprecipitate will be handed to the staff member in the clinical area by a member of staff in Blood Bank.

17.3.2 The staff member collecting the Blood Component must have an accurately completed (section 16.3) Blood Collection Form to give to the member of staff in Blood Bank.

17.3.3 Take the Blood Component immediately to the requesting clinical area (as indicated on the Blood Collection Form) and hand the Blood Component to a qualified member of staff (or in Theatres to a Theatre Orderly or qualified member of staff).

17.3.4 Wait for the qualified member of staff to confirm that the correct Blood Component for the correct patient has been delivered to the clinical area and has completed his/her details on the Blood Traceability Record in the section 'Receipt of unit in clinical area'.

17.4 Additional information on collection of Blood Components.

17.4.1 If removing Red Cells or FFP from the Blood Issue Fridge, ensure that the door is closed properly after removal of the Blood Component.

17.4.2 Blood Components must never be left unattended after removal from the Blood Collection Area.

17.4.3 Red Cells and FFP must only be transported in boxes validated for that purpose and must never be stored in Domestic, Pharmacy or Ward Fridge.

17.4.4 **Altnagelvin Hospital** (excluding the Satellite Blood Fridge, Theatres) and **SWAH** - Monday to Friday (09.00hrs to 17.00hrs.) excluding Bank Holidays, the 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 his/her details on the Blood Traceability Record and the BMS completes his/her details on the Blood Bank register.

17.4.5 **Altnagelvin Hospital** (excluding the Satellite Blood Fridge, Theatres) and **SWAH** – out of hours Monday to Friday (17.00hrs to 09.00hrs.) and Bank Holidays, the Clinical Area inform the Porters via Porterweb (or Support Services Assistant, Renal Unit) that a Blood Component is required to be delivered to a clinical area and provides an accurately completed Blood Collection Form. The Porter (or Support Services Assistant, Renal Unit) ensures the correct component is removed and completes his/her details on the Blood Traceability Record and the Blood Bank register.

17.4.6 To access the Satellite Blood Fridge, Recovery Area, Main Theatres, Altnagelvin if no staff available in the Recovery Area, Bleep Theatre Nurse 8211.

17.4.7 **Altnagelvin Hospital** (Satellite Blood Fridge, Theatres) or **OH&PCC** - when collecting Red Cells from the Blood Issue Fridge, complete the information on the back of the Blood Traceability Record (i.e. name of staff member, date and time of removal).

18.0 RETURNING BLOOD COMPONENTS

a. Only Blood Components that are unused and have not had a blood administration giving set attached can be returned to Blood Bank (unless the patient has an adverse reaction or event).
b. Only staff who have completed Haemovigilance training on 'Blood Collection' (due every two years) and have valid Competency 3 assessment 'Collecting a Blood Component for transfusion' (due every three years) can partake in returning unused Blood Components to the Blood Bank or the Blood Issue Fridge.

18.1 Return of Emergency Uncrossmatched O RhD Negative Red Cells

Section 11.13.

18.2 Return of other unused Blood Components

18.2.1 If a Blood Component has been damaged in the clinical area (e.g. accidental puncture of pack with Blood Component administration giving set), do not return to Blood Bank:-

a. Dispose of unit in the clinical area.
b. Inform Blood Bank of the incident indicating if any of the unit was transfused.
c. Record on the Blood Traceability Record if the patient received any of the transfusion prior to sending the Blood Traceability Record back to Blood Bank. *If the patient received any of the unit, Blood Bank will update Blood Bank records that the unit was given to the patient (regardless of amount transfused); if the patient did not receive any of the transfusion, Blood Bank will update Blood Bank records that the unit was wasted*.
d. Document details of the incident as well as volume administered in the patient case notes.

18.2.2 Returning a single unit of unused crossmatched Red Cells:-

a. Can be returned to a Blood Issue Fridge if returned within 30 minutes of the time removed from controlled temperature storage.
b. The following details must be documented in the Blood Bank register beside the unit number being returned (not applicable for Satellite Blood Fridge, Theatres, Altnagelvin Hospital): -
   - Date Blood Component returned.
   - Time Blood Component returned.
   - Initials of staff member returning the unit of Red Cells.
c. Print name and record date and time Blood Component returned on the Blood Traceability Record. **Altnagelvin Hospital** (Satellite Blood Fridge, Theatres) and **OH&PCC Hospital** – complete information on the back of the Blood Traceability Record.
d. Place unit in Blood Issue Fridge. If the unit has a Compatibility Report available, place this unit at the front of the other units if there is more than one unit available for the same patient.

e. Inform Blood Bank that an unused unit was returned to the Blood Issue Fridge.
f. Rapid Response Nursing or Acute Care at Home Teams - inform Blood Bank in Altnagelvin Hospital or SWAH of any unused units and return as advised by Blood Bank.
g. If the unit of Red Cells is returned greater than 30 minutes after time of removal from controlled temperature storage, do not place into the Blood Issue Fridge. Arrange for return of the unused unit to Blood Bank where Blood Bank staff will assess viability of unit and complete documentation indicating fate of unit.
h. **OH&PCC** – complete information on the back of the Blood Traceability Record and place unused unit in the quarantine drawer of the Blood Issue Fridge. Contact Blood Bank, Altnagelvin Hospital to arrange return of unused unit.

18.2.3 If returning unused Group Specific Red Cells, FFP, Platelets or Cryoprecipitate or more than one unit of crossmatched Red Cells:-

a. The staff member returning unused unit(s) must hand the unused unit(s) directly to a member of staff in Blood Bank (i.e. must never be left unattended).
b. **OH&PCC** – contact Blood Bank, Altnagelvin Hospital to arrange return of unused unit(s).

18.2.4 Return transport boxes directly to a member of staff in Blood Bank (as there may be unused components remaining in the box).

19.0 PREPARING AND ADMINISTERING A TRANSFUSION OF A BLOOD COMPONENT

If there are any interruptions during this pre-administration checking procedure, the entire process should be restarted from the beginning.

a. Prepare equipment as per the WHSCT ANTT guidelines.
b. Staff participating in 'Administration of a Blood Component' must have valid Haemovigilance training and Competency 4 assessment (due every three years).
c. Where a clinical area has approved a 'single person pre-administration checking' procedure, one qualified staff member takes sole responsibility for the bedside check, completing relevant blood transfusion documentation and actual commencement of the blood component transfusion.
d. If 'single person pre-administration checking' has not been approved in the clinical area, the bedside check must be performed by two qualified members of staff. This process must be undertaken independently.
e. The pre-administration check must always be conducted beside the patient[1].
f. If the qualified member of staff is unsure that the Blood Component issued is correct (e.g. an unexplained difference between the blood groups in the donor and recipient or whether specific requirements have been met), contact Blood Bank for verification before starting the transfusion.

g. If there are any discrepancies during the checking process, Blood Bank must be informed and the Blood Component must not be transfused until there has been an investigation and any discrepancies resolved. Document any issues and actions taken in the patient's case notes.
h. The practice of priming or flushing administration sets used for the transfusion of Blood Components with 0.9% sodium chloride is not evidence-based and is not necessary[1]. Prime the Blood Component administration giving set with the Blood Component.

19.1 Technical aspects of Blood Component administration

Administration Equipment

19.1.1 Blood Components can be administered through peripheral intravenous cannulae or most central venous access devices (according to manufacturer's specifications). Where considered clinically necessary, Blood Components may also be administered via the intraosseous route[1].

19.1.2 The size of the peripheral cannula depends on the size and integrity of the vein and the speed at which the Blood Component is to be transfused. PICC lines with narrow lumen diameter may lead to slower flow rates[1].

19.1.3 All Blood Components should be administered through a CE-marked transfusion set with an integral mesh filter. The administration set should be changed at least every 12 hours or in accordance with the manufacturer's instructions. Red Cells and FFP may be transfused using the same administration set. A new administration set should be used to transfuse platelets, cryoprecipitate or if another infusion is to continue after the transfusion[1].

19.1.4 All Blood Components must be administered via a Blood Component administration giving set (even in an emergency situation).

19.1.5 A Neonatal Syringe Set (Appendix 7) is available for administering paedipacks via a syringe driver; a Paediatric Blood Component administration giving set is available if administering paedipacks via a volumetric pump.

19.1.6 Either gravity or electronic infusion devices may be used for the administration of Blood Components in accordance with manufacturer's instructions. The volume delivered should be monitored regularly throughout the infusion to ensure that the expected volume is delivered at the required rate[1].

19.1.7 Rapid infusion devices may be used when large volumes have to be infused quickly, as in massive haemorrhage. External pressure devices should only be used in an emergency situation together with a large gauge venous access cannula or device and should be certified by the manufacturer for use in rapid transfusion of Blood Components and used according to manufacturers' instructions[1].

19.1.8 Blood Warmers[1] should be used in the transfusion of Red Cells to patients with:-

- Clinically significant cold agglutinins.
- In the management of major haemorrhage.
- In adults undergoing elective or emergency surgery.
- Neonatal Exchange Blood Transfusions – only appropriate if the transfusion is given at a constant rate (warming is not suited to the intermittent bolus nature of a single vessel Exchange Blood Transfusion where the 'push – pull' cycle method is used)[17].
- Each patient should be individually assessed, and consideration should be given when rapidly transfusing large volumes to neonates, infants, children, elderly patients, and patients susceptible to cardiac dysfunction. There is no evidence to suggest that transfusion of platelets or FFP through a blood warmer is harmful. Equipment should be certified by the manufacturer for the warming of Blood Components and used according to manufacturers' instructions[1].

Co-administration of IV fluids and drugs with Blood Components

19.1.9 Co-administration of IV fluids and drugs with Blood Components – under no circumstances should drugs be directly added to a Blood Component bag. The addition of a drug to an IV line containing Blood Components raises concerns about compatibility of the drug and its carrier with the Blood Component and any preservatives or additives. It is therefore generally advised that no other IV fluids or drugs should be co-administered via an infusion line that is being used for a Blood Component or via a single lumen venous access device[1].

19.1.10 When multi-lumen central venous access devices are used, it is generally safe to co-administer other therapeutic solutions through a different lumen. Any other multi-lumen peripheral access devices or three-way tap devices need to be risk-assessed[1].

Patient requiring a Blood Component transfusion and to be transferred to another Clinical Area within the same Hospital

19.1.11 The patient should be stable from the blood transfusion perspective.

19.1.12 Do not stop the transfusion for the purpose of the transfer.

19.1.13 Do not transfer the patient until after the first 15 minutes of the transfusion.

19.1.14 Ensure the patient is escorted by a qualified member of staff who has valid Haemovigilance training and valid Competency 4 assessment 'Administration of a Blood Component'.

19.1.15 Ensure accurate information is provided on handover if a Blood Component transfusion is in progress (e.g. time started, duration of transfusion, if at risk of TACO, expected completion time as per details on the Blood Component Transfusion Record).

19.1.16 If Blood Components are transferred in a Transport Box, ensure storage conditions acceptable (Appendix 4) or contact Blood Bank for advice.

Issues with venous access

19.1.17 If a Blood Component transfusion has to be stopped when a cannula is tissued and the Blood Component administration giving set remains attached to the cannula:-

- Insert a new cannula.
- Following hand decontamination, directly attach the Blood Component administration giving set from the original cannula to the new cannula using ANTT.

19.1.18 If a Blood Component has to be stopped when a cannula has been dislodged (i.e. no longer attached to the patient):-

- Following hand decontamination, remove the venflon from the Blood Component administration giving set and attach a bung to the distal end of the giving set using ANTT.
- Insert a new cannula.
- Following hand decontamination, directly attach the Blood Component administration giving set to the new cannula using ANTT.

19.2 Information on Blood Component labels

19.2.1 Blood Components are usually issued by NIBTS with a primary label attached to the front of the unit detailing the unit number, volume, expiry date, blood group, Rh status and any special requirements (Appendix 9).

19.2.2 After the unit has been crossmatched (confirmed as compatible for the patient) Blood Bank will:-

a. Issue a Compatibility Report detailing the patient's Blood Group and Antibody Screen results with a list of the unit numbers of the Blood Components that have been crossmatched.
b. Attach a compatibility tag to each unit crossmatched with the donation unit details of the Blood Component and the patient's identification details.
c. Label a corresponding Blood Traceability Record for each unit crossmatched with the donation unit details of the Blood Component and the patient's identification details.

19.3 Administration of Emergency Uncrossmatched O RhD Negative Red Cells

Section 11.12.

19.4 Pre-administration checks prior to commencement of a Blood Component for transfusion

a. Evidence from SHOT shows that the bedside check performed at the point of transfusion is not always undertaken correctly and that this puts patients at risk of serious complications or death.
b. A confirmatory step must be in place where the individual performing the checks must sign to say that all steps have been followed[21]. Where a checklist has been incorporated into the Blood Component Transfusion Record, this must be completed prior to commencing a Blood Component transfusion.
c. Baseline observations must be recorded (no greater than 60 minutes) on Early Warning Score Chart or Trust approved alternative prior to the commencement of the Blood Component transfusion.

19.4.1 Check the Blood Component expiry date. The unit must be completed before midnight on the expiry date (if not completed at this point the transfusion of the expired unit must be stopped).

19.4.2 Check integrity of the unit (signs of discolouration, leaks or clumping) (Appendix 5).

19.4.3 Undertake positive patient identification (section 7.0) confirming that the patient identification details (official first name, surname and date of birth) provided by the patient (or relative / carer) corresponds with the identification band.

19.4.4 Ensure that the patient identification details on the patient identification band (official first name, surname, date of birth and unique identification number) corresponds to the patient identification details on the blood compatibility tag attached to the Blood Component unit (to ensure the 'Right Patient' receives the 'Right Blood') and on the Blood Component Transfusion Record.

19.4.5 Ensure that the patient identification details (official first name, surname, date of birth and unique identification number) on the patient identification band and the Blood Component details (unit number, expiry date, blood group and RhD status) on the Blood Component corresponds to the details on the Blood Traceability Record and Compatibility Report.

19.4.6 Check any special requirements contained in the Blood Component Transfusion Record corresponds with the special requirements indicated on the NIBTS Blood Component primary label.

19.4.7 Check the Blood Component Transfusion Record to ensure the blood component is correctly authorised (date for transfusion, Blood Component to be administered, duration of transfusion / volume and rate, authoriser details completed).

19.4.8 If there are any discrepancies found, the Blood Component should not be transfused and advice must be sought from the Blood Bank.

19.4.9 If no discrepancies are found during the bedside checks, all relevant documentation (Blood Component Transfusion Record; Blood Traceability Record; Compatibility Report and Blood Component compatibility tag attached to the Blood Component) must be completed – staff name(s), date and time that the bedside check was undertaken.

19.4.10 Complete all sections of the "Bedside Checklist" where available on the Blood Component Transfusion Record.

19.4.11 The Blood Component must be erected by a staff member involved in the pre-transfusion bedside check.

19.4.12 Prime the Blood Component administration giving set with the Blood Component.

19.4.13 Care must be taken when inserting the Blood Component administration giving set into the port of the Blood Component (to avoid puncture to the pack or a sharps injury).

19.4.14 Set up transfusion via gravity or electronic infusion device, checking the infusion device and settings prior to use to ensure the device is in working order.

19.4.15 Set the desired transfusion rate as authorised on the Blood Component Transfusion Record. For patients receiving a volume based on body weight, extra precaution should be taken to ensure the correct rate and volume is set on the infusion pump.

19.4.16 Record the following on the Blood Component Transfusion Record:-

a. Time of baseline observations.
b. Date commenced.
c. Time commenced (NB this is after the time the baselines observations were undertaken).
d. Blood Component Unit Number.

19.4.17 At the end of the Blood Component transfusion, record the volume of the Blood Component transfused on the Fluid Balance Chart (where applicable).

19.5 Additional information for Blood Component transfusions in Neonates and Infants

19.5.1 A Neonatal Syringe Set (Appendix 7) is available for administering paedipacks via a syringe driver; a Paediatric Blood Component administration giving set is available if administering paedipacks via a volumetric pump. No further additional filter is required.

19.5.2 The Neonatal Syringe Set and Paediatric Blood Component administration giving set should be CE-marked transfusion sets (including filter) and incorporate a system that allows the Blood Component bag to remain attached throughout the transfusion.

19.5.3 The transfer of patient identification details and Blood Component details to a syringe label is not acceptable practice due to the risk of transcription errors.

More than one paedipack required

19.5.4 Blood components from more than one paedipack should never be mixed in a syringe[3].

19.5.5 If using a syringe driver, use a new Neonatal Syringe Set for each paedipack administered.

19.5.6 Only one paedipack will be issued at one time from Blood Bank.

19.5.7 Care must be taken to ensure that only the required amount of the second Paedipack is administered (as per original volume authorised on the Blood Component Transfusion Record).

19.5.8 Where practical and a planned transfusion, if more than two paedipacks are required, Blood Bank will arrange for an adult pack from an accredited donor with relevant special requirements to be issued.

19.5.9 It is good practice to liaise with Blood Bank in order to ensure that donor exposure is minimised and that the volume authorised and requested from Blood Bank is not above the maximum normally authorised for an adult in a similar situation.

19.6 Monitoring of the patient during a Blood Component transfusion

19.6.1 Blood Component transfusions must only take place in locations where staff are trained to recognise and treat anaphylaxis.

19.6.1 Observations during a Blood Component administration must be recorded on the Early Warning Score Chart or Trust approved alternative.

19.6.2 As a minimum vital signs (heart rate, blood pressure, temperature, respiratory rate) are to be recorded before the start (no more than 60 minutes before transfusion commenced), 15 minutes after commencement and at the end of the transfusion.

19.6.3 Record the time of the 15 minute observations on the Blood Component Transfusion Record.

19.6.4 Further observations are at the discretion of the clinical area (dependent on clinical condition, level of consciousness, ability to communicate adverse effects etc.).

19.6.5 If patient is at risk of TACO, observations must be monitored and recorded every 30 minutes.

19.6.6 Additional observations, e.g. oxygen saturation, urine output and fluid balance, should be recorded if indicated by the patient's condition and particularly important for any patients identified as at risk of TACO.

19.6.7 Staff must be familiar with possible signs and symptoms of acute and delayed Blood Component transfusion reactions. Possible features of an acute transfusion reaction include fever, chills, rigors, tachycardia, hyper-or hypotension, collapse, flushing, urticaria, pain (bone, muscle, chest, abdominal), respiratory distress, nausea, general malaise (Appendix 10).

19.6.8 The patient should be visually observed throughout the transfusion to detect any change in their condition that may be due to a transfusion reaction and to check that the transfusion is progressing at the rate indicated on the Blood Component Transfusion Record.

19.6.9 If the Blood Component transfusion exceeds the duration or is transfused quicker than is indicated on the Blood Component Transfusion Record, inform the doctor. If the duration of a unit of Red Cell exceeds 4 hours from the time the unit was removed from controlled temperature storage, Blood Bank must be informed for further follow up by the Haemovigilance Practitioner.

19.6.10 Ensure the patient and/or carer has access to a call bell and inform the patient and/or carer of the importance of reporting any adverse effects (e.g. fever, chills, rigors, flushing, urticaria, pain (bone, muscle, chest, abdominal), respiratory distress, nausea, general malaise) whilst the transfusion is in progress and any time afterwards (transfusion reaction can occur up to 14 days post transfusion).

19.6.11 Special care should be taken in patients who are unable to communicate symptoms of a developing transfusion reaction (e.g. unconscious, confused or too young). In patients in whom reactions may be more subtle (e.g. neonates or infants) more frequent observations may be required[1]. Restlessness, crying, panic or unexpected lethargy may all be signs of an early transfusion reaction. If there is any doubt, the transfusion must be stopped until the patient can be assessed.

19.7 Completion of the Blood Component transfusion

19.7.1 A unit of Red Cells must be completed within 4 hours of removal from controlled temperature storage. After this time, take down the unit and dispose of any remaining Blood Component in the pack.

19.7.2 Adhere to the WHSCT Guidelines For The Safe Handling & Disposal of Sharps.

19.7.3 It is not necessary to 'flush' the Blood Component administration giving set after the Blood Component transfusion.

19.7.4 Record the following on the Blood Component Transfusion Record:-

a. End time of transfusion.
b. End time observations recorded.
c. Volume transfused (and also record on Fluid Balance Chart if used).

19.7.5 Each Blood Component unit is issued with a Blood Traceability Record. The Staff member must complete accurately (staff name, date and time that the unit was commenced) and return to the Blood Bank. It is a legal requirement that there is an audit trail of what happens to all units of blood donated so that any adverse effects experienced by the recipient either during or after transfusion can be traced back to the donor where necessary (Blood Traceability). For this reason, it is imperative that the Blood Traceability Record is completed accurately (irrespective of the amount of Blood Component transfused).

19.7.6 In the event that a further unit is authorised, disconnect the initial Blood Component pack and attach the next unit using ANTT.

19.7.7 Insert the blue plug on the used Blood Component pack where the Blood Component administration giving set had been inserted.

19.7.8 If the transfusion is completed uneventfully or partially transfused (for reasons other than a suspected transfusion reaction), discard the Blood Component pack with the Blood Component administration giving set attached into an orange lid burn box.

19.7.9 The Compatibility Report must be readily available during the transfusion episode.

19.7.10 When the transfusion of the component is completed the Compatibility Report must be attached to the Blood Component Transfusion Record (or in the patient case notes if ICIP is used).

19.7.11 The Blood Component Transfusion Record should be filed in the patient case notes when the transfusion episode is completed (not relevant if ICIP used).

19.7.12 Patients in the hospital setting should be observed during the subsequent 24 hours for late adverse reactions (or informed of possible delayed reactions).

19.7.13 Provide advice for the patient if discharged within 24 hours of a transfusion Advice for patients who are discharged within 24 hours of a Blood Component Transfusion.

19.7.14 An indication of whether or not the transfusion achieved the desired effect (post transfusion Hb increment rates or improvement in patient symptoms) and details of any reactions to the transfusion should be documented in the patient's case notes[1]. Assessment of post-transfusion Hb level can be performed as early as 15 minutes following transfusion if the patient is not actively bleeding[12].

19.7.15 The discharge letter to the General Practitioner must include:-

a. Reason for transfusion.
b. Number and type of Blood Components administered.
c. Details if any adverse reactions or events.
d. That the patient is not eligible to donate blood in the future.

20.0 MANAGING AND REPORTING OF ADVERSE REACTIONS OR EVENTS

Transfusion reactions can be categorised as 'Acute' – occurring at any time up to 24 hours following a Blood Component transfusion or 'Delayed' – occurring more than 24 hours and up to 14 days post transfusion. If the transfusion is being stopped and not restarted due to a Suspected Transfusion Reaction, this MUST be reported to Blood Bank and documented in the patient case notes.

20.1 If a transfusion reaction is suspected during a transfusion:-

a. Stop the transfusion.
b. Inform a member of medical staff (or Hospital at Night Co-ordinator) immediately.
c. The patient's temperature, pulse, blood pressure and respirations must be recorded.
d. The unit details and patient identification details must be re-checked to ensure that the patient is receiving the correct Blood Component.
e. Visually assess the unit.

f. Follow guidance as per the flow chart "Recognition, initial management and subsequent management and investigations of Acute Transfusion Reactions" on the Blood Component Transfusion Record (Appendix 10).

20.2 If advice given to recommence the Blood Component, document same and ensure that the patient is monitored more closely.

20.3 If a transfusion reaction is suspected and the Blood Component is to be discontinued:

a. The Blood Component administration set must be changed and venous access maintained using normal saline, running slowly to keep the vein open.
b. Contact Consultant Haematologist if specialist advice required.
c. The reaction must be reported immediately to Blood Bank.
d. Any Blood Component remaining in the pack and the administration set must be returned to the Blood Bank for testing.
e. Complete and return the Investigation of a Suspected Transfusion Reaction Form to Blood Bank.
f. Obtain blood and urine samples and ensure other investigations requested as per the Investigation of a Suspected Transfusion Reaction Form.

20.4 A qualified nurse is responsible for ensuring that vital signs are monitored – a doctor must issue instructions on their frequency.

20.5 The volume and colour of any urine passed must be recorded.

20.6 The Haemovigilance Practitioner will complete online reporting to SABRE (if required) following discussion of the adverse reactions or events with the HTT.

20.7 Document details in patient case notes.

20.8 A delayed transfusion reaction can occur up to 14 days post Blood Component transfusion. If a patient has signs and symptoms of a suspected transfusion reaction up to 14 days post a Blood Component transfusion:-

a. Report immediately to Blood Bank.
b. Inform Blood Bank that the Blood Component unit has already been discarded and is not available to return for testing.
c. Complete and return the Investigation of a Suspected Transfusion Reaction Form to Blood Bank.
d. Obtain blood and urine samples from the patient and ensure other investigations requested as per the Investigation of a Suspected Transfusion Reaction Form.
e. Document details in patient case notes.

21.0 GUIDANCE FOR SPECIAL REQUIREMENTS

Some patients benefit from 'special' Blood Components (non-routine) that can be supplied to suit individual patient's needs. Lifesaving transfusions must not be delayed if one or more of the specially prepared Blood Components are not readily available. In such circumstances a clinician must assess the risks versus benefits of transfusing outside of the following recommendations.

Patient groups to consider for specific blood transfusion requirements are:

- Renal or Transplant.
- Antenatal.
- Patients born after 1st January 1996.
- Haematology or Oncology.
- Neonates.

Blood Bank may not always be aware of a patient's specific Blood Component transfusion requirements and are reliant on the clinical area treating the patient to keep them informed. To ensure that an 'Alert Flag' is placed on the Blood Bank Computer System, the clinical area treating the patient must ensure that the Specialist Interest Form is completed and sent to Blood Bank.

21.1 Irradiated Blood Components[22]

Transfusion-Associated Graft-versus-Host Disease (TA-GvHD) is an extremely rare complication of transfusion that is almost invariably fatal. It develops between 1 to 6 weeks following transfusion. At risk patient groups are likely to be immune compromised.

Indications for Irradiated Blood Components include:

- Intrauterine transfusions.
- Neonatal exchange transfusions.
- Top up transfusions for neonates if there has been a previous intrauterine transfusion (up to 40 weeks gestation).
- Patients with severe or suspected T lymphocyte immunodeficiency syndromes.
- Recipients of allogeneic haemopoietic stem cell transplantation from time of initiation of conditioning chemoradiotherapy.
- Patients undergoing autologous bone marrow transplant or peripheral blood stem cell transplant from initiation of conditioning chemoradiotherapy until 3 months post transplant.
- Patients with Hodgkin's lymphoma at any stage of the disease, for life.
- Patients with aplastic anaemia receiving ATG and/or alemtuzumab.
- Patients receiving purine analogue chemotherapy treatment, e.g. fludarabine, cladrabine and deoxycoformycin, require irradiated Blood Components indefinitely. Of note, these individual drugs may be part of combination therapy.
- Patients on other immune suppressants, e.g. bendamustine, clofarabine, alemtuzumab therapy.
- Patients requiring HLA selected components.
- Transfusion from first or second degree relative.
- Granulocyte transfusions.

21.2 CMV Negative Blood Components[23]

CMV can cause severe, sometimes fatal infections in fetus, neonates and immune compromised adults.

Indications for CMV Negative Blood Components include:

- Intrauterine transfusions and any infant up to the chronological age of 20 weeks.
- Elective transfusions during pregnancy (not during labour and delivery).
- When CMV negative Blood Components are not readily available, leucodepleted components are recommended.
- Granulocyte components for CMV seronegative patients.

21.3 HLA Typed Components[2,18]

A HLA type or 'tissue type' is inherited and the immune system uses HLA to distinguish between 'self' and foreign antigens that may enter the body.

Indications for HLA typed platelets include:

- Patients refractory to random platelet components because of development of HLA antibodies after previous transfusions.

Indications for HLA typed Red Cells include:

- Patients awaiting renal transplant and not receiving immunosuppressant drugs.

21.4 HPA Typed Platelets[18]

Indicated for use in:

- Neonatal alloimmune thrombocytopenia and HPA antibodies demonstrated.
- Patients with hypoproliferative thrombocytopenia who continue to be refractory to HLA selected platelets and have HPA antibodies.
- Patients at risk of post transfusion purpura (anti-HPA antibodies detected) and for elective platelet transfusion (Dr Kieran Morris, NIBTS, Personal Communication, December 5th, 2017).

21.5 Methylene Blue Treated Plasma Components[24]

Methylene blue is the current method of choice for the UK blood services for viral inactivation.

Indications for use are:

- All patients born on or after the 1st January 1996.

21.6 Blood Warmers[2]

Blood warmers should be used for the transfusion of red blood cells in patients with:

- Clinically significant cold agglutinins.
- In the management of major haemorrhage.
- In adults undergoing elective or emergency surgery.
- Neonatal Exchange Blood Transfusions – only appropriate if the transfusion is given at a constant rate (warming is not suited to the intermittent bolus nature of a single vessel Exchange Blood Transfusion where the 'push – pull' cycle method is used)[17].

22.0 ACCEPTANCE OF BLOOD COMPONENTS FROM ANOTHER HOSPITAL

Blood Components received from another hospital must be taken to the Blood Bank immediately and handed directly to a member of staff in Blood Bank who will determine the integrity of the units and if they can or cannot be used.

23.0 TRANSFERRING BLOOD COMPONENTS WITH A PATIENT TO ANOTHER HOSPITAL

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

23.1 If unused during the transfer, the Blood Components will most probably be discarded by the receiving Hospital unless the Blood Components are taken directly to the Blood Bank and the packaging has remained sealed.

23.2 Ambulance personnel are not permitted to assist in the blood transfusion process.

23.3 Most receiving hospitals prefer to use Blood Components that have been group & crossmatched by their own Blood Bank.

23.4 As soon as a decision has been made to send Blood Components with a patient to another hospital, Blood Bank should be contacted immediately.

23.5 Inform Blood Bank regarding patient identification details, expected time of transfer and expected destination of patient.

23.6 Blood Bank will pack the Blood Components in a transport box with a seal attached and provide relevant paperwork in pocket at front of box. NB transport boxes used for transfer of Blood Components to another hospital may be different to the transport boxes used within the hospital setting.

23.7 Blood Bank will communicate with the Blood Bank at the receiving hospital and give patient identification details and Blood Component details.

23.8 If the Blood Components are not required in transit do not break the seal on the transport box (documentation pertaining to the transfusion - Blood Traceability Record(s) and Compatibility Report - will be located in the pocket on the front of the box).

23.9 Two qualified members of staff must accompany the patient if it is anticipated that Blood Components are required to be transfused during transfer.

23.10 The two qualified members of staff accompanying the patient must have valid Haemovigilance training and assessment (due every 3 years) in order to administer the Blood Component (section 19.0).

23.11 On arrival at the receiving hospital, inform the clinical team that any unused Blood Components must be transferred to the Blood Bank as soon as possible.

23.12 Return the Blood Traceability Record(s), of any Blood Components transfused during the transfer, to the Blood Bank who had prepared the units for transfer.

24.0 ADDITIONAL INFORMATION FOR BLOOD COMPONENT TRANSFUSIONS UNDERTAKEN BY RAPID RESPONSE NURSING / ACUTE CARE AT HOME TEAMS

a. Within the WHSCT, Blood Component transfusions may be undertaken by the Rapid Response Nursing or Acute Care at Home Teams.
b. When undertaking Blood Component transfusions outside of Altnagelvin, OH&PCC or SWAH hospital setting, Registered Nursing Staff must carry an emergency drug pack of adrenalin and be familiar with the WHSCT protocol and administration information for use of adrenalin in the event of an emergency.

24.1 Patient Selection

24.1.1 Prior to the case being taken on for a transfusion being administered outside of the hospital setting, the patient must have safely completed a Blood Component transfusion in the hospital environment in the previous 12 months.

24.1.2 A member of the referring team for a first time referral to the Rapid Response Nursing Team for a patient to receive a Blood Component Transfusion (or when the treatment intent or transfusion history has changed), must complete the relevant 'Transfusion Referral Form' and return to the relevant Rapid Response Nursing Team.

24.1.3 Blood Component transfusions undertaken by the Rapid Response Nursing or Acute Care at Home Teams are carried out under the express authorisation of a Named Doctor who assumes responsibility for that transfusion and any ensuing complications. The Acute Care at Home Team Doctor will identify the patient groups and define the medical conditions that are considered appropriate for the transfusion of the Blood Components by the Acute Care at Home Team.

24.1.4 The patient must be able to confirm their identity verbally or if unable to do so then a relative or carer will be asked to do so.

24.1.5 Where possible, the patient must have hand washing facilities available and a landline telephone. Nursing staff involved in Blood Component transfusions outside of Altnagelvin, OH&PCC or SWAH hospital setting must have access to their mobile phones (although it is acknowledged that they may not always have a signal).

24.1.6 A Registered Nurse must stay with the patient for the duration of the transfusion and for 30 minutes after completion of the transfusion.

24.1.7 The patient will be given the advice sheet Advice for patients who are discharged within 24 hours of a Blood Component Transfusion or if they regularly receive a Blood Component transfusions outside of the acute hospital setting the patient will be reminded of the procedure to follow if they become unwell after the transfusion.

24.2 Requesting Blood Components when sending a pre-transfusion sample

If the Blood Component transfusion is dependent on a Hb result, write 'Pending Hb result' in the 'Product Request' section of the NI Hospital Transfusion Request Form.

24.3 Organising a Request for a Blood Component for transfusion

24.3.1 Inform Blood Bank that transfusion is for administration outside of Altnagelvin, OH&PCC or SWAH hospital setting and that the Blood Component will be collected by a member of the relevant team.

24.3.2 Rapid Response Nursing Team:-

a. Ensure accurately completed relevant 'Transfusion Referral Form' received (be aware of information documented against 'Transfusion History' and 'Special Requirements').
b. If the written instruction for transfusion is from another Trust, ensure completed accurately (e.g. date of transfusion, patient identification details, Special Requirements, duration of each unit) and attach to the Blood Component Transfusion Record.
c. Confirm hospital location for where Blood Component to be sent to for collection by Rapid Response Nursing Team.
d. Inform Blood Bank of who made the referral for transfusion; discuss transport arrangements (e.g. if units to be transferred via Taxi or WHSCT transport) and if Blood Component Transfusion Record required to be delivered with Blood Component.

24.4 Completion of details on the Blood Collection Form:

24.4.1 If the patient is for a Blood Component transfusion outside of the acute hospital setting, complete patient identification details on the Blood Collection Form from relevant Nursing notes.

24.4.2 When completing a Blood Collection Form (without visiting the patient prior to collecting the Blood Component), then the Stamper '*Patient identification details have not been checked with the patient or the patients identification wristband – Home Transfusion*' should be applied to the section 'Blood Collection Form completed by'.

24.5 Collecting a Blood Component for transfusion

24.5.1 Prior to collecting the Blood Component, contact Blood Bank to ascertain the time that the Blood Component will be available.

24.5.2 An accurately completed (section 16.3) Blood Collection Form is required to remove the Blood Component from the Blood Issue Fridge or the Blood Collection Area.

24.5.3 **Altnagelvin Hospital**: Blood Bank will remove the Blood Component from the Blood Issue Fridge.

SWAH: Monday to Friday 09.00hrs to 17.00hrs excluding Bank Holidays - Blood Bank will remove the Blood Component from the Blood Issue Fridge; Out of hours - a member of the Rapid Response Nursing Team with valid Haemovigilance training and assessment undertakes removal of the Blood Component from the Blood Collection Area (section 17.2).

OH&PCC: A member of the Rapid Response Nursing Team with valid Haemovigilance training and assessment undertakes removal of the Blood Component for transfusion from the Blood Collection Area (section 17.2).

24.6 Transport Boxes

24.6.1 If collecting a Blood Component from Blood Bank, the staff member brings a validated transport Box and cool packs (if collecting Red Cells) to the Blood Collection Area.

24.6.2 **Altnagelvin Hospital**: Blood Bank will pack the transport box.

SWAH: Monday to Friday 09.00hrs to 17.00hrs excluding Bank Holidays - Blood Bank will pack the transport box; Out of hours - a member of the Rapid Response Nursing Team with valid Haemovigilance training and assessment will pack the transport Box (Appendix 11).

OH&PCC Hospital: A member of the Rapid Response Nursing Team with valid Haemovigilance training and assessment will pack the transport box (Appendix 11).

24.6.3 Once the Blood Component has been collected from the Blood Collection Area, the transport box must be transported in the boot of the vehicle to protect the box from excessive heat generated by sunlight.

24.6.4 In addition:-

a. Ensure compliance with all road traffic and transport laws and requests by the Police.
b. Do not remove or tamper with the consignment or its contents.
c. Any prolonged delays due to traffic conditions/breakdown must be communicated immediately to Blood Bank.
d. You must inform Blood Bank of any loss or damage to the consignment as soon as possible.

24.7 More than one Blood Component being collected

When the transfusion is being undertaken by the Rapid Response Nursing or Acute Care at Home Teams in an out of hospital facility and more than one Blood Component is being collected from Blood Bank at the same time, the following criteria must be adhered to:

a. Each unit must be packed appropriately in separate transport boxes.
b. For Red Cells, 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. These transport boxes have been locally validated by the Blood Bank to maintain Red Cells at $4^0C \pm 2^0C$ for a maximum of 2 hours, i.e. Red Cells can remain in the sealed transport box for 2 hours. Once this time (2 hours) has elapsed, the transfusion must be completed within the next 4 hours.
c. The unit of Red Cells is only removed from the transport box immediately prior to commencement of the transfusion.
d. Once the seal is broken on the transport box, the unit of Red Cells must be completed within 4 hours of the time the seal was broken.
e. If the patient's condition changes and the Blood Component transfusion is no longer required all unused Blood Components must be returned to the Blood Bank / Blood Issue Fridge for the final fate to be recorded. Inform Blood Bank to ascertain what to do with the unused Blood Components.

24.8 Pre-commencement of transfusion

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 relevant Doctor to ascertain if it is safe to continue with the transfusion and document decision in patient case notes.

24.9 Managing and reporting of Adverse Reaction or Events

24.9.1 Any abnormalities observed should be reported to the Team Leader and a member of medical staff contacted immediately. Acute Care at Home Team - for medical assistance after 20:00 hours contact the Team Lead and GP out of hours.

24.9.2 If a severe reaction is suspected outside of Altnagelvin, OH&PCC or SWAH 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.

24.9.3 The member of Nursing staff 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.

24.9.4 The member of Nursing staff will inform the receiving clinical area of relevant details and complete the Investigation of a Suspected Transfusion Reaction Form and forward to Blood Bank. The additional tests and investigations required to be undertaken for the Suspected Transfusion Reaction will be undertaken in the clinical area where the patient has been admitted.

25.0 REPORTING HAEMOVIGILANCE INCIDENTS

a. **Serious Adverse Reaction** - an unintended response in a donor or in a patient that is associated with the collection, or transfusion of blood or Blood Components that is fatal, life-threatening, disabling or incapacitating, or which results in or prolongs hospitalisation or morbidity[25].
b. **Serious Adverse Event** - any untoward occurrence associated with the collection, testing, processing, storage and distribution, of blood or Blood Components that might lead to death or life-threatening, disabling or incapacitating conditions for patients or which results in, or prolongs, hospitalisation or morbidity[25].
c. **Near Miss Event** - any error which if undetected, could result in the determination of a wrong blood group or the issue, collection, or administration of an incorrect, inappropriate or unsuitable Blood Component but which was recognised BEFORE transfusion took place.
d. SHOT invites voluntary reporting of serious adverse reactions, errors and events as well as near-miss incidents[3]. Under the BSQR[5], there is a legal requirement to investigate and report serious adverse reactions and events to the MHRA via SABRE[2].
e. The Blood Bank must be notified immediately of any Serious Adverse Reactions, Serious Adverse Events or Near Miss Events. Blood Bank will inform the Haemovigilance Practitioner for further investigations.
f. The Haemovigilance Practitioner report incidents as is legally required to SABRE and assist relevant teams as required if the incident is escalated to the Northern Ireland Public Health Authority.
g. All suspected blood transfusion reactions (if transfusion is discontinued), serious adverse events and near miss events must be reported via Datix as per the Trust's Incident Reporting Policy.

26.0 IMPLEMENTATION OF POLICY

The Policy should be adhered to by all staff involved in the blood transfusion process. The Policy will be available for all staff to access on the WHSCT Intranet. Trust Communication will be used to inform staff when the Policy has become an active document and available for use.

27.0 MONITORING

The Policy will be monitored in the following ways:

- It will be listed on the WHSCT Intranet.
- It will be the responsibility of the Haemovigilance Practitioners, on behalf of the Hospital Transfusion Committee, to ensure it is updated and reviewed within the stated timescales or when amendments are required.
- The Policy will be reviewed in five years and appropriate changes made where necessary.

28.0 REFERENCES

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29.0 CONSULTATION PROCESS

This policy has been developed with the assistance of the Equality and Involvement Team. Comments from members of the WHSCT Hospital Transfusion Committee and the WHSCT Nursing and Midwifery Group have been considered and incorporated where appropriate.

30.0 EQUALITY STATEMENT

In line with duties under the equality legislation (Section 75 of the Northern Ireland Act 1988), Targeting Social Need Initiative, Disability Discrimination and the Human Rights Act 1998, an initial screening exercise to ascertain if this guidance should be subject to a full impact assessment has been carried out. The outcome of the Equality screening for this guidance is:

Major Impact	☐
Minor Impact	☐
No Impact	√

31.0 APPENDICES

Appendices to this guideline are as follows:

- Appendix 1 – Clinical benefits of a Blood Component transfusion
- Appendix 2 – Labelling a Cord Sample
- Appendix 3 - Confirmation Sample
- Appendix 4 – Sealed Transport Boxes
- Appendix 5 – Integrity of Blood Component Unit
- Appendix 6 – Blood Group Compatibility Chart
- Appendix 7 – Neonatal Blood Component administration set
- Appendix 8 – Guidance for Clinical Staff to Support Patient Consent for Blood Transfusion
- Appendix 9 – Northern Ireland Blood Transfusion Service Blood Component label
- Appendix 10 - Recognition, initial management and subsequent management and investigations of Acute Transfusion Reactions
- Appendix 11 - Packing Configuration for CliniMed Transport Boxes

APPENDIX 1 Clinical benefits of a Blood Component transfusion[2]

1. Transfusion should only be used when the benefits outweigh the risks and there are no appropriate alternatives.
2. Results of laboratory tests are not the sole deciding factor for transfusion.
3. Transfusion decisions should be based on clinical assessment underpinned by evidence-based clinical guidelines.
4. Not all anaemic patients need transfusion (there is no universal 'transfusion trigger').
5. Discuss the risks, benefits and alternatives to transfusion with the patient and gain their consent.
6. The reason for transfusion should be documented in the patient's clinical record.
7. Timely provision of blood component support in major haemorrhage can improve outcome – good communication and team work are essential.
8. Failure to check patient identity can be fatal. Patients must wear a patient identification band with name, date of birth and unique identification number. Confirm identity at every stage of the transfusion process. Patient identifiers on the patient identification band and blood pack must be identical. Any discrepancy, DO NOT TRANSFUSE.
9. The patient must be monitored during the transfusion.
10. Education and training underpin safe transfusion practice

APPENDIX 2 Labelling a Cord Sample

RhD Negative Mum
Labelling of Mum & Cord Sample

PURPLE – Maternal sample (Kleihauer Test)

- No addressograph labels on either sample.
- H&C number is unique identification number.

At delivery 2 blood samples taken & both samples must be labelled with mums details (first name, surname, date of birth & unique identification number) which must correspond with mum, patient identification band & request form.

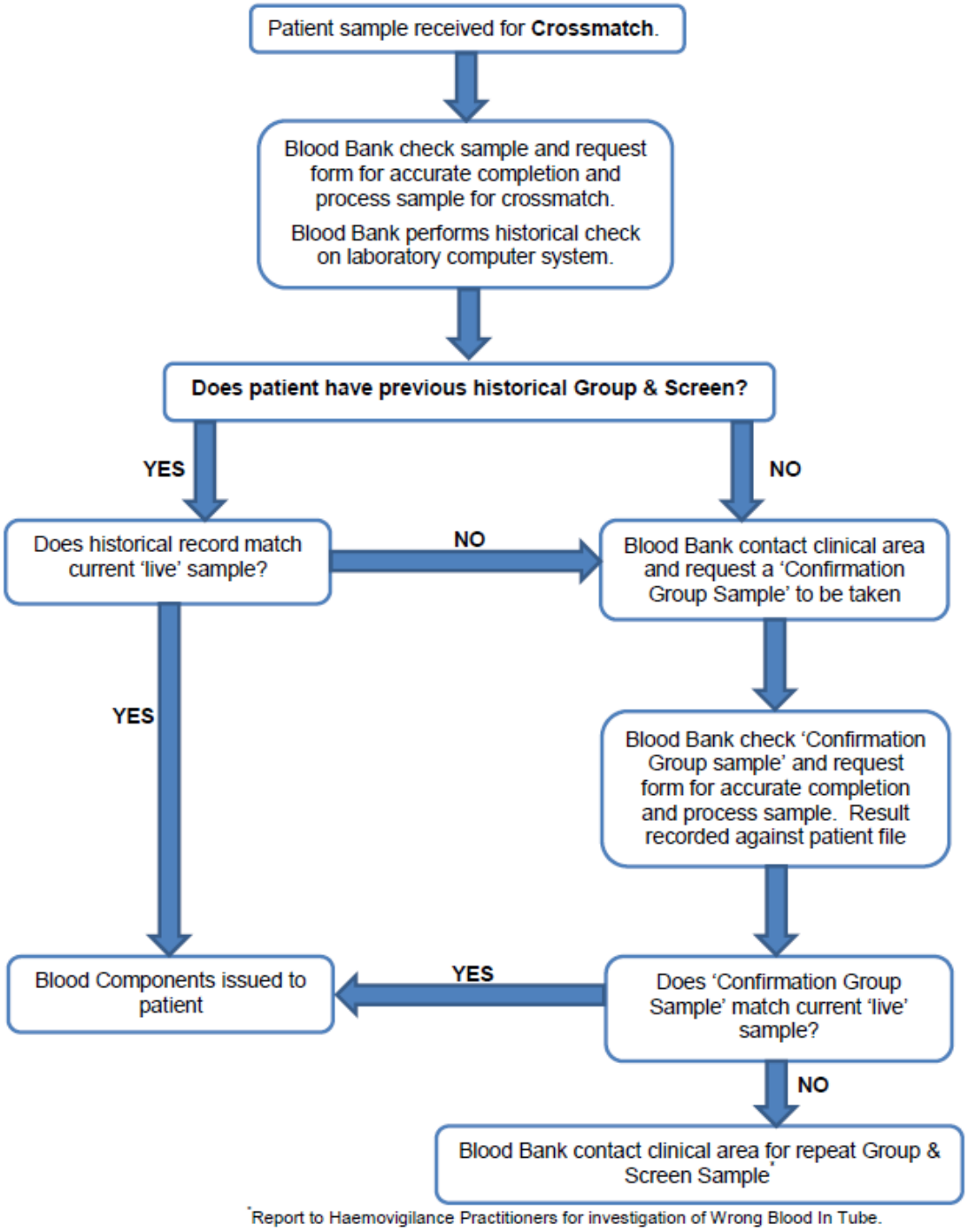
- **Cord Sample** - taken from Cord, must be labelled as '**Cord Sample**'.
- **Maternal Sample** – Taken from mum

PINK – Cord Sample

Western Health and Social Care Trust

- Cord Sample: Determines RhD group of Infant.
- Maternal Sample: Kleihauer test undertaken if Cord sample RhD positive Infant and to determine dose of anti-D required.

APPENDIX 3 Confirmation Sample



*Report to Haemovigilance Practitioners for investigation of Wrong Blood In Tube.

APPENDIX 4 Sealed Transport Boxes

Sealed Transport Boxes

1. Do not break seal until need to use units.
2. If break seal, record date & time seal broken.

Unopened

- 2 hours storage in clinical area.
- If returned unopened within 2 hours, Blood Bank can put units back into Blood Bank stock.
- Returned >2 hours, units wasted.

Opened within 2 hours

- Transfuse units within 4 hours of time seal broken.
- If units unused, must be returned to Blood Bank within 30 minutes of seal broken.
- If returned >30 minutes, units wasted.

Opened after 2 hours

- Transfuse units within 6 hours of time units packed in transport box.
- If returned to Blood Bank, units wasted.

APPENDIX 5 Integrity of Blood Component Unit

Best Practice points:

1. Prior to administration check the integrity of every unit received:-

- Check for clots & clumps.
- Check seams of unit for leakage.
- Check port sites for leakage.
- Check expiry date.

If any of the above is identified do not commence the transfusion. Contact Blood Bank.

2. When connecting the blood administration giving set to the unit, take care when inserting the sharp end of the giving set into the port site.

3. During transfusion, check to ensure that the blood is flowing through the administration giving set. If any leakage is identified stop the transfusion and contact Blood Bank.

4. Document in nursing notes any issues identified during the transfusion.

APPENDIX 6 Blood Group Compatibility Chart[3]

Patient ABO D blood group	Compatible RED CELLS	Compatible FRESH FROZEN PLASMA / OCTAPLAS / CRYOPRECIPITATE	Compatible PLATELETS
Unknown	O	AB, A*, B*	AB, A*, B*, O*
O	O	O, A, B, AB	O, A, B, AB
A	A, O	A, AB, B*	A, AB, B*, O*
B	B, O	B, AB, A*	B, AB, A*, O*
AB	AB, A, B, O	AB, A*, B*	AB, A*, B*, O*
Pos	Pos or Neg	Not applicable	Pos or Neg
Neg#	Neg#	Not applicable	Neg#

Compatible blood groups are listed in order of preference

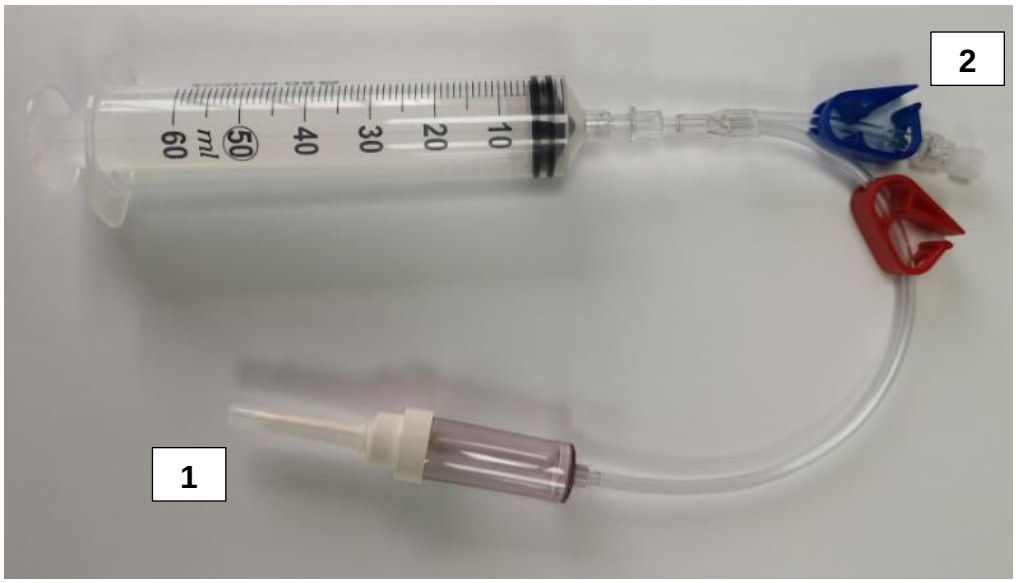
*Issued when permitted due to component availability

D positive red cells & platelets may be issued for D negative women over the age of 50yrs and D negative males of any age according to availability and urgency of transfusion

Version 1.2 February 2018 Review Date: May 2018

If you are unsure about the compatibility of any component for your patient always check with Blood Bank laboratory before starting the transfusion.

APPENDIX 7 Neonatal Syringe Set



1. Ensure that the Neonatal Syringe Set tubing is in the correct position within the clamps (i.e. in the centre of the clamps).
2. Close the Red and Blue clamps prior to drawing up the Blood Component (**you must hear a 'click' sound, if not check that the clamps are secure**).
3. Attach the Neonatal Syringe Set to the Blood Component pack using ANTT (**Number 1** in diagram).
4. Partially fill the chamber.
5. Open the Red clamp and draw up required Blood Component volume plus amount for priming into the Neonatal Syringe Set.
6. Close the Red clamp, ensuring that you have heard a 'Click' (**if not check that the clamp is secure**).
7. Invert the syringe allowing the air to settle at the end of the syringe.
8. Keeping the syringe inverted, open the Blue clamp and prime the line leaving the required volume in the Neonatal Syringe Set using ANTT.
9. Close the Blue clamp.
10. Place the syringe in the pump and set the rate.
11. Open the Blue clamp and commence the Blood Component transfusion.

APPENDIX 8 Guidance for Clinical Staff to Support Patient Consent for Blood Transfusion

SaBTO
Advisory Committee on the Safety of Blood, Tissues and Organs

GUIDANCE FOR CLINICAL STAFF

TO SUPPORT PATIENT CONSENT FOR BLOOD TRANSFUSION

Patient may require Blood / Blood Component Transfusion

Patients receiving a blood transfusion (red cells, platelets or plasma) whether for a medical or surgical cause should be informed of the indication for the transfusion including risks, benefits and alternatives. A record of this discussion should be documented in the patient's clinical records.

Ideally the decision to transfuse should be made with the patient or parent/carer in advance of any planned transfusion.

In the emergency setting, the information will need to be given retrospectively.

Prospective Information

Valid consent* should be obtained prior to any planned transfusion and documented in the patient's clinical record.

*Valid consent entails the provision of information on risks, benefits and alternatives available before asking the patient to give consent. This does not have to include a signature from the patient.

Retrospective Information

Patients treated in emergency setting where it was not possible to obtain valid consent pre-transfusion.

Patients who were told pre-procedure (e.g. pre-operatively) that they *might* require a transfusion then need to be informed whether they did/did not receive a transfusion.

Key issues to be discussed when obtaining valid consent

1. The following information should be discussed:
   - Type of blood / blood component
   - Indication for transfusion
   - Benefits of the transfusion
   - Risks of transfusion
   - Possible alternatives to transfusion
   - How the transfusion is administered and the importance of correct patient identification
   - Inform patient that following a blood transfusion they can no longer be a blood donor.
2. Provide written information.
3. Check if patient needs time to consider or requires further information.
4. Document the discussion in the patient's clinical records.

At discharge

1. If patient has had a transfusion, ensure that they have been informed.
2. Record information about the transfusion in the discharge summary, also stating that the patient has been informed.

Version 1.1 December 2011

Resources

This guidance applies to the transfusion of all blood components **(red cells, white cells, platelets, fresh frozen plasma & cryoprecipitate)** and should be used by healthcare organisations to strengthen the consent processes already in place.

Specific guidance should also be used to ensure that alternatives have been considered for blood and blood components e.g. pre-operative iron therapy, intra-operative cell salvage where appropriate for avoidance of red cell transfusion and prothrombin complex concentrate in place of FFP for warfarin reversal.

Adverse events

Clinical teams involved with the prescribing and administration of blood and components must be aware of adverse events that can be associated with transfusion including prompt recognition and management (www.shotuk.org). These include:

Incorrect Blood Component Transfused (IBCT)	Inappropriate, Unnecessary, Under/Delayed Transfusion (IandU)
Acute and Haemolytic Transfusion Reactions (ATR and HTR)	Transfusion-Transmitted Infection (TTI)
Transfusion-Associated Circulatory Overload (TACO)	Transfusion Associated Acute Lung Injury (TRALI)
Transfusion-Associated Dyspnoea (TAD)	Transfusion Associated Graft-versus-Host Disease (TA-GvHD)
Post Transfusion Purpura (PTP)	

Clinicians should refer to the HPA website (www.hpa.org.uk) to get the latest information on the risks of transmissible infections. Current guidance from the HPA states that the risk of getting hepatitis from a blood transfusion in the UK is currently (January 2011) about 1 in 670,000 for hepatitis B and 1 in 83 million for hepatitis C. The chance of getting HIV (Human Immunodeficiency Virus) infection is about 1 in 5 million or HTLV (Human T-Lymphotropic Virus) infection is about 1 in 18 million.

Although the risk of getting variant Creutzfeldt-Jakob Disease (vCJD) from a blood transfusion is probably very low with a single blood transfusion, the risk of any infection will increase with each additional blood component.

Long-term transfusion-dependent patients

Long-term transfusion-dependent patients will need modified consent. This should where possible include an initial discussion at the start of a transfusion regime with a regular update including appropriate information regarding the benefits and risks of transfusion and specific relevant issues e.g. iron overload, risk of allo-immunisation including haemolysis risks (red cells) and platelet refractoriness (HLA antibodies), infective risks and other transfusion reactions.

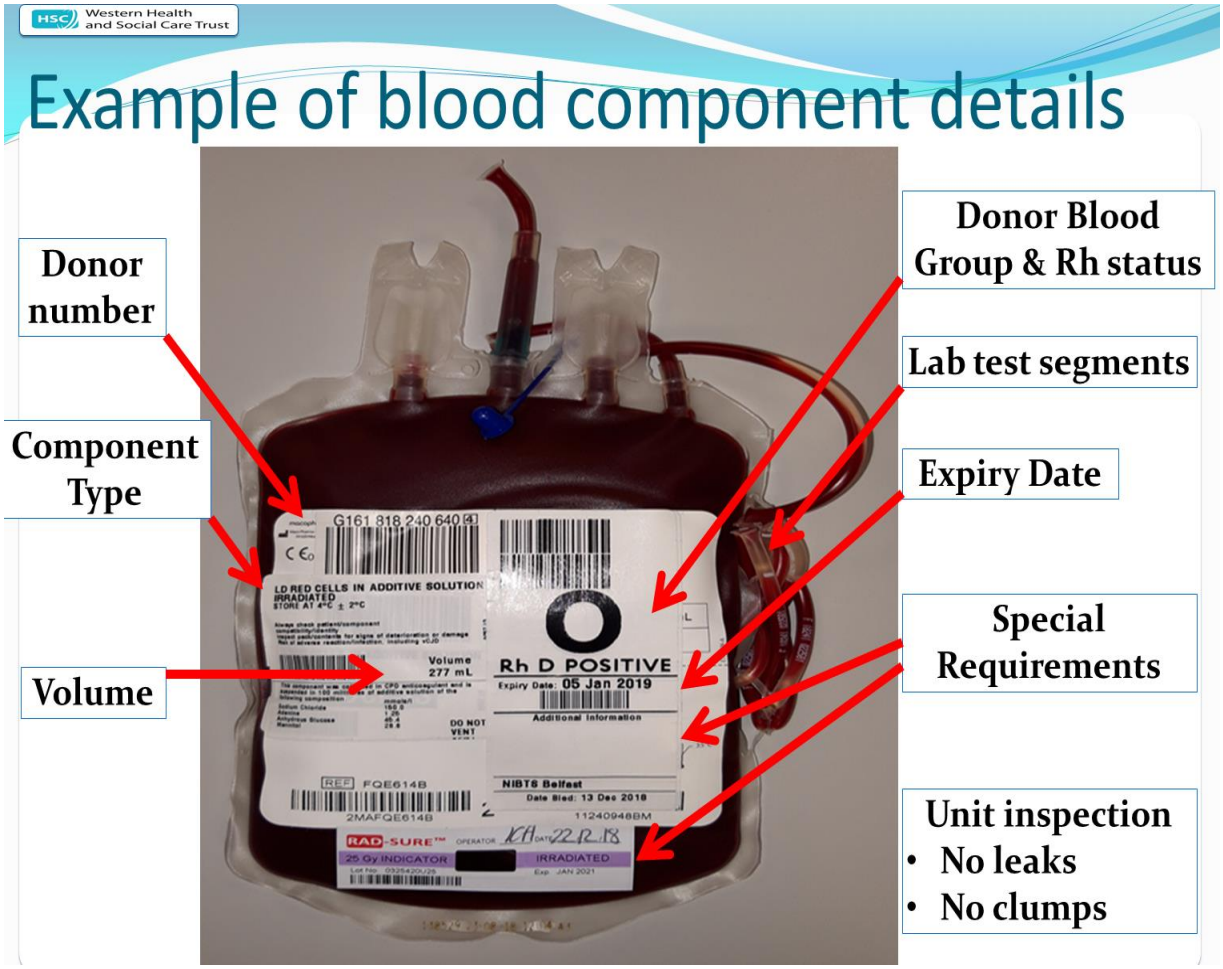
Other information

Where needed, patients should be provided with contact details of key specialists for further discussion around blood transfusion issues relevant to their specific clinical diagnosis e.g. hospital transfusion practitioner, local haematologist or other clinician such as anaesthetist, surgeon or obstetrician.
The Trust website can be used to provide information for patients about consent and safe blood transfusion.

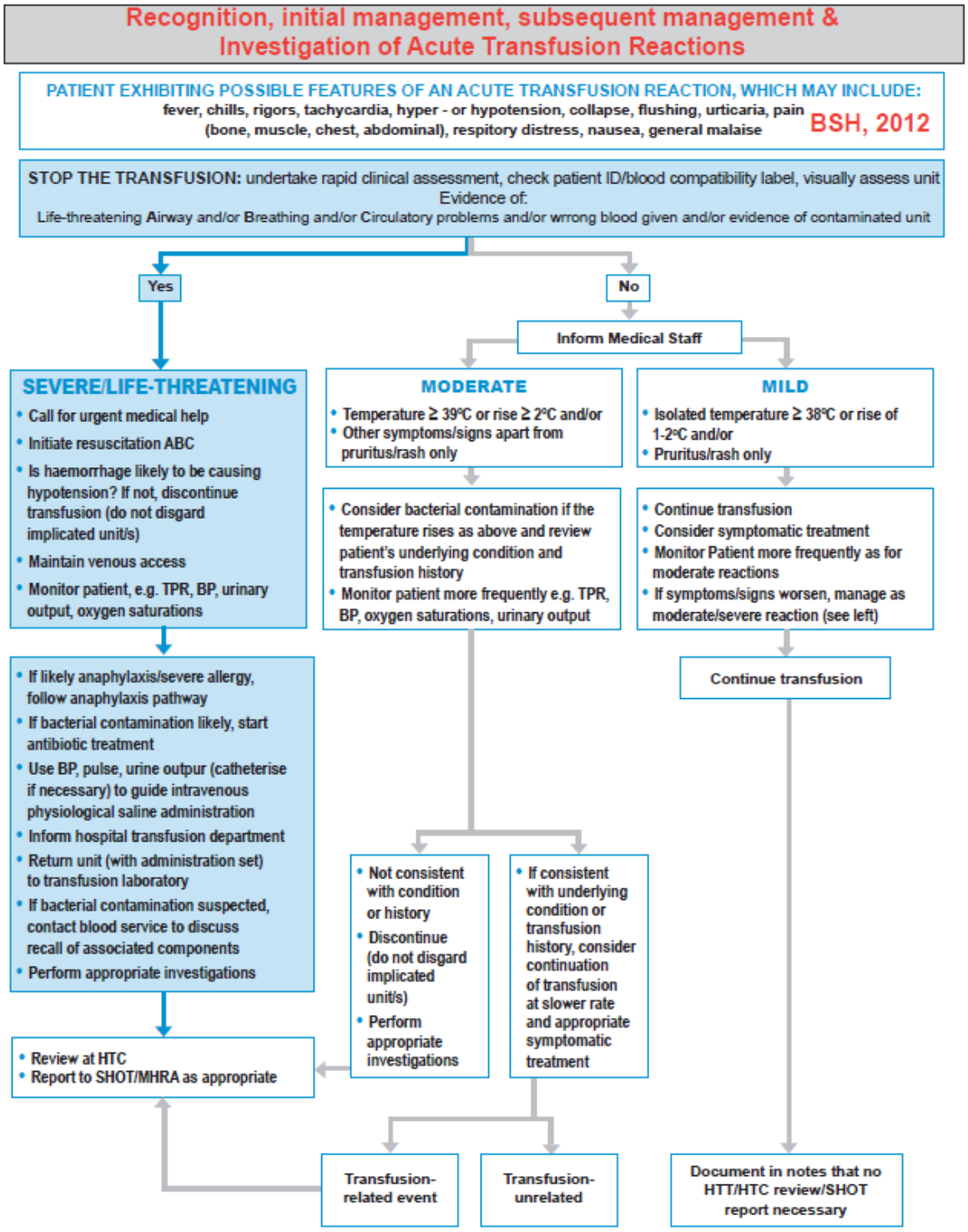
Useful websites	www.transfusionguidelines.org.uk	www.blood.co.uk
www.nhs.uk/conditions/blood-transfusion	www.nhshealthquality.org	www.shotuk.org
www.bpa.org.uk	www.bcshguidelines.co.uk	www.sign.ac.uk/guidelines/

Patient information leaflets are available from : www.hospital.blood.co.uk

APPENDIX 9 Northern Ireland Blood Transfusion Service Blood Component label

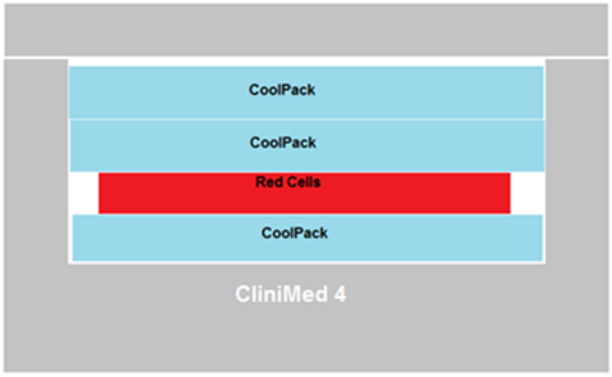
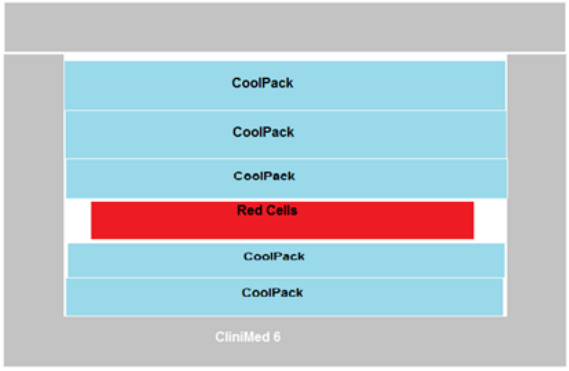


APPENDIX 10 Recognition, initial management and subsequent management and investigations of Acute Transfusion Reaction



APPENDIX 11 - Packing Configuration for CliniMed Transport Boxes

CliniMed Blood Transport boxes may have a white or red outer covering. Both types of boxes have been validated by the Blood Bank for 2 hours transport when secured with a tamperproof security seal.

CliniMed BloodPorter 4	CliniMed BloodPorter 6
1. Open Velcro sides of transport box and remove polystyrene lid.	1. Open Velcro sides of transport box and remove polystyrene lid.
2. Place 1 cool packs in the bottom of the polystyrene box.	2. Place 2 cool packs in the bottom of the polystyrene box.
3. Place unit of red cells on top of cool pack.	3. Place unit of red cells on top of cool packs.
4. Place 2 cool packs on the top of the red cell unit.	4. Place 3 cool packs on the top of the red cell unit.
	
5. Ensure that all residual space is filled with cool packs.	
6. Replace polystyrene lid and secure Velcro sides.	
7. Attach a tamperproof security seal.	

32.0 Signatories

Responsible Officer

Printed name: Mary P. McNicholl	Date: 21/02/2019
Signature: Mary P. Mc Nicholl	
Job title: Haemovigilance Practitioner	

Responsible Director

Printed name: Dr Patrick Stewart	Date:
Signature:	
Job title: Consultant Anaesthetist, Associate Medical Director for Clinical Governance & Patient Safety, Chair of WHSCT Hospital Transfusion Committee	