North West Anglia NHS Foundation Trust

Blood Transfusion Policy
Version 12

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VERSION CONTROL SUMMARY

Version:	Page/Section of Document:	Description of change:	Date Exec Director/Chair of DLB approval given for change of review date only	Date approved:	Date published:
2		Review led by Dr M Sivakumaran		July 2004	
3		Review led by K Bowen (Transfusion Coordinator) and E Didsbury (Haematology Manager)		September 2006	September 2006
4		Review led by K Bowen (Transfusion Coordinator) and E Didsbury (Haematology Manager)		September 2009	September 2009
5		Telephone numbers changed to reflect move to PCH		September 2009	September 2009
6		Information on out of hospital transfusions added		September 2009	September 2009
7		Amendments to training responsibilities and addition of transfusion non participation notice Changes to CMV negative/ irradiated blood component indications Addition of advice from National Comparative Audit of blood transfusion regarding recording of 15 minute observations Addition of section 15 Additional advice for paediatric red cell transfusions (author: Dr D Yong, consultant paediatrician)		20/6/2012	12/10/2012
8		Transfusion Operational Management Team roles and responsibilities added. Use of red boxes for internal transfer discontinued. Stamford Transfusion laboratory references removed. Advice on management of an acute transfusion reaction amended to reflect new guidelines, and flowchart for management of a transfusion reaction replaced with Eastern		11/12/2013	January 2014

		Region Transfusion Committee flowchart Compliance monitoring table amended.			
9		New national guidance Amendment to Blood Product Request and Specimen Labelling (section 7)		12/5/2015	May 2015
10		NICE Guidelines incorporated on Iron deficiency anaemia, use of Tranexamic acid in surgical patients Two registered healthcare professionals to check the blood at the bedside, one must hold a permanent service contract with the trust. Introduction of Hepatitis E Negative components by NHS Blood & Transplant Extended post thaw timescale for FFP thawed for use in major haemorrhage Transport box time amended from 3 to 2 hours maximum storage Advice on observation for late reactions Amended Regional Flowchart for dealing with Acute Transfusion Reaction		15/11/2016	23/11/2016
11		Merging of policies for all sites to harmonise policies under NWAFT		22/7/2020	14/8/2020
12		Addition of process for concessionary release of blood		14/7/2022	22/7/2022

CONTENTS

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Any printed copies must be checked against the Document Library version to ensure that the latest version is being used.

1. INTRODUCTION

1.1 This policy has been produced to ensure the safe and effective use of blood and blood products in the Trust.

The policy is to be used in all clinical areas, and by all members of staff involved in the sampling, handling, prescription and administration of blood products and components.

It incorporates national & international guidelines and legislation, and directives from the Department of Health.

Transfusion of blood components and blood products is a vital element of care for many patients providing clinical benefits including those that are lifesaving. However the procedure is not without risk and errors can cause severe illness or even death. Under these circumstances, transfusion of blood components or blood products must only be undertaken if no alternative therapy is available. While the incidence of hazards of transfusion such as viral transmission has reduced dramatically, there are still significant risks associated with transfusion.

North West Anglia NHS Trust has two pathology departments; one at Hinchingbrooke hospital and one at Peterborough City Hospital. Both of these have a Blood Transfusion Service. This policy has been developed with The Hospital Transfusion Committee, which contains representatives of all the organisations above.

2. OBJECTIVES/AIMS

2.1 The aim of this policy is to:

Provide a clear framework and guidance for safe transfusion practice.

Ensure a consistent safe approach to the prescribing, handling and administration of blood products and components throughout the trust.

Ensure that all members of staff involved in any stage of the process of transfusing blood components and blood products are fully conversant with their role and the legal aspects of this procedure.

3. DUTIES, ROLES and RESPONSIBILITIES

3.1 Appendix B outlines the duties and responsibilities for key personnel and committees relating to this document. While the appendix identifies specific roles and responsibilities to key post holders, it is important to remember that all staff have a duty to read procedural documents relevant to their practice and comply with them. Failure to do so may result in performance or disciplinary action being taken. They should identify their training needs in respect of procedural documents and bring these to the attention of their manager.

4. TRAINING and COMPETENCY

4.1

All staff participating in transfusion must attend mandatory training as set out in the trust's Training Needs Analysis. Where staff fail to attend, the process to be taken is described the trust Mandatory Training Policy.

In addition to this, staff must also demonstrate competency in the part of the transfusion process they are participating in, as detailed in the trust's policy for competency assessment of Staff involved in collecting blood components for transfusion, and/or caring for a patient having a transfusion There are two different competency assessments for transfusion. One for Registered Healthcare Professionals, which incorporates caring for patients having transfusions and collection of blood products. The second competency assessment is for non-registered staff who are involved in the collection of blood products only.

Porters and Laboratory Staff, who only move blood components between blood banks and do not collect individual units and take them to the patient for immediate transfusion, must complete a separate competency assessment with the Transfusion Practitioner or as part of their laboratory competency record.

Any members of staff who take blood samples for pre transfusion testing must complete the trust competency assessment in venepuncture, and staff who access intravenous devices must complete the trust competency assessment for administration of IV drugs. Policies for both of these assessments are available on the intranet.

5. PROCESS and CONTENT

5.1

Blood Products and their Storage

This section contains details about the range of blood components available and their safe storage**.** For guidance on the use and prescribing of specific components, please see separate policies and guidelines, available on the intranet.

Red cells
Red cells are received from the National Blood Service via the Blood Transfusion Centre at Cambridge. They have a 35-day shelf life from the day of donation and must be stored in a designated blood bank refrigerator between 4 and 6ºC.

Red cells must only be removed from the refrigerator when carrying out laboratory tests, moving stock from one refrigerator to another, or from a refrigerator to the patient's bedside.

A unit removed from the refrigerator can be returned to the refrigerator at any time up to and including 30 minutes from the time that it was removed. Any unit returned to the refrigerator must have the time of return clearly documented on the issue paperwork and the laboratory informed.

After being out of controlled storage for over 30 minutes the unit must be returned to the transfusion laboratory. Laboratory staff will determine whether the unit is safe to remain available for use.

If there is any doubt as to whether a unit is safe for use, it MUST be returned to the transfusion laboratory immediately, who will assess the unit and if required either quarantine the unit or ensure its safe disposal. Unused units must not be disposed of by clinical staff.

Where red cells are required to be out of the refrigerator for longer periods of time, for example when being transported between hospitals, transport boxes are available with cool packs. A label will be put on to the box to indicate when the red cells were placed inside. If red cells need to be transported outside the hospital, the transfusion laboratory MUST be contacted to organise this.

Blood transfusion staff will inspect the refrigerator's contents on a regular basis and verify that all units can be accounted for.

Red Cell products must never be stored in a domestic, drug, or specimen refrigerator on the ward, in clinics or in theatre.

For information on the use of red cells, please refer to the separate guidelines available on the intranet.

Platelets

Platelets are stored at 22ºC in an approved incubator, with constant gentle agitation.
At Peterborough platelets can be collected from the issue agitator adjacent to the main blood issue fridges in the Blood Bank.
At Hinchingbrooke the platelet agitator is kept within the laboratory and thus to collect platelets please summon the attention of the lab staff (bell is adjacent to the hatch).

Platelets must *NEVER* be stored in a refrigerator.

Platelets have a maximum shelf life of 7 days from donation to use/disposal. Because of their short shelf life they are not routinely kept in stock. When requesting platelets, consideration must therefore be given to allow adequate time for transport from the NHS Blood and Transplant centres, which will be a minimum of 2 hours, but may take longer, depending on availability. A ‘blue light’ service is available for life threatening conditions which may be requested through the transfusion laboratory by the clinician in charge of the case

For information on the use of platelets, please refer to the separate guidelines available on the intranet.

Fresh Frozen Plasma

Fresh frozen plasma (FFP) is stored at -30ºC for up to 36 months from the date of issue from the National Blood Service. It is available for the correction of coagulation deficiencies in specific situations, and comes as a single bag approximately 270ml.

FFP takes 20- 30 minutes to thaw, and for maximum efficacy should be administered as soon as possible after thawing**.**

FFP packs are stored at 4ºC once thawed, and must be used within 24 hours of thawing- there will be a note to this effect on the compatibility form issued with the pack. If not used within that time, it must be returned to the laboratory for disposal. For FFP thawed to treat major haemorrhage, the shelf life may be extended up to a maximum of 120 hours for the same patient, if stored at 4°C, however it should be borne in mind that extended post-thaw storage will result in a decline in the content of labile coagulation factors.

Unused packs must be returned to the transfusion laboratory for safe storage if transfusion is not started within 30 minutes of removal from the fridge.

FFP is not to be used as a prophylactic measure**.** Other than in a massive haemorrhage, it will only be issued if a coagulation screen has been performed to assess the degree of deficiency. If there is a dispute between the clinical and haematology laboratory staff then the issue will be determined by a Consultant Haematologist
Virally inactivated FFP, treated with Methylene blue or solvent detergent, is no longer required for patients born after 1st January 1996, but may continue to be issued whilst stocks are available.
For information on the use of FFP, please refer to the separate guidelines available on the intranet.

Cryoprecipitate
Cryoprecipitate is stored at -30ºC for up to 36 months from the date of issue from the National Blood Service.
Cryoprecipitate takes approximately 20- 30 minutes to thaw, and for maximum efficacy should be administered as soon as possible after thawing**.**

Cryoprecipitate must be kept at room temperature for up to 4 hours once thawed. If not used within that time, it must be returned to the laboratory for disposal.

One unit of cryoprecipitate contains 0.1 to 0.2 grams of fibrinogen and approximately 100 IU (international units) of Factor VIII. Currently, cryoprecipitate comes ready pooled and each bag is equivalent to 5 standard units.

For information on the use of cryoprecipitate, please refer to the separate policy available on the intranet.

Other Blood Products
E.g.: Human Albumin Solution (HAS), Prothrombin Complex Concentrate (Octaplex), Praxbind, Factor VIIa (Novo seven), Factor VIII, FEIBA, Riastap, and Anti D

The above products are stored in temperature controlled conditions, and issued by the transfusion laboratory. HOWEVER, some may not be immediately available at all hospital sites. They will be issued on demand for named patients.

5.2 The Decision to Transfuse

Transfusion of blood and blood products is a vital element of care for many patients providing clinical benefits including those that are lifesaving. However the procedure is not without risk. There is an intrinsic risk from the blood itself, although small, of Blood Borne infections, and transfusion reactions, and an extrinsic risk of errors. Both of these factors can cause severe illness or even death. Thus the decision to give blood must not be taken lightly and risk versus benefit should be considered and, where possible, discussed with the patient. Transfusion of Blood and Blood components must only be undertaken if no alternative therapy is available.

Staff should make every effort to ensure the appropriate use of a limited resource, and always consider the use of alternatives where possible.

The National Institute for Clinical Excellence (NICE) provide guidelines on Blood Transfusion (NG24) which cover the assessment for and management of blood transfusions in adults, young people and children over 1 year old and have also issued the following "**Do Not Do**" notices:-

"DO NOT DO" Notice title	**Published**
Do not routinely transfuse more than a single dose of platelets. Only consider giving more than a single dose of platelets in a transfusion for patients with severe thrombocytopenia and bleeding in a critical site, such as the central nervous system (including eyes).	November 2015
Do not offer fresh frozen plasma transfusions to correct abnormal coagulation in patients who are not bleeding (unless they are having invasive procedures or surgery with a risk of clinically significant bleeding) or need reversal of a vitamin K antagonist.	November 2015
Do not offer erythropoietin to reduce the need for blood transfusion in patients having surgery, unless the patient has anaemia and meets the criteria for blood transfusion, but declines it because of religious beliefs or other reasons or the appropriate blood type is not available because of the patient's red cell antibodies.	November 2015
Do not routinely offer prophylactic platelet transfusions to patients with any of the following: chronic bone marrow failure, autoimmune thrombocytopenia, heparin-induced thrombocytopenia, thrombotic thrombocytopenic purpura.	November 2015

Do not offer prophylactic platelet transfusions to patients having procedures with a low risk of bleeding, such as adults having central venous cannulation or any patients having bone marrow aspiration and trephine biopsy.	November 2015
Only consider fresh frozen plasma transfusion for patients with clinically significant bleeding but without major haemorrhage if they have abnormal coagulation test results (for example, prothrombin time ratio or activated partial thromboplastin time ratio above 1.5).	November 2015
Do not offer cryoprecipitate transfusions to correct the fibrinogen level in patients who are not bleeding and are not having invasive procedures or surgery with a risk of clinically significant bleeding.	November 2015

Indications, Triggers and Targets

The indications and contraindications for individual blood components are documented within the component specific Trust policies, found on the intranet.

These policies also contain information on appropriate thresholds and dosage.

5.3 Prescribing Blood components

Prescription of blood and blood products is the responsibility of a doctor or authorised non-medical prescribers (who have undertaken appropriate education and assessment as authorised by HTC) and must take into account Trust polices on use of the individual components, the Maximum Surgical Blood Order Schedule and patients who refuse blood transfusion.

For each transfusion the following factors should be considered:-

- Does the patient need a transfusion?
- Have we considered all other alternatives?
- Has the patient consented to transfusion (see section on consent & information for patients below
- Does the patient have special requirements? E.g. Irradiated components
- Is the patient at risk of fluid overload?
- Are diuretics needed and prescribed?
- Transfusion History. It is **vital that any recent transfusion history,** especially at another hospital, is communicated to the Transfusion laboratory.
- Does the patient have any history of transfusion reactions?

It is recommended that routinely only 1 unit of red cells is prescribed at a time, and that we do not give 2 without review, i.e. the patient should be reviewed between each unit and only then the decision for any further units should be made.

A Full Blood Count (FBC) can reflect increments in haemoglobin (Hb) within approximately 30 minutes after the end of a transfusion.

All blood components MUST be prescribed using the Trust's blood component prescription chart. The prescription must include the following details:

- The product to be given
- Any special requirements (e.g. irradiated, CMV negative).
- The quantity to be transfused (i.e. either the number of units, or for children, neonates and patients of very low body weight, an accurate calculation of the volume required).
- Duration of transfusion of each unit.
- Any special instructions (e.g. use of a 'blood warmer' for patients with cold agglutinin disease, medications required to 'cover' transfusion).

To ensure clarity of the prescription the following names of products and abbreviations are acceptable:

Name/ Abbreviation	**Expansion**
HAS	Human albumin solution
Platelets	Platelets
Blood/red cells	Red cells
FFP	Fresh Frozen Plasma
Cryo	Cryoprecipitate
Anti D	Anti D

Prescription and administration of medications to 'cover' transfusion of blood products

Doctors and Nurses/ Midwives with NMC registration are responsible for the administration of any medications prescribed to be given at the time of transfusion e.g. hydrocortisone and piriton to prevent febrile transfusion reactions, desferioxamine in patients with iron overload, diuretics to reduce risk of pulmonary oedema etc. These must be prescribed on the patient's main prescription chart, in the 'as required' or 'once only' medication section.

Special requirements

When a patient's need for special requirements is first identified, the laboratory must be notified immediately. An "Irradiated and Specialist Components Communications Document"

(appendix 2) must be fully completed and sent to the laboratory to ensure the patient record is updated. This is usually completed by the Haematology Specialist Nurses. Once records are updated in the laboratory, the form will be returned as confirmation of receipt and completion.

An “Irradiated and Specialist Components Communications Document” (appendix 2), should also be completed for patients commencing on Daratumumab (along with appropriate additional pre-drug testing) as it can interfere with cross match testing for up to six months after administration of the drug.

The notification form is a shared care document and if the patient is also being treated at another hospital the name of this hospital should be included as the form will be sent on to the shared care hospital, by laboratory staff, for their records.

Details of the clinical condition that requires the special requirement should also be included on the Transfusion Request form.

Irradiated blood products

Irradiated blood products are given to prevent a rare complication of transfusion called Transfusion Associated Graft-versus-host disease (TA-GvHD). Residual donor lymphocytes in the transfused blood component that are compatible with the recipient, but which recognise the recipient as foreign can engraft and initiate TA-GvHD. Patients develop skin rash, diarrhoea and abnormal liver function and deteriorate, with bone marrow failure and death from infection usually within 2-3 weeks of transfusion.

TA-GvHD can be prevented by irradiating cellular blood components to be transfused, using gamma or X-rays, since this inactivates the donor leucocytes. Please note that irradiated blood may also be used for any transfusion patient in order to aid laboratory stock control.

Patients requiring irradiated blood should be given an information leaflet and card informing them about their need for irradiated blood components and that they should make clinical staff aware of this.

Please refer to the trust policy for use of irradiated blood products C0662, and the British Standards in Haematology (BSH) guidelines on the use of irradiated blood components for further advice or information.

CMV seronegative blood components

Cytomegalovirus (CMV) is a member of the herpes virus group, which includes herpes simplex and varicella zoster. These share the ability to remain dormant within the body for long periods.

CMV is transmissible by transfusion of blood products. Severe impairment of the immune system by medication or disease may reactivate the virus from its latent state to cause clinical disease which may be fatal. All blood products apart from granulocytes are now routinely leucocyte depleted which effectively reduces CMV transmission.

Indications for the use of CMV seronegative blood components

The following patients should receive CMV negative blood products:

All pregnant women
All recipients of intra-uterine transfusions.
All neonates up to 28 days post expected date of delivery.

For further information regarding CMV negative blood components please see the policy C0661 on the intranet

Hepatitis E Negative components

All products provided by NHS Blood & Transplant are now HEV negative, and so there is no longer a need to specify HEV negative requirements.

Information for Patients & Consent

The NICE Guideline for Blood Transfusion (2015) states that patients who may have or who have had a transfusion, and their family members or carers (as appropriate), should be provided with verbal and written information explaining:

- The reason for the transfusion.
- The risks and benefits.
- The transfusion process.
- Any transfusion needs specific to them.
- Any alternatives that are available and how they might reduce their need for transfusion.
- That they are no longer eligible to donate blood
- That they are encouraged to ask questions.

The National Blood Service has produced a patient information leaflet – 'Will I need a Blood Transfusion', which covers much of this information, and so this should be offered to the patient as appropriate.

In addition, the National Blood Service have produced a number of other patient information leaflets – all of which are available in the relevant clinical areas or from the Transfusion Practitioners, including:

- *Information for patients needing irradiated blood.*
- *Anaemia.*
- *Information for patients who have received an unexpected transfusion.*
- *Blood groups and red cell antibodies in pregnancy.*
- *Iron in your diet.*

These leaflets may also be downloaded from the following website

https://hospital.blood.co.uk/patient-services/patient-blood-management/patient-information-leaflets/

Patients have a fundamental, legal and ethical right to determine what happens to their own bodies. Valid consent to treatment is, therefore, absolutely central in all forms of healthcare, from providing personal care to undertaking major surgery. Seeking consent is also a matter of courtesy between health professionals and patients.

This should be considered in conjunction with the Trust Consent Policy.

Consent should be obtained wherever it is feasible to prior to a transfusion. This should include pre-operatively and prior to planned procedures where there is a bleeding risk (such as childbirth).

Consent can be formal written (usually as part of consent form for a procedure) or verbal, dependent on the situation. Verbal consent must always be documented, and preferably witnessed. Thus, any discussion must be documented in the patient's notes.

Occasionally a situation will arise where the need to transfuse is immediate, yet the patient is unable to be consented at that time, for example an unconscious patient. A lack of formal consent in this instance should not stop us administering blood, as administration is given in best interests to preserve life. However after the event the patient should be informed of the transfusion, and given any appropriate patient information leaflets.

Consent for blood transfusion in paediatrics should follow the same principles as consent for any procedure. Thus please follow the paediatric consent policy.

A patient reserves the right to change their mind at any time, and thus can withdraw consent, this should be documented and any products returned to the lab as soon as possible.

When a patient refuses a transfusion, the decision making process should be fully documented in the patient's notes. Staff involved should discuss the reason for refusal of the proposed treatment and ensure that the patient understands the risks and benefits of transfusion, the alternatives, and the possible consequences of refusing transfusion, including possible death. Please refer to the section on "Patients who Refuse Blood and Advance Decision Notices" for further information.

5.4 Alternatives to Transfusion & Blood Conservation

Haematinic Replacement

The cause for any documented anaemia found should be investigated. When Iron deficiency or Vitamin B12 deficiency is the cause of the anaemia, patients should receive appropriate haematinic replacement as the first line treatment unless they are otherwise compromised.

Iron therapy

Iron is the appropriate treatment for iron deficiency anaemia and red cell transfusion is not indicated unless iron treatment is contraindicated or unsuccessful. The Department of Health recommends timely pre-operative assessment of iron status, in order to allow optimisation of haemoglobin levels prior to elective surgery.

NICE (2015) recommend that oral iron should be offered before and after surgery to patients identified to have iron-deficiency anaemia.

Patients with iron deficiency anaemia who have issues with intolerance or mal-absorption of oral iron can be referred for intravenous Iron therapy.

Therefore, consider intravenous iron before or after surgery for patients who:

- Have iron-deficiency anaemia and cannot tolerate or absorb oral iron, or are unable to adhere to oral iron treatment
- Are diagnosed with functional iron deficiency.
- Are diagnosed with iron-deficiency anaemia, and the interval between the diagnosis of anaemia and surgery is predicted to be too short for oral iron to be effective.

Intravenous iron can also be given in conjunction with erythropoietin to optimise haemoglobin pre-operatively in patients who refuse blood.

Erythropoietin

Human erythropoietin is a glycoprotein hormone produced in the kidney. It stimulates red cell production by the bone marrow (erythropoiesis).

Indications for erythropoietin include treatment to prevent and treat anaemia in cancer patients, and treatment for patients suffering with chronic renal disease. It is also used to optimise haemoglobin pre-operatively in patients who refuse blood. Further guidance on the indications and use of erythropoietin should be sought from a consultant haematologist.

Tranexamic Acid

Tranexamic Acid is an anti-Fibrinolytic, and can be given IV or orally. Oral should be reserved for chronic bleeding (such as Menorrhagia). Acute bleeding should be treated with Intravenous Tranexamic acid.

Tranexamic acid should be considered with any expected blood loss >500mls.

Additionally, Tranexamic acid should also be considered for adults undergoing surgery who are expected to have at least moderate blood loss (greater than 500 ml).

Consider Tranexamic acid for children undergoing surgery who are expected to have at least moderate blood loss (greater than 10% blood volume).

Consider intra-operative cell salvage in conjunction with Tranexamic acid for patients who are expected to lose a very high volume of blood (for example in cardiac and complex vascular surgery, major obstetric procedures, and pelvic reconstruction and scoliosis surgery).

Intraoperative Cell Salvage (IOCS)

Intra operative cell salvage is a procedure where blood lost during surgery is collected, washed and then transfused back to the patient during or shortly after surgery.

Intra operative cell salvage can be used in different types of surgery.

The Procedure for Intra operative cell salvage can be found on the intranet.

Vitamin K and Prothrombin complex concentrate (PCC)

Complete and rapid reversal of over anticoagulation is more readily achieved with a factor concentrate (PCC). Guidelines for the use of PCC can be found on the on the intranet.

Vitamin K must be given at the same time as Prothrombin complex concentrate.

FFP should not be used for the reversal of warfarin.

5.5 Patients who refuse blood & Advance Decision Notices

Patients may refuse blood/blood components for a variety of reasons; staff should enquire as to the wishes of the patient and identify respects in which these will affect treatment. A detailed account of discussions should be documented in the patient's records with a clear management plan available to all staff involved in the patient's care.

A documented advanced decision for refusal of transfusion is vital in establishing specifically what a patient will and will not agree to. The reason for refusal may be very diverse, however the reason for refusal is irrelevant and discussion should be limited to acceptability of different treatments.

The general rule is that any adult (18 years of age or over) with mental capacity can refuse any form of treatment, including a blood transfusion. It does not matter whether there is any logical reason for such a refusal.

If the patient lacks mental capacity and there is a valid advance decision or directive in existence which states that a blood transfusion is not to be given then this should be adhered to unless there is a proper reason not to do so. The Trust policy on advance decisions should be consulted (0370); this is available on the intranet.

It is possible that transfusion of a patient, without his or her informed consent will constitute an assault and battery. The legal services department must be consulted if there are any concerns as to whether or not transfusion may be performed.

It is important to remember that a patient can change their mind at any stage. Just because a patient may have refused a transfusion at an earlier stage does not mean that he/she is refusing a transfusion at all future times, especially in a life or death situation.

If the patient requires a procedure and all options have been explored to optimise the patient and utilise alternatives to transfusion, but either the surgeon or the anaesthetist is unhappy to proceed because of haemorrhagic risk, the patient must be referred to a team who is willing to take on the case.

The Trust has separate policies for: consent to treatment (including adults and children), the treatment of patients who may refuse blood component transfusion, for example members of the Jehovah Witness faith, and women who refuse blood and blood products in pregnancy, labour and the puerperium. These can be found on the Trust Document library.

If there is no time to take legal advice, the situation is life threatening and a delay in blood transfusion might be fatal; clinicians must act in the patient's best interests. Ideally the decision to give blood in these circumstances should be made by two consultants. The reasons for the transfusion must be fully documented in the medical records.

If anyone has any questions or concerns regarding consent to treatment, or withholding of consent, these must be discussed with the legal services department- contact details are available on the intranet.

The legal services department can be contacted out of hours via switchboard.

The legal services department must be contacted if a declaration from the Court is required.

5.6 Requesting blood components and sample requirements

Blood product requesting

The general principles for requesting blood are described below, however please refer to the Trust Policy on the Management of Major Haemorrhage for more specific instructions on obtaining blood components for massive blood loss.
Firstly

- Ensure you are dealing with the correct patient
- Decide which product(s) they require and when they are required.

Hinchingbrooke Hospital	Peterborough City Hospital
Make a hand-written request giving clinical details and noting any special requirements (e.g. irradiation, CMV negative).	Make a request via ICE giving clinical details and noting any special requirements (e.g. irradiation, CMV negative).
If unsure whether a new Group and Save (G&S) sample is required, contact transfusion	
Send the request (and any required G&S sample(s)) to the laboratory.	
If the request is urgent/ for an emergency contact the on call Biomedical Scientist (BMS) on x6157	If the request is urgent/ for an emergency contact the on call Biomedical Scientist (BMS) on bleep 1151

Timing of Sample Collection

Transfusion or pregnancy may stimulate the production of unexpected antibodies through either a primary or secondary immune response. The timing of samples selected for compatibility testing must take account of this, as it is not possible to predict when or whether such antibodies will appear. Furthermore, the assessment of patients prior to a transfusion must include their transfusion, transplant and pregnancy history.

When the patient has been transfused or pregnant within the preceding 3 months:

To ensure that the specimen used for compatibility testing is representative of a patient's current immune status, serological studies should be performed using a sample collected no more than 72 hours in advance of the actual transfusion.

A formal deviation from the 72 hour rule, allowing samples to remain acceptable for up to 7 days will be considered when blood is required on stand by for potential obstetric emergencies, e.g. placenta praevia. Fetomaternal haemorrhage (FMH) constitutes a smaller stimulus than transfusion, because the number of foreign antigens is limited, and in many pregnancies the volume of red cells transferred from foetus to mother is too small to stimulate a primary response. In such cases a Concessionary release form (obtainable from the Trust intranet and in appendix 7 to this policy), completed and signed by the consultant obstetrician caring for the patient, should accompany the transfusion request for blood.

When the patient has never been transfused or pregnant, or was transfused/pregnant greater than 3 months previously:

In these cases Group & Save samples are valid for longer than 72 hours because the patient will not have recently been exposed to the potential to create red cell antibodies. In Summary:

Patient transfused/previous pregnancy:	**Sample validity:**
Never	Up to 7 days (**PCH only** up to 28 days but practice is currently under review)
Transfused/pregnant less than 3 days ago	Up to 72 hours after commencement of the first unit
Transfused/pregnant between 3 days and 3 months ago	72 hours (*i.e.* 3 days)
Transfused/pregnant over 3 months ago	Up to 7 days (**PCH only** up to 28 days but practice is currently under review)
Currently Pregnant, *without* an obstetric concessionary release form	72 hours (*i.e.* 3 days)
Currently Pregnant, with an obstetric concessionary release form	7 days

Confirmation of Blood Group

National guidelines state that if the transfusion laboratory system does not have a record of the patient's ABO blood group, two Group & Save samples must be obtained to ensure the patient is assigned the correct blood group prior to transfusion. The process of collecting two separate samples has been proven to reduce the occurrence of Wrong Blood in Tube (WBIT) incidents and the risk of ABO incompatible transfusions.

If a patient has been tested historically, and the laboratory has their blood group on record, this is acceptable as a confirmation sample and only one current sample is required.

If a confirmatory sample is required it MUST be taken by a separate venepuncture from the first sample ideally:

By two DIFFERENT staff members by separate venepunctures, one member of staff taking the first sample and the second independently taking the confirmatory sample
Or if clinical urgency dictates (for example life threatening haemorrhage):

- By the same staff member by separate venepunctures at DIFFERENT times
- By two DIFFERENT staff members, independently but at the same time (for example from different venous access points)

The laboratory will accept labelling of the samples at different times, or by different staff members, as your guarantee of compliance with this policy. **Intentional by-passing of this patient-safety measure may have severe or possibly fatal consequences for the patient, and could also result in serious professional consequences for all the staff involved.**

In an emergency, blood will always be available, either as emergency Group O or, Group O blood issued to the named patient, until a confirmatory sample has been tested.
If possible, at least one Group & Save sample should be collected prior to commencement of any transfusion, to avoid transfused red cells affecting the results of testing, and complicating the issue of further components.

To determine if your patient requires a confirmatory sample:

Hinchingbrooke Hospital	Peterborough City Hospital
1. Contact the laboratory who will check their laboratory system for you.	1. Check the patient's record on ICE. If a Blood transfusion report exists with a documented blood group, a confirmatory sample will not be required.
	2. Contact the laboratory who will check their laboratory system for you.

If the laboratory receives an urgent crossmatch request, for which a confirmatory sample is required but has not been received, the requesting area will be contacted to advise that a second sample is required.

If further testing is required for any reason (e.g. Antibody identification) the laboratory may request the collection of further samples. These samples may be tested in-house, or may require referral to a specialist reference centre, depending on the complexity of the testing.

Specialist Investigations & Concessionary Release of Blood Products

Occasionally, the results of standard, hospital transfusion testing (Blood Group and Antibody Screen) results in the requirement to obtain further samples for referral to specialist testing laboratories for further investigations. Such results (i.e. the presence of antibodies in the patient's sample) can cause delays in provision of compatible blood components; the length of the delay is influenced by the antibody specificity/specificities present and the availability of suitable blood components on site.

Rarely, the presence of some antibodies (e.g. pan-reactive auto-antibodies) can result in the situation where fully compatible units cannot be provided. In such cases, the hospital laboratory will require samples for urgent referral to NHSBT for specialist investigations and crossmatching. Should the urgency of the transfusion be such that the patient cannot wait for crossmatched units from NHSBT, units crossmatched locally and found to be "suitable" rather than "compatible" may be issued under concessionary release with authorisation from a Consultant Haematologist. These units should only be transfused when the clinical benefit of the transfusion outweighs the risk of harm to the patient. The patient should be monitored particularly closely for signs and symptoms of a transfusion reaction during these transfusions.

Specimen requirements

Venous Blood taken into:

PCH- red top EDTA sample, 7.5 ml for adults, 3.4ml children.
HH- Blue top EDTA sample 4.9ml for adults and for children (unless child is difficult to bleed, then 1.3ml)

PCH-For neonates < 6 months old, a heel prick sample is needed for grouping but a 7.5ml EDTA is also required from the mother.

HH- 1.3ml red top EDTA and mothers sample if not currently available already

The specific number and type of samples required for the range of tests carried out by the transfusion laboratory can be found in the Pathology Handbook.

In extreme circumstances, if the only option to obtain blood is through an intraosseous sampling method, the laboratory MUST be notified of the sample type. There is no guarantee that valid results will be obtainable from such samples, and blood issued will be on a group-compatible basis only.

Sample Acceptance Criteria

The Serious Hazards of Transfusion (SHOT) report highlights the danger of incorrectly labelled samples, and has identified this as a particular area of concern. SHOT states that when labelling samples it is essential to have positive patient identification (from the ID band and by verbal confirmation where possible) however familiar the patient, and that all sample tubes must be labelled at the patient's side.

Labelling of the specimen must be BY HAND. Printed labels will not be accepted by the transfusion laboratory.
NEVER pre-label bottles, or take unlabelled samples away from the patient.
When in doubt, or if interrupted, start the venepuncture again (ring the laboratory if necessary).
Collect specimens of blood by venepuncture away from any intravenous infusion sites.
Sample details must match those on the request form, and, for inpatients, the patient ID band.
To be accepted for testing, the following information MUST be included:

On the Request form	On all Patient samples
Full Surname	Full Surname
Full Forename(s)	Full Forename(s)
Date of birth	Date of birth
Hospital/NHS number	Hospital/NHS number
Ward/Location/Consultant	Ward/Location/Consultant
Clinical details	Signature
Special Requirements	Date and time bled
Signature and bleep/ext. number of requestor	

In an emergency, patients who cannot be identified must be allocated patient demographics according to the Emergency Department's Standard Operating Procedure, using the phonetic alphabet (e.g.: Alpha Bravo) and have these applied to all request forms and samples. Ideally, this name should be continued to be used whilst the patient remains within the emergency department to enable continuity of care, without the need to retake samples.

The transfusion laboratory will reject any sample which is incorrectly labelled,
If the information provided is inadequate or ambiguous the sample will not be processed and will be reported as rejected. Additionally, a DATIX clinical incident record may be generated so that the requesting area can investigate how the mislabelling has occurred.
If the sample is urgent the requesting location will be contacted to provide a repeat sample.

These measures are designed to protect the patient from dangerous consequences of lapses in established procedures. No difficulty should arise if the transfusion request form is filled in correctly and the sample is adequately labelled.

5.7 Blood Component Collection and Movement

Access to blood components

Access to all NWAFT blood fridges is controlled and monitored. Access to the main Blood Banks is controlled by swipe card access. Access to remote satellite fridges is monitored and competency records checked.
Blood and blood products MUST only be removed from a blood bank/fridge by members of staff who have completed a competency assessment in handling and collection of blood. The policy for competency assessment for staff (C0175), and competency assessment forms are available on the intranet.
Collection of units for immediate patient use is not a portering responsibility. However, at Peterborough City Hospital porters may move blood between satellite fridges and may transport blood to the Emergency Department in a suitable transport box, including emergency O RhD negative blood in an urgent/emergency situation. The staff member requesting this MUST provide the porter with full and correct patient information to enable this to be completed.

Pre collection checks
Before collecting the blood component, the following should be ensured by clinical staff:

- The patient is wearing an identification band.
- The reason for the transfusion has been documented in the medical notes.
- Wherever possible, that the risks benefits and alternatives to transfusion have been discussed with the patient (and/or for paediatric patients those with parental responsibility), that there is a record of this is in the notes and consent obtained.
- The blood component has been prescribed on an approved prescription chart and any special requirements noted.
- There is appropriate and patent intravenous access.
- There are suitably trained and competent staff available to care for the patient for the duration of the transfusion.
- The patient's baseline clinical observations (temperature, pulse, blood pressure, and respiratory rate) have been completed.

Removing blood components for immediate patient use

Units should only be collected one at a time In situations where multiple units may be required simultaneously, or in rapid succession (for example in the emergency Department) arrangements must be made with the laboratory to issue blood in a suitable transport box (see Appendix 3)

Only collect units when it is intended to begin administration within 30 minutes.

Take the patient's blood product prescription chart (which contains the patient's full name, date of birth, hospital number and component type to be collected) to the blood fridge.
If the prescription chart cannot be taken away from the clinical area due to urgent care, other printed documentation containing the patient's full name, date of birth and hospital number may be used in these circumstances.

Locate the patient's transfusion compatibility reports, which are kept in the folder adjacent to the refrigerator.

Check that the patient's details (full name with correct spelling, date of birth and hospital number) on the prescription chart / printed documentation match the patient details on the compatibility report. Any differences must be reported to the transfusion laboratory immediately.

Preferably, use units in the order they have been issued on the compatibility report.

Note the donation number of the next available unit to be used. Locate and remove only that unit from its temperature controlled storage.

Blood product	Hinchingbrooke Hospital	Peterborough City Hospital
Red cells	Blood fridge	Blood fridge
FFP	Blood fridge	Blood fridge
Cryoprecipitate	Platelet Agitator	Platelet Agitator (Main blood bank only)
Platelets	Platelet agitator	Platelet Agitator

		(Main blood bank only)
HAS/Anti-D/Octaplex etc	Blood Bank	Blood fridge
Granulocytes	Obtain directly from staff from within the laboratory	

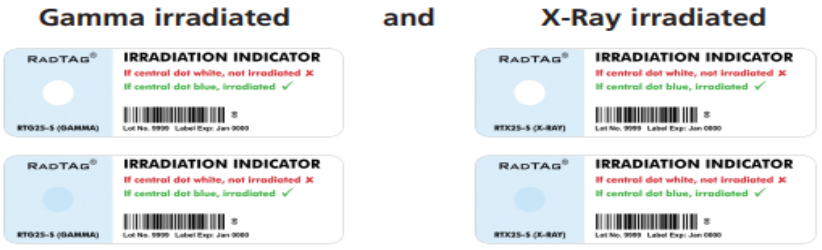
Close the door of the storage unit immediately, to maintain temperature control.

Check the details on the compatibility tag attached to the unit, agree with those on the compatibility report and prescription chart/ printed documentation paying specific attention to:

- Patient's full name (including correct spelling).
- Hospital Number.
- Date of Birth.
- Unique component pack donation number.
- Blood Group (if units of a different but compatible group to the patient's own have been issued, the laboratory will make it clear on the compatibility form).
- Expiry Date (units must be commenced before midnight on the expiry date).
- The general condition of the unit e.g. Signs of leakage, discolouration, presence of clots.
- Any special requirements e.g. CMV negative or irradiated.

CMV negative units have this indicated on the label on the front of the unit.

Irradiated units have a Rad-Tag label attached to the front of the unit (see below).



The label is attached to the blood component prior to the irradiation process. If you can see the white dot in the centre of the blue square – do not use and return to the Hospital Transfusion Laboratory.

Check that the unique component donation number on the front of the unit matches that on the laboratory produced compatibility tag attached to it.

If all details agree, sign, date and time all copies of the compatibility report. If they do not agree, do not take the unit, and inform the transfusion laboratory immediately.
The unit must be taken directly to the patient location. Red plastic bags are provided for safe transport of individual units to the clinical areas, to allow the unit to be carried securely, avoid hazardous spillages if accidentally dropped, and to protect confidentiality.

Collection of Emergency O RhD Negative Blood

IMPORTANT

The Blood Transfusion laboratory must be informed immediately if you are taking any emergency blood so that replacements can be organised.

Emergency O RhD Negative blood should only be used in **life threatening** situations, when the patient's condition indicates that there is no time to wait for group specific blood. In situations of major haemorrhage, reference should also be made to the trust policy 'Management of major haemorrhage' (C0185).

Group O Rh D Neg / Positive or Group specific blood is normally available within **15 minutes** of the laboratory receiving a sample, and fully cross matched blood within **50 minutes**, if no significant antibodies are detected.

Samples for cross match should be taken before transfusion of the emergency O RhD negative blood is commenced.

There are units of emergency O RhD negative available in the blood fridges at:-

Hinchingbrooke Hospital	Peterborough City Hospital Please note: There are no emergency O RhD negative units in the Stamford Hospital blood fridge

Main blood bank (Ground floor, Pathology Dept) 2 Adult units 2 Neonatal units	Main blood bank (4th floor Core B) 2 Adult units
	Main Theatre blood fridge (1st Floor) 3 Adult units 2 Neonatal units

Adult O RhD negative units MUST NOT be used for neonates, unless advised by laboratory staff.

Emergency O RhD negative units are clearly labelled with either “Adult” or “Neonatal” tags stating they are for emergency use.
Under no circumstances must any other O RhD negative units in the fridge be used.

When taking the emergency O RhD Negative units:-
Sign the compatibility report located with the unit(s) and put the date & time the blood was taken.

As soon as possible, confirm use of the unit by completing the traceability tag attached to the unit with the patients name and hospital number, and return it to the transfusion laboratory. This information is essential to ensure the laboratory can update the transfusion history for the patient, and to comply with the law on traceability of blood components.

There are no emergency O negative units at Stamford Hospital Blood Bank.
In case of major haemorrhage at Stamford Hospital, arrangements should be made to transfer the patient to PCH immediately by emergency ambulance. Give crystalloid/ colloid fluids to support the patient’s circulation. Transfusion at PCH should be contacted on 8451/2 or bleep 1151 out of hours to inform them that the patient is being transferred to PCH (they may need transfusion support on arrival).

Movement of components within PCH (including fridge to fridge)
Whenever movement of issued components is required, all available units listed on the compatibility report MUST be moved together.
The transfusion department staff issuing the unit(s) will have completed the first line of tracking log on the compatibility form, with their name (signed & printed), the date & time of issue, and blood bank location the units were issued to.
All copies of the compatibility reports associated with those units must accompany them to their next storage location. The tracking log on the compatibility report MUST be completed for every movement of the unit(s). This will result in 2 entries per movement e.g. the removal from one location and the entry into the new location.
Completion of each tracking entry must include the name (signed & printed) of the person moving the blood, the date & time of movement of the unit(s), and the location moving from or to.
The unit(s) should be transported in a red transport bag.
When the unit(s) arrive at their destination, refrigerated products must be placed into the fridge. The compatibility report(s) must be completed as above and filed appropriately next

to the blood fridge. Non refrigerated products must be taken directly to the clinical area, and handed to an appropriate member of staff, who should sign the front of the of the compatibility report as a receipt.
If a blood fridge is marked as “Out of Use” blood products MUST NOT be stored within it. If you reach a blood fridge and find this is the case, or it has an active temperature alarm, contact the transfusion laboratory immediately for advice. Furthermore, blood fridges are subject to strict temperature mapping rules, and areas within a working fridge may be isolated as unsuitable for component storage. DO NOT place any products within restricted areas of blood fridges.

Movement of components within the Hospital (fridge to fridge)
Movement of blood products must only be undertaken by staff who have been trained, and use of the satellite fridge (located in main theatres) is restricted to theatre and delivery staff. Please note the fridge should only be used for blood and appropriate products on a NAMED PATIENT BASIS only. The satellite fridge should not be used for the routine storage of the emergency O Negative units
Whenever movement of issued components is required, all available units listed on the compatibility report MUST be moved together.
The collection slip should be signed, dated and timed on the BACK of the form, including time removed from main blood bank.
All copies of the compatibility reports associated with those units must accompany them to the satellite fridge
The unit(s) should be transported in a red transport bag, if available
Once placed into the satellite fridge the back of the collection slip should be completed including the name (signed & printed) of the person moving the blood, the date & time of placement in the fridge.
The collection slip should then be placed in the receptacle next to the blood fridge, for reference when the blood is removed to go to the patient.

If a blood fridge is marked as “Out of Use” blood products MUST NOT be stored within it. If you reach a blood fridge and find this is the case, or it has an active temperature alarm, contact the transfusion laboratory immediately for advice. Furthermore, blood fridges are subject to strict temperature mapping rules, and areas within a working fridge may be isolated as unsuitable for component storage. DO NOT place any products within restricted areas of blood fridges.

Transport of Components outside the Hospital
This section covers both:
The routine movement of blood components to sites that the PCH transfusion laboratory supply e.g. Stamford & Rutland Hospital, Thorpe Hall Hospice, Fitzwilliam Hospital, Healthcare at Home.
The urgent provision of blood components to accompany a patient transfer to a specialist hospital.

For stock transfer of any units between sites, please refer to the relevant lab SOP’s.

If a patient is to be transferred out of the hospital with blood products, the transfusion laboratory **must be contacted immediately** to package and label the products to maintain viability in accordance with the relevant laboratory SOP and **under no circumstances** must components leave the hospital without prior secure packaging by the transfusion laboratory.

Only **2** units of Packed Red Cells will be issued for transfer, providing that there is both a clinical need, and appropriately trained staff to check and administer the blood in transit. If the requesting doctor feels that there is a clinical need for more than 2 units of Packed Red Cells, then authorisation must be obtained via the on-call haematologist. The maximum number of units per transport box is 2, so if more than 2 units are requested, this will require use of multiple boxes.

To maintain the integrity of the cold chain, the transport boxes are sealed, and to avoid unnecessary waste of a precious resource, **boxes must not be opened until the blood is to be used**. Once opened, any units in the box not used will need to be disposed of

In exceptional circumstances, or where atypical antibodies may delay the availability of blood at the receiving hospital, more than 2 units may be packaged and issued as deemed appropriate by the lab.

When the unit(s) arrive at their destination, refrigerated products must be placed into the blood fridge, and the tracking log on the compatibility report must be completed (name, date and time of arrival, and location of the fridge). The compatibility report(s) and filed appropriately next to the blood fridge.
Non refrigerated products must be taken directly to the clinical area, and handed to an appropriate member of staff, who should sign the front of the compatibility report as a receipt.
Blood component transport boxes have a maximum transport time, which will be documented on the outside of the box and must be adhered to. If the storage time has been exceeded the components within MUST NOT be used. Seek advice from the transfusion laboratory.

5.8 Administration of Blood Components

Pre transfusion checks -The 'bedside check'
The Serious Hazards of Transfusion (SHOT) report has identified the final 'bedside check' as vital in preventing the incorrect component being transfused to the patient, which could have serious, even fatal, consequences. It is essential that the following checks are performed, before every unit of blood/ blood component is commenced, **without exception**.

The bedside check must be completed **independently** by two registered healthcare practitioners, at least one of which has a permanent contract with the trust and must have attended a transfusion update and completed the trust competency assessment in caring for a patient having a transfusion

The registered healthcare practitioners must:-

- Confirm that the patient's full name, date of birth and hospital number on the prescription chart, tag attached to the unit of blood and ID band match exactly.
- Check that any special requirements documented on the prescription chart (e.g.: irradiated, CMV) match those on the blood component collected.
- Conducted a visual inspection of the component for any leaks or discolouration and check its expiry and de reservation date.

- If appropriate to the patient's age or clinical condition, using open questions (i.e. ask "what is your name" and "what is your date of birth") to confirm the patient's identity, and check this information against the prescription chart, ID band and tag attached to the unit.
- Check that the blood group of the unit is the same as, or compatible with, the patient's own blood group (See Appendix 4 for blood component compatibility). Additionally, the laboratory will add a comment to the compatibility report if a suitable unit of a compatible group has been issued.
- Check that the unique component pack donation number on the unit matches that on the tag attached by the transfusion laboratory.
- Check the product type to ensure that the correct component was being given e.g.: platelets, FFP etc.
- Check the rate and volume of the infusion and whether any medications are to be administered alongside the transfusion. Please see the table in appendix 5 for information on component infusion rates. If an infusion pump is being used to administer the component, the device and settings must also be checked.
- Checked that the component had been commenced within 30 minutes of removal from temperature controlled storage. If the component has been out of temperature controlled storage for greater than 30 minutes, contact the transfusion laboratory for advice.

If any discrepancies are found during the above checks, DO NOT commence the transfusion, but contact the Transfusion Laboratory immediately. Any inconsistencies must be clarified prior to proceeding with the transfusion.

If all the details are confirmed, both registered healthcare practitioners should sign the prescription chart to confirm the bedside check has taken place. The date and time that the transfusion commenced and the unit number should also be entered on the prescription chart.

Administering Blood Products

Blood products must only be administered by a Registered Healthcare Practitioner, who has completed the trust IV drug administration assessment appropriate to their area. Staff involved in caring for the patient must also have completed the trust competency assessment in caring for a patient having a transfusion.

For information on the care of intravenous infusion sites, and the administration of intravenous drugs, please refer to the Trust document Policy and assessment for the administration of IV drugs C0019 available on the intranet.

Although most transfusions are given through a peripheral venous cannula, venous access via short term or indwelling multi-lumen central lines may be used. One lumen should be reserved for administering blood components. When multi-lumen central venous access devices are used it is generally safe to co-administer other therapeutic solutions through a different lumen as rapid dilution occurs in the bloodstream. Peripherally inserted long central catheters (PICC lines) with narrow lumen diameter may lead to slower flow rates.

In exceptional circumstances an intraosseous transfusion may be necessary.

It is essential that blood products are NEVER removed from the donor bag, but remain within a closed system for infusion, to prevent contamination.

There is no recommended gauge of cannula to be used for blood transfusion. The size of the cannula chosen depends on the size of the vein, and the speed at which the blood is to be transfused.

All blood components should be transfused through a blood component administration set with an integral mesh filter (170-200 micron). The administration set should be changed at least every 12 hours or after every second unit of red cells. This is intended to reduce the risk of bacterial growth occurring. A new giving set must be used for each unit of platelets.

Human Albumin Solution (HAS) may be given via a standard IV fluid administration set.

Please see the table in Appendix 5 for further information.

It is unnecessary to use any other intravenous fluid to prime the line; the intended blood/blood product should be used. It is also not necessary to 'flush' the blood administration set after transfusion. A new giving set should be used if blood components are followed by another infusion. This is intended to reduce the risk of incompatible fluids or drugs causing haemolysis of residual red cells in the administration set or drip chamber. The British Standards in Haematology (BSH) guidelines state that drugs must not be added to units of blood under any circumstances. In normal circumstances separate intravenous access should be established for blood and blood products if other I.V. therapy is to occur concurrently. Dextrose solution 5%, or Hartmanns solution, should never be used before or after blood as it causes lysis of red cells. Solutions containing calcium can cause citrated blood to clot.

The unit should be gently inverted and inspected for any leaks, clots or signs of deterioration prior to connecting to the giving set. Any units that are inadvertently pierced when being prepared for transfusion MUST NOT be used, but returned to the transfusion lab for replacement. If there are any concerns about the condition or appearance of the unit, it must be returned to the transfusion laboratory for inspection by a biomedical scientist.

Either gravity, or electronic infusion devices verified as safe for administration of blood components may be used to administer blood. Electronic infusion devices allow a precise infusion rate/ volume to be specified, and must be used for all paediatric and neonatal transfusions.

If an infusion device is used:

- The member of staff using the device should be able to demonstrate competency in its use.
- Only use a blood component administration set that is compatible with the infusion device (check manufacturers recommendations).
- The pre-administration checking procedure should include a check of the device and device settings.

The warming of blood is only indicated in certain circumstances:-

- Patients receiving large volume or rapid transfusion
- Infants undergoing exchange transfusion.
- Transfusing a patient who has significant cold agglutinins.

Blood should only be warmed in a specifically designed commercial device, with a visible thermometer and audible warning. Blood must never be warmed by improvisations such as

putting the pack into warm water, in a microwave, or on a radiator. Please contact the equipment library if use of a blood warmer is indicated.

External pressure devices make it possible to administer a unit of red cells within a few minutes. They should only be used in an emergency situation together with a large gauge venous access cannula or device.

External pressure devices should:

- Exert pressure evenly over the entire bag.
- Have a gauge to measure the pressure which must not exceed 300mm Hg.
- Be monitored at all times when in use.

Blood Administration rates

Please see the table in Appendix 5 for further information on rate of administration and giving sets to be used.

If transfusion is delayed or units are not used

If the decision is taken not to start the transfusion then INTACT units can be returned to the Blood Bank if done so **within 30 minutes**. The time of return must be noted on the compatibility report and the blood transfusion staff should be advised verbally. These units will be available for later collection if required.

If the decision not to transfuse is made **after 30 minutes** of the unit being collected, or after the unit has been opened or 'spiked', it must be returned directly to a member of laboratory staff, and NOT placed back into a blood fridge or disposed on the ward.

In all cases, please contact the transfusion laboratory, as soon as possible, for advice.

Overnight transfusion (defined as between 20:00 to 08:00)

Transfusions must be administered with the same attention to patient observations whatever the time of day or night.

Overnight transfusions must only proceed where there is a clear clinical indication that it is necessary to transfuse at night, and as long as the staffing is sufficient to permit the patient to be cared for according to the standards defined in the BSH guideline on administration of blood components (2009). These standards include adequate pre-transfusion assessment, observations at 15 minutes after the start of each component and regular visual observation throughout the transfusion.

Decisions to transfuse should not be made simply on the basis of the haemoglobin result, but taking into account the full medical history, the patient's current medical condition and the wishes of the patient. Junior medical staff should review the patient, consult the case notes and take advice from senior medical staff before deciding to transfuse at night, particularly when the team concerned are not familiar with the patient's case and are not responsible for the overall management plan.

Consideration should be given to transfusion of 1 unit to allay symptoms, with the remaining units being given the next day.

The reason for making the decision to transfuse at night, beneficial effects and any adverse incidents must be recorded in the medical notes.

Clinicians must also ensure that any blood results are reviewed in good time to enable products to be requested and transfused within daytime hours whenever possible.

Care of patients receiving Blood components

Location
Transfusion must only take place when there are enough staff available to monitor the patient and where the patient can be readily observed. If it is planned to transfer a patient between care settings (e.g. to another ward, department or hospital) a risk assessment must be performed to assess whether the transfusion should be delayed until the transfer is complete. If the patient has to be transferred with a transfusion in progress, they must be accompanied by a Registered Healthcare Professional, in case of adverse reaction during transfer.

Out of Hospital Transfusions
The information and guidance contained in the trust transfusion policy will also apply to out of hospital transfusions. In addition, the following must be considered
Out of hospital transfusion is for patients with an established diagnosis, such as:

- Haematological disorders
- Malignant conditions
- Patients who require regular transfusion and find it more convenient to have their transfusions in the community
- Patients must have had transfusions in hospital without adverse effect.

Patients are not suitable for out of hospital transfusion if they

- Are at higher risk of Transfusion Associated Circulatory Overload
- Require hydrocortisone or chlorphenamine (piriton) to be given with the transfusion

Monitoring and Clinical Observations
Observation and monitoring of the patient during a transfusion is essential if adverse reactions to the transfusion are to be quickly identified and managed.

Regular visual observation of the patient must take place throughout the transfusion episode. Patients should be informed of potential side effects to transfusion that they may experience. It is important to ensure that patients know to report feeling unwell or any potential symptoms of an adverse reaction (e.g. shivering, rashes, flushing, shortness of breath, pain at transfusion site, loin pain or feeling generally unwell) to the person caring for them immediately.

A means of attracting attention (i.e. a call bell) should be readily available for use by the patient as appropriate.

Special care should be taken for patients who are unable to report symptoms that would raise suspicion of a developing transfusion reaction, because they are unconscious / sedated, too young, confused or there is a communication barrier. For these patients, more frequent observations may be required.

A regular check should be made on the rate of transfusion to ensure that this is proceeding as prescribed.

As a **minimum**, the patient's temperature, pulse, blood pressure and respiratory rate must be measured and recorded:

- **Before** the start of each unit (no more than 1 hour before the unit commences)

- **15 minutes** after the start of each unit **and then as frequently as clinically indicated.** This standard is based on British Standards in Haematology (BSH) guidelines which state that the first set of observations after the start of the unit being transfused should be carried out at 15 minutes. However in clinical practice there is potential for neither the timing of, nor the recording of the timing of, the observations to be that precise. Therefore observations taken no more than 30 minutes after the start of transfusion, while outside the BSH guideline, are considered acceptable.
- **At the end** of each unit (no more than 1 hour after the unit finishes).
  If another unit is to follow, and there is no break in transfusion, these readings can be used as the pre transfusion observations check for the next unit.

Patients who are on continuous electronic monitoring must have the pre transfusion, 15 minute and post transfusion observations noted.

Inpatients should be observed for late reactions over the next 24 hours. Day care patients must be advised to report symptoms developing after discharge from hospital, and given a contact number for clinical advice.

Documentation of transfusion

The transfusion episode must be documented in the patient's notes. The blood product given, volume transfused, and commencement and completion times must be recorded on the blood prescription chart.
The outcome, or any adverse incidents associated with the transfusion should also be documented. A trust Blood Transfusion Care Plan is available.

Proof of transfusion is required by law (Blood Safety & Quality Regulations 2005) to be retained for 30 years.

If any or all of a unit is used the return section of the traceability tag must be completed and returned to the laboratory to provide this record. In the absence of the tag, a photocopy of the prescription and administration record must be provided.

Disposal of units on completion of the Transfusion

	Hinchingbrooke Hospital	Peterborough City/ Stamford Hospital
Transfusion complete	• Empty bags including giving set- dispose of the bag and giving set together in a sharps bin. • Empty bags without giving set can be	• Remove tag and place this in a confidential waste bin but PLEASE check the lower half has been removed and returned to Transfusion.

	disposed of in an orange or yellow waste bag.	• Empty bags without giving set - place in the red transfusion transport bag. • Empty bags with giving set - leave giving set attached and place everything in the red transfusion transport bag. • Keep all empty bags for 24 hrs then dispose of in tiger bag
Suspected reactions	• Return all bags and tags to Transfusion.	• Return all bags and tags to Transfusion
Transfusion stopped part way through (no suspected reaction)	• These should be disposed of in anatomical waste bins (red lidded). Small amounts (i.e. less than a quarter of a bag) may be discharged to sewer (i.e. down the sluice)	• Remove the tag and place this in a confidential waste bin, but PLEASE check the lower half has been signed and returned to Transfusion. • Leave giving set attached • Keep bag 24 hrs then dispose of into a sharps bin
Full bags out of fridge for >30 minutes	• Return to Transfusion • For reporting purposes, inform Transfusion why the unit was not administered (for example, out of fridge too long/ cannula problems/ patient refused)	• Return to Transfusion • For reporting purposes, inform Transfusion why the unit was not administered (for example, out of fridge too long/ cannula problems/ patient refused)

5.9 Transfusion reactions

To minimise the risk of harm, early identification of Transfusion reactions and rapid clinical assessment and treatment is essential. Please refer directly to the East of England Regional Transfusion Committee (RTC) flowchart on “Management of Acute Transfusion Reactions” which is associated document 1 alongside the Blood Transfusion Policy on the Trust document library.

Acute Transfusion reactions (ATRs) vary in severity from minor febrile reactions to life-threatening allergic, haemolytic or hypotensive events. Allergic and febrile non-haemolytic transfusion reactions (FNHTR) are those most commonly reported**.**

The initial clinical picture is also often obscured by factors related to the patient’s underlying medical condition, such as febrile septic episodes in neutropenic patients who also happen to be receiving a blood component transfusion so it is important to focus on initial recognition and general management of the clinical problem, guided in the main by symptoms and clinical signs and assessment of the severity of the

problem. This allows appropriate investigation, specific treatment and prevention, where possible, of future episodes.

Anaphylactic and haemolytic reactions can present after only a small volume of blood has been transfused however reactions can also present much later, sometimes several hours after completion of the transfusion. Therefore, observation and monitoring is required throughout the transfusion episode and patients should be asked to report symptoms which develop during the next 24 hours (BSH, 2009).

All patients should be transfused in clinical areas where they can be directly observed, and where staff are trained in the administration of blood components and the management of transfused patients, including the emergency treatment of anaphylaxis. (BSH 2012). Unconscious patients, or those unable to report symptoms, require direct monitoring.

Recognition and immediate management of acute Transfusion reactions (ATR)

Signs and Symptoms of acute transfusion reactions:

- Fever and related inflammatory symptoms or signs such as chills, rigors, myalgia, nausea or vomiting.
- Cutaneous symptoms and signs including urticaria (hives), other skin rashes and pruritus
- Angioedema (localised oedema of the subcutaneous or submucosal tissues), which may be preceded by tingling
- Respiratory symptoms and signs including dyspnoea, stridor, wheeze and hypoxia
- Hypotension
- Pain – loin pain, chest pain, muscle pain, pain at IV site
- Severe anxiety or feeling of impending doom
- Bleeding diathesis with acute onset
- Rapidly developing features of airway, breathing or circulation problems, usually associated with skin and mucosal change would suggest anaphylaxis.

If ANY of the above signs are observed:

- **STOP THE TRANSFUSION** and inform medical staff. Maintain venous access - do not remove the cannula.
- **Assess** – rapid clinical assessment of the patient (Airway Breathing Circulation).
- **Check** The patient's identity must be rechecked against the blood.
- **Inspect** the unit for turbidity, clots, or discolouration.

Management of a MILD acute transfusion reaction

This is defined as an isolated temperature of 38-39°C or rise of 1-2 °C from baseline, or pruritus/a rash only (see Management of Acute Transfusion Reactions in associated documents on Trust Intranet).

- Consider symptomatic treatment (e.g.: paracetamol/antihistamine).
- Monitor patient more frequently (TPR, BP, O_2 sats, urine output).
- Continue transfusion, but if symptoms worsen manage as for moderate transfusion reaction.
- Document in patient notes. Report to transfusion laboratory only if recurrent.

Management of a MODERATE acute transfusion reaction

This is defined as a temperature of 39°C or above or a rise of 2°C or more above baseline and/or other symptoms –but not pruritus/rash only (see Management of Acute Transfusion Reactions which is an associated documents to this policy on the Trust Intranet)

- Monitor the patient more frequently (TPR, BP, O_2 sats, urine output).
- Review patients underlying condition and transfusion history.
    - If **consistent** with the patient's history or condition, consider continuation of transfusion at a slower rate, and appropriate symptomatic treatment.
    - If signs and symptoms are **not consistent** with the patient's condition or transfusion history, discontinue the transfusion and **report urgently to the transfusion lab**. Avoid further transfusion of any blood product until the reaction has been investigated unless absolutely necessary.
- If bacterial contamination is suspected undertake appropriate investigations (E.g. blood cultures).
- Consider the possibility of pulmonary complications such as Transfusion Associated Circulatory Overload (TACO), Transfusion Related Acute Lung Injury (TRALI)
  OR Transfusion Associated Dyspnoea (TAD). See appendix 6 for the characteristics of these pulmonary complications.
- Complete a transfusion adverse events form (see Transfusion Related Adverse Events Report form which is an associated document to this policy on the Trust Intranet).
- Return required samples and the remains of all donor bags to the transfusion lab.
- Complete a DATIX Adverse event form.

Management of a SEVERE or life threatening acute transfusion reaction

If there is evidence of life threatening problems (Airway Breathing or Circulatory problems), and/or wrong blood given and/or evidence of a contaminated unit (see Management of Acute Transfusion Reactions which is an associated document to this policy on the Trust Intranet) the following actions should be taken:-

- Stop the transfusion. Maintain venous access.
- Call for urgent medical help- use 2222 as necessary.
- Initiate resuscitation- ABC.
- Assess the patient, check patient ID and inspect the unit.
- Monitor the patient (TPR, BP, O_2 sats, urine output).
- Fluid resuscitation (normal 0.9% saline) as appropriate guided by BP, pulse, urine output (catheterise if necessary).
- Avoid further transfusion of any blood product until the reaction has been investigated, unless absolutely necessary.
- **Report urgently to the transfusion lab.** Complete a transfusion adverse events form (see Transfusion Related Adverse Events Report form which is an associated document to this policy on the Trust Intranet. Return required samples and remains of all donor bags to the transfusion laboratory.
- If likely anaphylaxis/severe allergy, follow anaphylaxis treatment pathway.

- If bacterial contamination suspected, follow sepsis pathway.
- If haemorrhage likely to be causing hypotension, fluid resuscitate/continue transfusion.
- Consider the possibility of pulmonary complications such as Transfusion Associated Circulatory Overload (TACO) or Transfusion Related Acute Lung Injury (TRALI). See appendix 6 for a flowchart for assessing Respiratory symptoms during transfusion Complete a DATIX Adverse event form.

5.10 Reporting of Adverse Events

This section of the policy outlines the reporting of transfusion related incidents and is in accordance with the Blood Safety and Quality Regulations (2005).
The objectives of adverse event reporting are:

- To ensure that correct action is taken to highlight any adverse event following or concerned with blood transfusion, and report it to the correct body.
- To ensure such events are appropriately investigated or audited.
- To allow implementation of required actions in order to prevent re-occurrence.
- The aim is **not** to apportion blame but rather to learn from experience and improve practice accordingly.

The Trust is committed to reducing errors in the administration of blood and blood components and fully supports the guidelines set out by British Standards in Haematology (BSH) and the recommendations of Serious Hazards of Transfusion (SHOT) report.

In the event of a serious adverse transfusion incident, an open and honest culture must be maintained between the Trust and the patient/relatives. Furthermore, in addition to investigating the root cause, the Trust also has a duty to offer support for the employee(s) involved.

Any serious adverse reactions observed during or after transfusion which may be attributable to the quality or safety of blood or blood components issued for transfusion must be reported to the Blood Transfusion Laboratory who will report the incident to the Medicines & Healthcare products Regulatory Agency (MHRA), as is required by law.

Responsibilities for reporting adverse events

All staff have a duty to report any transfusion incidents/near misses regardless of the impact of the incident on the person directly involved.

Transfusion incidents/near misses must be reported to the laboratory, as soon as possible after the incident is identified, and a trust adverse event form must be submitted via DATIX.
All DATIX logged adverse events will be reviewed by the Transfusion Operational Management Team. Any suggested corrective and preventative actions must be implemented in order to reduce the possibility of a similar occurrence.
Where appropriate, the near-miss, adverse reaction or adverse event will be reported by the TOMT to the relevant external bodies e.g. SHOT/SABRE.

National reporting of adverse effects of transfusion

SHOT – Serious Hazards of Transfusion.
This is a confidential reporting system for serious adverse events during or following transfusion, and also 'near misses'. This data is collated, and an annual report is published. To view reports and further information, please visit the SHOT website www.shotuk.org

SABRE - Serious Adverse Blood Reactions and Events
This is a mandatory reporting agency, to which all serious adverse reactions and events must be reported to comply with the trust legal responsibilities under the Blood Safety & Quality Regulations 2005.

Reporting to both of these agencies is made via the Transfusion Operational Management Team (TOMT) and so it is ESSENTIAL that the Blood Transfusion laboratory is informed **immediately** of any actual/suspected Blood Transfusion adverse event and a DATIX is completed.

Adverse events associated with the administration of licensed fractionated plasma derivatives e.g. albumin, immunoglobulin and coagulation factor concentrates, should be reported to the MHRA using the 'Yellow Card' system.

SHOT Reportable Near-miss Incident (SHOT NM)
Near-miss incidents are reportable by the transfusion laboratory to the Serious Hazards of Transfusion Scheme. These include, but are not restricted to:

- Any error which, if undetected, could result in the determination of a wrong blood group.
- The issue of the incorrect component (e.g.: non irradiated red cells to a patient who requires these).
- The collection of an incorrect, inappropriate or unsuitable component, but which was recognised before transfusion took place.

Serious Adverse Reactions (SAR)
This constitutes 'an unintended response 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' (MHRA 2005)
This can include:

- Immunological haemolysis due to ABO incompatibility.
- Immunological haemolysis due to other allo-antibody.
- Non – immunological haemolysis.
- Transfusion transmitted bacterial infection.
- Anaphylaxis/hypersensitivity.
- Respiratory symptoms such as TACO or TRALI.
- Transfusion transmitted viral infection, prion infection or parasitic infection (i.e. Malaria).
- Post transfusion purpura (PTP).
- Graft versus host disease (GVHD).
- Other serious reaction(s) (i.e. transfusion related circulatory overload).

Any of the above would require submission via SABRE (Serious adverse blood reactions and events) to the MHRA (Medicines and Healthcare products Regulatory Agency).

Serious Adverse Events (SAE)
This constitutes '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.' (MHRA 2005)

These include (but are not restricted to):

- Incorrect group given (e.g. RhD positive to RhD Negative patient).
- Incompatible ABO group given, but no adverse reaction.
- CMV or Irradiated Blood requested but not given.
- Expired unit transfused.
- Cold chain failure- blood out of temperature control.
- Unit mislabelled.
- Fate of unit not recorded, or transfusion tag not returned.

5.11 Additional advice for paediatric transfusions

Children on regular transfusion programmes

There are only small numbers of local children on regular transfusion programmes. They should all be under a shared care arrangement with a tertiary paediatric haematology centre-most often Addenbrookes Hospital. The most likely diagnoses are thalassaemia major and bone marrow failure syndromes e.g. Diamond Blackfan syndrome.

Pre transfusion blood tests

Children on regular transfusion programmes require a FBC and crossmatch. The timing of their crossmatch will depend on their previous transfusion history. National guidelines state that to ensure that the specimen used for compatibility testing is representative of a patient's current immune status; serological studies should be performed using a blood sample collected no more than 3 days in advance of the actual transfusion when the patient has been transfused or pregnant within the preceding 3 months.

Patients on iron chelation will need additional tests every three months for:

- Ferritin.
- LFT's.
- Urea and Electrolytes.
- Creatinine.
- Random glucose.
- Annual thyroid function and calcium level.

Check if the patient is up to date with these tests and if not they can be done at the same time as blood is taken for FBC and cross match.

Prescription of red cells

Children with thalassaemia major require their Hb to be maintained above 95 to 100g/L to optimize normal growth and development and inhibit bone marrow expansion. Transfusion frequency is usually every 3-4 weeks.

Children with other diagnoses may have different target Hb depending on their diagnosis. Check for any guidance from their notes or ask their local Consultant if unsure. If their local consultant is not available or if uncertainty exists, contact their tertiary centre haematology team for advice.

Transfusion should be prescribed carefully in mls, not units, using the formula below to determine the volume to be transfused

Weight (kg) x Hb rise required (g/L) x 0.4 = Volume of red cells to be transfused (mls)

For example: 20kg child with current Hb of 70g/L and target Hb of 110g/L

20 x (110-70) x 0.4 = 320 mls red cells to be transfused

The transfusion is given at a rate of 5ml/kg/hour (up to a maximum of 150mls/hour). According to hospital policy, transfusion should be avoided at night, unless there is an acute clinical need and sufficient staffing.

Red cell Transfusion must be completed within 4 hours of the time the blood was removed from the blood fridge.

Other expected standards

As these children will have long term attendance at hospital for transfusions, every attempt must be made to have them seen and cannulated promptly by an experienced doctor or nurse.

Good transfusion practice should be followed as per hospital transfusion policy. They should have pre transfusion observations recorded- minimum of pulse, temperature, blood pressure and respiratory rate. These should be repeated 15 minutes after the transfusion is commenced and at the end of each unit. The patient must be observed throughout the transfusion for signs of reaction. If any signs occur, the blood must be stopped immediately and medical advice sought.

Each attendance for transfusion should be documented in the notes, and a discharge letter given. Advice must be given regarding how to contact the hospital if there are any signs of reaction when discharged from hospital.

A note of the benefit or lack of benefit of the transfusion should be made.

Post transfusion Hb check. This is not routinely required after each transfusion, but should be done if the patient's consultant or haematologist requests. Check notes for individual plans.

Paediatric Red Cell Transfusions in Homozygous Sickle Cell Anaemia

Most children with homozygous sickle cell disease are not receiving regular transfusions. From the age of 2 years onwards patients with homozygous sickle cell disease should be referred for transcranial Doppler studies. Some children with raised cerebral blood flow velocities are considered for a regular transfusion programme.

Since 2006 there has been a national neonatal screening programme for sickle cell anaemia, so babies born in the UK after then should have been identified in the neonatal period.

The parents should have received advice on general measures to reduce the frequency and severity of sickling, which is avoidance of cold, dehydration, hypoxia and aggressive treatment of intercurrent infections. They should all have received pneumococcal vaccination (prevenar at 2, 4 and 13 months then pneumovax at 2,7,12 and 17 years). They should have an annual flu vaccination from 6 months of age, and be offered a course of Hep B immunization if not immune. By age 3 months they should be receiving regular prophylactic penicillin.

The most common reason for hospital admission in sickle cell anaemia is due to a painful crisis. The management is analgesia, hydration and treating any precipitating infection. Such children should have open access to their local paediatric ward.

Complications requiring top up or exchange transfusion

Transfusions should not be undertaken without careful consideration of the benefits and risks. There is an incidence of about 18% of alloimmunisation following blood transfusion in the sickle population-two thirds of the antibodies described are in the Rh or Kell systems. There is an incidence of delayed haemolytic transfusion reactions in sickle cell disease of between 4 and 22%-significantly higher than in other patients. Informed consent from the parents, or child where appropriate, should always be obtained prior to transfusion.

There are certain situations where an acute blood transfusion will be necessary:

- **Acute splenic sequestration**- i.e. acute fall of haemoglobin of more than 20g/L below steady state, markedly elevated retic count together with an acute increase in spleen size. This is a serious complication of sickle cell disease, and if unrecognized causes significant mortality. Mortality rates can be reduced substantially by parental education, regular palpation of the abdomen at home to detect early signs of splenic enlargement and prompt intervention with transfusion. **Target Hb is to the steady state Hb level.**

- **Temporary red cell aplasia** (usually due to parvovirus B19 infection).
  This is characterized by a drop in haemoglobin over about 1 week, often to levels as low as 30g/L It may be associated with fever, headache and abdominal pain. In contrast to acute splenic sequestration the retic count will be very low, and IgM for parvovirus B19 will be present. Recovery may be spontaneous, but a top up transfusion is usually indicated. **Target Hb is to steady state Hb level.**

- **Acute sickle chest syndrome.** This is characterized by pleuritic chest pain, fever, abnormal chest examination and new pulmonary infiltrates on X-ray. Early intervention with analgesia, oxygen, physiotherapy, antibiotics and blood transfusion can significantly reduce morbidity and mortality. **Aim to achieve HbS level below 30% and Hb 100-110g/L** Consideration should be given to exchange transfusion.

- **Acute neurological complications**. Cerebrovascular disease, particularly proximal vessel stenosis predisposes children to acute cerebral infarction. Occasionally older children present with subarachnoid or intracerebral bleeds related to cerebral artery aneurysms. Acute ischaemic events require urgent investigation with CT and/or MRI scan to define the extent and exclude a haemorrhagic component. This should be followed by **exchange transfusion as soon as possible** to reduce the risk of progression of the lesion. Aim to achieve HbS level below 30% and Hb 100- 110g/L. Royal College Guidelines on the management of acute stroke in childhood should be followed.

- **Prior to a surgical procedure.** A minor procedure such as circumcision or tooth extraction can usually be done safely without a transfusion. (Extra oxygen may be required). With other elective procedures a blood transfusion may be necessary as a day case a few days prior to the surgery, particularly if the child is prone to complications. If an emergency surgical procedure is required a pre-op transfusion is likely to be required.

Indications for regular long term transfusion in sickle cell disease

Decisions about regular long term transfusions should be made in consultation with the patient/carers and Paediatric Haematologist:

- Primary and secondary stroke prevention.
- Recurrent acute chest syndrome not prevented by hydroxyurea.
- Progressive organ failure.

Please discuss with seniors and have a low threshold for discussion with tertiary team. Our patients will usually be having shared care with Addenbrookes Consultant Paediatric Haematologists- contact via Addenbrookes switchboard.

Guidelines for Preterm Neonates

This summary guidance should be used in conjunction with the 2016 BSH Guidelines transfusion for foetuses neonate and older children.
Studies support restrictive transfusion thresholds.

Red cells for top up transfusions

The table below applies to very preterm babies (<32 weeks); for later preterm/term babies the values for babies off oxygen may be used.

- Generally transfuse 15 mL/kg for non-bleeding neonates.
- Where the term or preterm neonate does not require resuscitation, undertake delayed cord clamping.
- Minimise phlebotomy where possible, using small volume samples.

- Transfusion rate: 5mL/kg/hr.

Postnatal age	Suggested transfusion threshold Hb (g/L)		
	Ventilated	**On oxygen/ NIPPV (non-invasive positive pressure ventilation)**	**Off oxygen**
1st 24 hours	<120	<120	<100
≤ week 1 (day1-7)	<120	<100	<100
week 2 (day 8-14) ≥week 3 (day 15 onwards)	<100 <100	<95 <85	<75* <75* *It is accepted that clinicians may use up to 85 g/L depending on the clinical situation.

Platelets

For preterm neonates with platelets <25 x10^9/L, transfuse platelets and treat the underlying cause of thrombocytopenia.
Suggested transfusion thresholds for preterm neonates:

Platelet count (x10^9/L)	**Indication for platelet transfusion**
<25	Neonates with no bleeding (including neonates with neonatal alloimmune thrombocytopenia (NAIT) if no bleeding and no family history of intracranial haemorrhage (ICH)
<50	Neonates with bleeding, current coagulopathy, before surgery, or infants with neonatal alloimmune thrombocytopenia (NAIT) if previously affected sibling with intracranial haemorrhage (ICH).
<100	Neonates with major bleeding or requiring major surgery (e.g. neurosurgery).

Table applies to preterm babies; clinicians may also choose to use for term babies.
Typical transfusion volume: 10-20 mL/kg; rate 10-20 mL/kg/hr.

Fresh Frozen Plasma and Cryoprecipitate

Routine coagulation screening is inappropriate: results are difficult to interpret in neonates and routine testing may lead to increased FFP transfusion without benefit.

- FFP should not be used routinely to try to correct abnormalities of the coagulation screen alone in non-bleeding neonates.
- FFP may be of benefit in neonates with clinically significant bleeding or prior to invasive procedures with risk of significant bleeding, and who have abnormal coagulation (PT/APTT significantly above the gestational and postnatal age-related range).
- FFP should not be used for simple volume replacement or routinely for prevention of IVH.
- Cryoprecipitate should not be used routinely for nonbleeding neonates with decreased fibrinogen. It may be considered for fibrinogen <1g/L for surgery at risk of significant bleeding or to critical sites.

Typical transfusion volumes: FFP 15-20 mL/kg, cryo 5-10 mL/kg;
Rate 10-20 mL/kg/hr.

5.12 References

British Society for Haematology (BSH) (2016) Guidelines on transfusion for fetuses, neonates and older children.
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Available at http://www.transfusionguidelines.org.uk/transfusion-handbook [Accessed 05/03/2020].

National Institute for Health and Care Excellence (NICE) (2015) Guideline NG24 Blood Transfusion Available https://www.nice.org.uk/guidance/ng24
[Accessed 05/03/2020].

SaBTO (Advisory committee on the Safety of Blood Tissues & Organs (2012) Position statement:- Cytomegalovirus tested blood components Available at http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_133086.pdf [Accessed 05/03/2020].

Serious Hazards of Transfusion *Annual Report*

Available at http://www.shotuk.org [Accessed 05/03/2020].

6. ASSOCIATED DOCUMENTS

6.1

- Clinical Guidelines for Red Cell Transfusion in adults (C0162)
- Platelet transfusion- Guideline for practice (C0331)
- FFP transfusion- Guideline for practice (C0329)
- Cryoprecipitate transfusion- Guideline for practice (C0330)
- Guidelines on the use of OCTAPLEX® (Prothrombin complex concentrate/PCC) for rapid reversal of warfarin in association with life threatening bleeding (C0254)
- Policy for the use of recombinant factor VIIa (rVIIa) in the treatment of uncontrolled haemorrhage (C0255)
- Policy for the use of Cytomegalovirus (CMV) negative blood products (C0661)
- Policy on consent to treatment (C0412)
- Policy for treatment of Jehovah's Witnesses (C0413)
- Policy on advance decisions (C0370)
- Maternity Guidelines- Section 3.09 Blood Transfusion (0487)
- Policy for the use of Irradiated blood products (C662)
- Policy for Assessment of Staff Collecting Blood components for transfusion and caring for a patient having a transfusion (C0175)
- Management of major haemorrhage (C0185)
- Policy and assessment for clinicians in the administering of intravenous (IV) drugs (C0019)
- Guideline for Assessment of Clinicians Performing Venepuncture (C0022)

7. MONITORING COMPLIANCE

Document Section		Control	Checks to be carried out to confirm compliance with the policy	How often the check will be carried out	Responsible for carrying out the check	Results of check reported to: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)*	Frequency of reporting
Page	**Section**	**WHAT?**	**HOW?**	**WHEN?**	**WHO?**	**WHERE?**	**WHEN?**
	5.6	Process for requesting and testing samples for pre transfusion compatibility testing	Review of transfusion adverse events / laboratory error log including labelling and requesting errors	As a standing agenda item at Transfusion Operational Management Team (TOMT) meetings (at least 1 per month)	Transfusion Operational Management Team	Hospital Transfusion Committee	3 times per year
	5.9 5.10	Management and reporting of transfusion adverse events/ reactions	Review of adverse events reported via DATIX	As a standing agenda item at Transfusion Operational Management Team (TOMT) meetings (at least 1 per month)	Transfusion Operational Management Team	Hospital Transfusion Committee	3 times per year

	5.8	Maintaining traceability records for units, as required by Blood Safety & Quality Regs (2005)	Review of traceability tag return and completion of tracking logs	12 times a year (monthly)	Transfusion Practitioners	Hospital Transfusion Committee	3 times per year
	5.8	Care given to patients having a transfusion	Check of bedside care to include completion of special requirements box, patient identification, recording of observations and staff training records for collecting/ administering blood	Random spot check at least 5 per month	Transfusion Practitioners	Hospital Transfusion Committee	Annually

APPENDIX A: DEFINITIONS OF TERMS

Blood product - Any therapeutic substance prepared from human blood.

Blood component - Red cells, Platelets, Fresh frozen plasma, Cryoprecipitate

Plasma derivative - proteins prepared from large pools of human plasma under pharmaceutical manufacturing conditions, e.g. coagulation factors, immunoglobulin, human albumin solution.

SHOT - Serious Hazards of Transfusion reporting system.

MHRA - Medicines and Healthcare products Regulatory Authority –agency with responsibility for standards of safety, quality and performance

SABRE - Serious Adverse Blood Reactions & Events, a MHRA reporting scheme.

TOMT - Transfusion Operational Management Team comprising of the Transfusion Laboratory Manager, Transfusion Practitioner and Laboratory Senior Biomedical Scientist and Lead Consultant for Transfusion.

MGC Pathology - Management and Governance Committee, the Committee exists to provide leadership on Pathology and Pathology related issues by providing multi-disciplinary input into the operational management of Pathology driven services and to ensure appropriate standards of care delivered are assured through Clinical Governance, finance and performance mechanisms.

APPENDIX B: APPENDICES 1-7

Appendix 1

Blood Transfusion – Non participation notice

The trust requires that all staff participating in blood transfusion must attend regular transfusion education and updates.
A register of all staff that have completed a transfusion education session is documented and maintained on the Electronic Staff record (ESR)
If you cannot demonstrate documented transfusion education, you must not participate in any part of transfusion, including prescribing, instructing others to prescribe, taking blood samples for transfusion testing or administering any blood or blood component.
You are asked to sign a copy of this notice, to confirm that you have read and understood the importance of this.

I confirm that I have read and understand the contents of this notice, and that I do not intend to participate in the provision of blood transfusion.

I understand that if circumstances change, and I become involved in the care of patients receiving a blood transfusion, I am responsible for arranging to receive the appropriate education and updates

Print name …… Signature……

Job Title ……..

Ward/Department…….. Date……

Appendix 2

East of England Regional Transfusion Committee Shared Care Form:
Irradiated/ Specialist Blood Components & Specialist Treatment Communications Document

Section A: To be completed by a member of the Clinical Team and then sent to the Transfusion Laboratory for completion of the form.			
Affix Addressograph here or complete the following details:	Referring hospital:	**ABO and RhD Group Details (Transplant Centres only):**	**Specialist Requirements**
Patient First and Family Name:	Specialist Treatment Hospital:	Donor Group:	Irradiated: Yes / No CMV Neg: Yes / No
Date of Birth:	Diagnosis:	Patient Group:	Alert added to HCR? Yes / No
NHS / Hospital Number:	Specialist Treatment required or received **(see o'leaf*):**	Phenotype determined prior to treatment?* Yes/No	Patient Informed of Specialist Requirements? Yes / No
Address	Signed:..... Print Name..... Date / /	Contact number / Bleep.....	

Sections B & C are ONLY to be completed by the Transfusion Laboratories

Section B: Please document below the ABO and D (where applicable) group of the blood components that the patient currently requires		
Red cells:	Platelets:	FFP:

RBC Antibodies	**Specialist Requirements**	**Additional Requirements**
Historical Antibodies:	HLA / HPA abs: Yes / No	RBC Phenotype:
Current Antibodies:	Specificity:	Washed RBCs: Yes / No
D.A.T		Washed Platelets: Yes / No
Signed:..... Print Name:.....		Date:.....

Section C: Please document below the audit trail for receipt & transfer of data		
I confirm all special requirements requested in section A have been input to the LIMS as requested	**Copy of completed form to be sent by Secure Fax or scanned copy emailed by Laboratory of identifying hospital to Shared Care Hospital Laboratory**	**Confirmation of receipt by Shared Care Hospital Laboratory.** To confirm receipt & action of this form please sign, print name, and date below and fax back after entering information into shared Care Hospital LIMS computer
Date entered to LIMS / / Signed:..... Print Name.....	Date Fax /email sent: / / Signed:..... Print Name.....	Date specialist requirements input into Shared Care Hospital LIMS: / / Signed:..... Print Name.....

Ratified by the East of England RTC 18/10/12 **V5 12/07/18**

NHS
East of England Regional Transfusion Committee

Irradiated blood components	
Indication	**Duration of requirement**
Patients receiving transfusions from a first or second degree relative	At each transfusion episode
All intrauterine transfusions (IUT). Other neonates / infants receiving RBC or platelet transfusions – where there has been a previous IUT	6 months post expected delivery date
Neonatal exchange transfusions (ET) if there has been a previous IUT For other neonatal ET, irradiation is recommended unless it causes a clinically significant delay in transfusion	6 months post expected delivery date
Patients receiving purine analogues (e.g. fludarabine, cladrabine, deoxycoformicin) For newer purine analogues and related drugs, such as bendamustine	Indefinitely Until further data becomes available
Patients receiving allogeneic haemopoietic stem cell (HSC) grafts. If chronic GvHD is present or the patient is taking immunosuppressants,	From the start of conditioning therapy & while on Graft-versus-Host Disease (GvHD) prophylaxis (usually 6 months post transplant) Indefinitely
Allogeneic HSC donors	Transfusions 7 days prior to or during the harvest of their HSC
Patients who will have autologous HSC graft:	Any transfusion 7 days prior to and during the bone marrow/stem cell harvest. Any transfusion from the start of conditioning chemo-radiotherapy until 3 months post-transplant (6 months if total body irradiation was used)
Patients with aplastic anaemia receiving immuno suppressive therapy with anti-thymocyte globulin (ATG) and/or alemtuzumab (anti-CD52)	Indefinitely

Irradiated blood components (cont'd)	
Indication	**Duration of requirement**
Patients with known or suspected T-cell immunodeficiency, such as DiGeorge syndrome, the blood should be transfused within 24 hours of irradiation	Indefinitely. Once a diagnosis of immunodeficiency has been suspected, irradiated components should be given while further diagnostic tests are done
Patients with Hodgkin Lymphoma, at any stage of the disease	For life
Cytomegalovirus (CMV) negative blood components	
Indication	**Duration of requirement**
IUT and neonates	Up to 28 days post expected delivery date
Elective transfusions during pregnancy	Where possible for duration of pregnancy

Notes on completion of form overleaf:

- Under "Specialist treatment required or received" please give details of treatment resulting in need for special requirements
- Under "Specialist requirements" please circle yes or no
- If a patient's requirements change, please fill out another form

Information on irradiated products derived from NHSBT information leaflets.
Information on CMV negative components from SaBTO.

***Monoclonal antibody therapy:**

Patients with relapsed or refractory multiple myeloma (MM), relapsed or refractory acute myloid leukaemia (AML) or myelodysplastic syndrome MDS) may be treated with monoclonal antibody therapies, currently **Daratumumab** (Darzalex), **Isatuximab** and **anti-CD47**. However, these therapies have the potential to interfere with serological investigations and compatability testing in blood banks. Where possible, the patient's phenotype should be tested prior to the commencement of therapy and transfusion laboratories **must** be notified of patients receiving these treatments, including finish dates, as interference can last for up to 6 months after the last infusion.

Appendix 3

Procedure for transport of blood units to the PCH Emergency Department for Urgent / Emergency Transfusion

Patient in PCH ED needs urgent or emergency blood transfusion

- Take a blood sample for cross match & send to Transfusion Laboratory via air tube
- Ring Transfusion on 8451/2 (Bleep 1151 out of hours) to inform them of urgent/emergency cross match
- Ask if a confirmatory blood group sample needed and take/ send as necessary according to protocol.

How urgent is the need for blood?

- **Desperate** -use emergency O RhD Negative blood (available immediately)
- **Very urgent**- use group specific blood (issued within 15 minutes from receipt of sample)
- **Fully cross matched** blood will be available 50 minutes from receipt of sample

In major haemorrhage situations (blood loss >150ml/min) activate massive blood loss protocol –see policy on intranet

- Contact transfusion and ask them to pack the blood units required in a transport box, for transport to ED.
- Give the name of the requesting Dr and the Nurse taking responsibility for the blood to transfusion lab.
- Send a porter to collect the box of blood from transfusion *Please note porters are only permitted to collect blood in a box, not individual units.*

↓

- The transfusion BMS will pack blood units into a transport box and complete the tracking log.
- The pink and the yellow copy of the compatibility forms will be put into the box with the units.
- A laminated sheet with date & time box packed and time by which blood needs to be returned if not used, to be placed in front pocket of box

↓

The transport box is taken to Emergency Department and handed to the named nurse, who now takes responsibility for the blood.
The nurse should note the time the box was packed- **blood must be used/ returned within 90 minutes of this time.**
The units **must remain in the box** and are only to be removed immediately prior to use.
The lid of the box must remain closed, to maintain temperature control.

Blood used	Blood not used (or some units not used)	Patient transferred to another clinical area or hospital
• **Take units from box one at a time** • Sign front of pink and yellow forms next to **each unit used** • Return empty box, pink form and traceability tags to the transfusion lab as soon as possible • Yellow form file with ED record card • BMS will note units used & files pink copy/tags	• Return box, pink form and **unused** units to transfusion lab **within 90 minutes** of the time the box was originally packed. Contact lab to arrange return of box. • Return traceability tags for any **used** units to the transfusion Lab as soon as possible • Yellow copy to ED record card • BMS returns units to stock and completes tracking log	• **Inform transfusion Lab immediately** • **Do not use this box to send blood to another area (including theatre) or out of the hospital without authorisation from the lab.**

If the transfusion lab has not received the box / blood back within 90 minutes of issue, the BMS will ring the Emergency Department Coordinator on Ext 8656 for further information.

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Transfusion Compatibility

When performing the pre transfusion bedside check, it is good practice to check that the component issued is compatible with your patient's blood group.

If the laboratory issues a component that is of a different ABO or RhD group to your patient's group, but is compatible for your patient, they will always note this on the paperwork issued with the unit.

The table below will assist you in checking compatibility, but if you have any concerns or questions, please contact the transfusion laboratory for advice.

- PCH Lab Ext 8451 (bleep 1151 out of hours)
- Hinchingbrooke Lab Ext 6157 (bleep 1257 out of hours)

Patient ABO/ RhD Group	Compatible RED CELLS (in order of preference)	Compatible FRESH FROZEN PLASMA/ OCTAPLAS/ CRYOPRECIPITATE (in order of preference)	Compatible PLATELETS (in order of preference)
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
RhD Positive	Positive or Negative	RhD group not applicable to these components	Positive or Negative
Rh D Negative*	Negative*	RhD group not applicable to these components	Negative*

*Please remember that RhD positive red cells and platelets may be issued to RhD negative women over 50 years and males of any age according to availability and urgency of transfusion. Ask transfusion for further advice.

Only patients who are group O may have group O FFP/Octaplas/ Cryoprecipitate

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Giving sets and administration rates

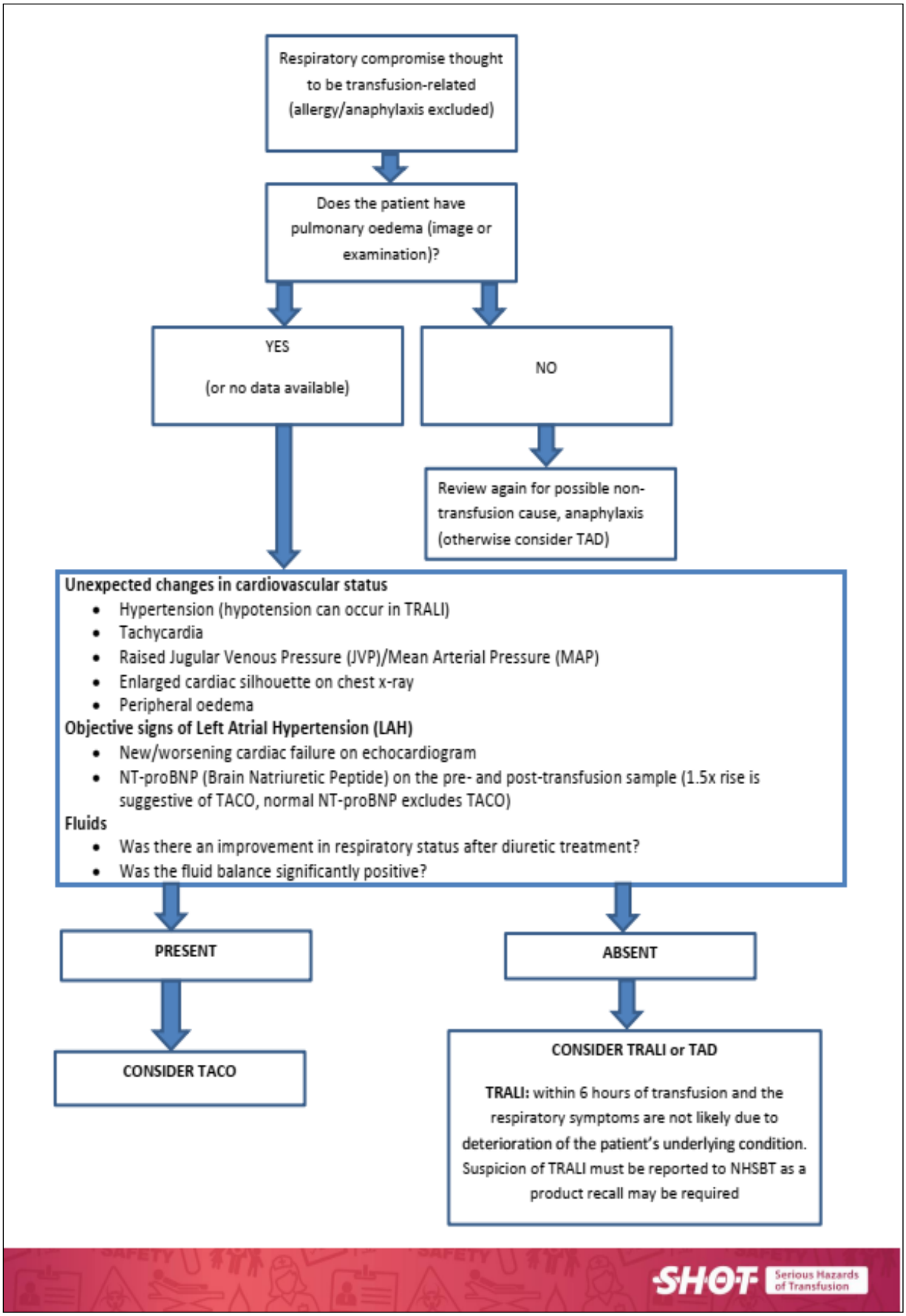
Appendix 5

Component	Giving set to be used	Suggested Infusion Rate *(depending on the volume to be given and the clinical status of the patient)*	Comment
Red Cells	Blood giving set (170–200 micron filter)	**Adults** 2-3 hours per unit (more rapidly in severe haemorrhage) **Paediatrics** 5ml/kg/hr (usual max rate 150ml/hr)	• Either gravity or infusion pumps may be used. • Infusion pumps should only be used if the manufacturer verifies them as safe for that purpose. • The transfusion must be completed **no more than 4 hours** removal from the Blood Bank. • In neonatal transfusion, if a syringe driver is used for administration, an appropriate filter must be incorporated.
Platelets	Blood giving set (170–200 micron filter)	**Adults** 30 minutes per unit **Paediatrics** 10-20ml/kg/hr	• Use a new giving set for each unit of platelets • Use immediately after collection. **Do not refrigerate** • In neonatal transfusion, if a syringe driver is used for administration, an appropriate filter must be incorporated.
FFP (Fresh Frozen Plasma)	Blood giving set (170–200 micron filter)	**Adults** 30 minutes **Paediatrics** 10-20ml/kg/hr	• Once thawed, FFP must not be re-frozen and should be transfused as soon as possible as post-thaw storage will result in a decline in the content of labile coagulation factors. • In neonatal transfusion, if a syringe driver is used for administration, an appropriate filter must be incorporated.

Component	Giving set to be used	Suggested Infusion Rate *(depending on the volume to be given and the clinical status of the patient)*	Comment
Cryoprecipitate	Blood giving set (170–200 micron filter)	**Adults** as prescribed (rapid infusion may increase risk of acute reaction) **Paediatrics** 10-20ml/kg/hr	• Use immediately after collection from blood bank. **Do not refrigerate** • In neonatal transfusion, if a syringe driver is used for administration, an appropriate filter must be incorporated.
Human Albumin Solution (HAS)	Standard IV giving set	As prescribed	Using a vented giving set will allow the fluid to flow out of the glass bottle
Granulocytes	Blood giving set (170–200 micron filter)	As prescribed by Consultant Haematologist	Whole dose should be infused over 1-2 hours
Prothrombin Complex Concentrate (PCC) **e.g. Octaplex**	Please refer to the Guidelines for administration of Octaplex PCC (C0254) on the intranet		
For advice on giving other products (e.g.: Anti D or individual clotting factors) please refer to the relevant policy or product information insert			

Respiratory symptoms during transfusion Appendix 6

(Acknowledgment to Serious Hazards of Transfusion SHOT 2019)



Appendix 7

Concessionary release form for blood components/products required on standby for potential obstetric emergencies.

A formal deviation from the 3 day rule (allowing cross match samples to remain acceptable for up to 7 days) will be considered when blood is required to stand by for potential obstetric emergencies, e.g. placenta praevia.
Fetomaternal haemorrhage constitutes a smaller stimulus than transfusion, because the number of foreign antigens is limited, and in many pregnancies the volume of red cells transferred from foetus to mother is too small to stimulate a primary response.

This form must accompany the transfusion request for blood.

Section A - Patient details and concession information		
First Name	Surname	NHS/DIS Number
Date of Birth	Ward/ Location	Consultant
Brief description of reason for concession including justification:		
Completed by: Name: Signature: Date / time:		

Section B - Blood component or blood product details	
Description of component/product for concessionary issue	Number of units

Section C - Confirmation that the concession is justifiable in the patient's best interests	
Obstetrician authorising the concessionary release of blood components :	
Signature:	Designation:
Date:	Time:

Section D- Confirmation of Concessionary issue	
Issuing BMS Name:	Signature:
Date / time:	

Section E- Review of documentation of the event
Signature and designation of person reviewing this concession (usually TLM or QM)

APPENDIX C: EQUALITY AND FREEDOM TO SPEAK UP IMPACT ASSESSMENT STAGE 1

Follow this link to complete an electronic Equality and Freedom to Speak Up Impact Assessment.

Your answers will be converted into a numerical value and calculated against the above EqFSUIA matrix to provide an inequality score for each protected characteristic.

You will receive an email with the score results of your assessment, which you should place into the table below. The details of your submission will be logged within the EDI and Armed Forces data systems. If your score is below 7, you can enter your results into the below table with no further action required.

If any score exceeds 7 points, you will be contacted automatically to initiate an advanced Equality and Freedom to Speak Up Impact Assessment using co-production processes to mitigate the issue identified.

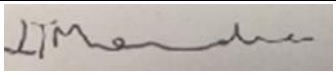
Age	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Armed Forces Community	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Carers	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Disability	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Gender Identity or Reassignment	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Marriage and Civil Partnership	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Pregnancy and Maternity	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Race	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Religion and Belief	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Sex	Equality Impact Score	**0**
	FTSU Impact Score	**0**
Sexual Orientation	Equality Impact Score	**0**
	FTSU Impact Score	**0**

APPENDIX D: QUALITY ASSURANCE CHECKLIST

		Y/N/ n/a	COMMENTS (to author for any amendments)
1	**Title of the document Blood Transfusion Policy(C0160)**		
	Is the title clear and unambiguous	Y	
2	**Type of document (e.g. policy, guidance)**	**Policy**	
	Is it clear whether the document is a policy, guideline, procedure?	Y	
3	**Introduction**		
	Are reasons for the development of the document clearly stated?	Y	
4	**Content**		
	Is the standard model template used?	Y	
	Are all sections of the front cover completed?	Y	
	Is the document in the correct format?	Y	
	• Paragraphs numbered consecutively	Y	
	• Headers: only on front page to contain logo	Y	
	• Footers: on every page except front page	Y	
	Are the Version Control numbers correct in the panel and the footer	Y	
	Is the introduction of the document clear?	Y	
	Are the objectives/aims clearly stated?		
	Are the duties, roles and responsibilities clearly explained? **(policies only)**		
	Are the definitions of terms clearly explained?		
	Have recommendations from Counter Fraud/Internal Audit been included? **(policies only)**		
	Does this document concern the handling, moving or storage of personal identifiable or commercially sensitive information? If yes, has a Summary Privacy Impact Assessment been completed?		
	Does the document meet the criteria for Second Level approval?		
5	**Evidence Base**		
	Is the type of evidence to support the document explicitly identified?	Y	
	Are associated documents referenced?		
6	**Approval Route**		
	Has email approval been received for change of review date only?		
	Does the document identify which committee/group will approve it?		
7	**Review Date**		
	Is the review date identified?		
8	**Equality and Diversity (policies only)**		
	Is a completed Equality Impact Assessment attached?		
9	**Monitoring Compliance and Effectiveness (policies only)**		
	Has section 'Compliance Monitoring' been completed?	Y	

If answers to any of the above questions is 'no', then this document is not ready for approval, it needs further review.

COMPLIANCE TEAM:		
1.	Date Comments returned to author by Compliance Lead	13/7/2022
2.	Date of Compliance Team approval	13/7/2022
3.	Name of Compliance Lead	Stanley Balachander, Policies and Compliance Officer

FIRST-LEVEL APPROVAL: Hospital Transfusion Committee			
If the committee/group is happy to approve this document would the chair please sign below and send the document and the minutes from the approval committee to the author. To aid distribution all documentation should be sent electronically wherever possible.			
Name	**Hospital Transfusion Committee**	**Date**	14/06/2022
Signature			
SECOND-LEVEL APPROVAL COMMITTEE: Quality Governance Operational Committee			
If the committee/group is happy to approve this document would the chair please sign below and send the document and the minutes from the approval committee to the author. To aid distribution all documentation should be sent electronically wherever possible.			
Name	Kanchan Rege	**Date**	14/07/2022
Signature