Clinical Transfusion Policy

Lead Manager:	Lynne Anderson – Chair HTC
Approved by:	Overarching Transfusion Committee
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Amendments

Date	Amendments	Name
07/10/2024	GGH changed opening hours	Tina Watson
07/10/2024	VOL Lab closed details removed from policy / change to number of emergency blood number in fridge	Tina Watson
03/03/2025	Change to section re Undergraduate students, in relation to clinical skills simulation, now desirable.	Tina Watson

This policy has been prepared for the NHS GG&C OTC and represents current standards. It will be reviewed every two years to accommodate future changes in the provision of health care in NHS GG&C and in the provision of blood and blood component.

Contents

1.0 Introduction

This policy is for all staff involved in requesting, authorising, sampling, supplying, transporting and administering blood and blood components (red blood cells, platelets, fresh-frozen plasma, cryoprecipitate and granulocytes). It incorporates national guidelines and directives; the Blood Safety and Quality Regulations 2005 (BSQR)[1], the annual Serious Hazards of Transfusion reports (SHOT)[2] and the British Committee for Standards in Haematology (BCSH) (2016) Transfusion for Foetuses, Neonates and Older Children6.

This policy aims to ensure that the right blood is given to the right patient at the right time, every time.

It provides information for all staff involved in the transfusion process, whether in a hospital or community setting. It is intended to reduce and, ultimately, eliminate the risk of transfusion errors and ensure not only patient safety but the efficient use of blood stocks. Blood is a finite and precious resource; it is incumbent on us to use it appropriately. Where there may be existing differences in practice across NHS Greater Glasgow and Clyde (NHS GGC), this will be highlighted, and information for individual areas will be provided.

Transfusion of blood and blood components is **not risk-free**.

Transfusion errors can occur at any stage in the process, from collection and labelling of the pre-transfusion blood sample, selection and testing of blood components in the laboratory, to the final pre-transfusion checks and administration.

Each year SHOT publishes an annual report. The report consists of an analysis of the previous years' SHOT reportable incidents from across the UK; the report provides key recommendations and learning points for each reportable category. These reports can be viewed via the SHOT website, www.shotuk.org.

The **Blood Safety and Quality Regulations** aim to improve the safety and quality of transfusion by mandating, amongst other requirements:

- Absolute traceability of blood components from donor to recipient
- Standard operating procedures for the storage, distribution and transport of blood and blood components within and out with hospitals
- Training of staff involved in the transfusion process
- Competency assessment of staff involved in the collection of blood components

These are legal requirements. The Medicines and Healthcare products Regulatory Agency (MHRA) oversees compliance with these requirements. They can inspect hospitals and apply sanctions up to and including immediate closure of a hospital Blood Bank if non-compliance is found.

2.0 Governance

Scottish National Blood Transfusion Service (SNBTS) supplies blood components. SNBTS are responsible for recruiting blood donors, collecting and processing whole blood, testing, labelling and distributing blood components to hospital transfusion laboratories.

The **hospital transfusion laboratory (HTL)** is responsible for the storage and inventory management of blood, pre-transfusion testing of patient samples and issue of compatible blood components to named patients.

Pre-transfusion testing, compatibility testing, antenatal and postnatal testing are carried out in the NHS GGC Transfusion Laboratories.

The storage and inventory management of blood and blood components for patients in NHS GGC is the responsibility of the Boards Hospital Transfusion Laboratories; contact numbers can be found in the table on page 5.

GG&C Overarching Transfusion Committee (OTC) has oversight for safe clinical transfusion practice in NHS GGC. The OTC consists of members of each site's Hospital Transfusion Committee (HTC).

3.0 Information and advice about transfusion

The blood transfusion service for NHS GGC is provided by the Hospital Transfusion Laboratories (HTL) located in Queen Elizabeth University Hospital (QEUH), Glasgow Royal Infirmary (GRI), Gartnavel General Hospital (GGH), Royal Alexandra Hospital (RAH) and Inverclyde Royal Hospital (IRH).

Please remember that early and courteous communication with the transfusion laboratory staff will result in prompt and high-quality care for the patient. Biomedical Scientists (BMS) are highly trained and skilled practitioners who have considerable expertise.

Each site's **Hospital Transfusion Committee (HTC)** oversees clinical and laboratory transfusion practice for that site. This is a multi-disciplinary group, with representatives of blood user specialties, whose existence is mandated by the Scottish Executive. It reports to the Chief Executive via the OTC, which is vital in transfusion governance and improving transfusion practice.

Each site also has a **Hospital Transfusion Team (HTT)**, which is comprised of subject matter experts from clinical and laboratory transfusion backgrounds.

3.1 Useful Contact Numbers

Transfusion advice relating to technical matters is available from BMS staff in the hospital transfusion laboratory. Clinical advice can be obtained from a Haematologist (who can be contacted via switchboard) or the Hospital Transfusion Practitioners

Table 1 – Laboratory details and contact numbers

Hospital Site	Contact details for Blood Bank within core working hours	Contact details for Blood Bank out with core working hours
Glasgow Royal Infirmary	Monday - Sunday 24 hrs 0141 242 9603 or 0141 242 9604	Monday - Sunday 24 hrs 0141 242 9603 or 0141 242 9604
Stobhill ACH	No Blood Bank on site – Contact GRI	No Blood Bank on site – Contact GRI
Gartnavel General Hospital	Monday - Friday 8 am – 6 pm 0141 301 7728	Monday – Friday 8 pm – 8 am Friday 5pm - Monday 8am Contact number is GRI 0141 242 9603 0141 242 9604.
Queen Elizabeth University Hospital	Monday - Sunday 24hrs 0141 354 9104 0141 354 9105 (Ext 89104 / 89105)	Monday - Sunday 24hrs 0141 354 9104 0141 354 9105 (Ext 89104 / 89105) Page 17602
Victoria ACH	No Blood Bank on site – Contact QEUH	No Blood Bank on site – Contact QEUH
Royal Alexandra Hospital	Monday – Friday 8.30 am – 5 pm 0141 314 6159 (Ext 06159)	Monday – Friday 5.00 pm - 8 .30 am Friday 5.00 pm – Monday 08 .30 am Page 56359
Inverclyde Royal Hospital	Monday - Friday 8.30 am – 5 pm 01475 504323 (Ext 04323)	Monday - Friday 5 pm - 8.30 am Friday 5 pm - Monday 08.30 am Page 51005

Table 2 Hospital Transfusion Practitioners

Name	Location	Email	Contact number
Tina Watson	GGH, BOC, IRH, RAH, VOL	Tina.watson2@nhs.scot	07970226052
Louisa Wood	QEUH Victoria ACH	Louisa.wood@nhs.scot	07855119136
Lorna Sinclair	QEUH	Lorna.Sinclair5@nhs.scot	07483 121497
Jennet Getty	GRI Stobhill ACH	Jennet.getty@nhs.scot	07966210293

4.0 Blood Transfusion Process

There are three key principles of safe blood administration, and they will be referred to throughout this policy

- Positive patient identification (ID)
- Clear, accurate and timely documentation
- Good communication

The blood transfusion process is complex, with the following ten distinct stages identified.

1. Decision to transfuse and **consent** for transfusion.
2. **Request** of the test or blood component for transfusion, noting any specific requirements.
3. Collecting of the **blood sample** for pre-transfusion testing, including positive patient ID and correct sample labelling beside the patient
4. **Sample receipt** by the testing laboratory, including checking the suitability of the sample for testing and booking into the laboratory information management system.
5. **Testing** the sample in the laboratory and issuing a result for the patient's clinical record via portal.
6. **Component selection** based on clinical request and results of testing.
7. **Labelling** of the component as compatible with/suitable for transfusion to a named patient.
8. **Collection** of the blood component for a named patient using documentation with full patient ID.
9. **Authorisation** of the blood component by a doctor or trained and competent non-medical authoriser of blood components to include any specific requirements.
10. **Administration** of the blood component after rigorous bedside checks plus monitoring of the patient before, during and after the transfusion

4.1 Roles and responsibilities

It is the responsibility of the registered practitioner, in line with their professional body, to ensure that they are trained and competent to participate in any part of the transfusion process relevant to their role.

Before taking on any transfusion task, clinical staff **MUST** complete mandatory Learn Blood Transfusion: Safe Transfusion Practice accessible via LearnPro and/or TURAS Learn. There is additional role-based training, which can be found in Appendix 1, training matrix for additional mandatory / suggested appropriate to their role.

4.2 Positive Patient Identification

Staff involved in transfusion need to be vigilant at each step in the transfusion process, particularly where patient identification is involved. Correct patient identification is fundamental for patient safety whether related to blood sampling or the final bedside check.

All patients must wear an identification (ID) band in line with the NHS GGC Identification Policy.

Blood samples **MUST** be labelled beside the patient in one continuous, uninterrupted process.

All Hospitals within GGC use the Community Health Index (CHI) number as the primary identifier; if CHI is not available, a TrakCare TJ number must be generated to use as the Unique Identifier.

The five core patient identifiers that must be included on their ID band are:

- First name
- Last name
- Date of birth
- Community Health Index (CHI) number / TJ Number
- Gender

The patient's ID band must match the information on all transfusion documentation exactly.

Patients who are alert and orientated

Ask the patient to tell you and spell if necessary:

- First name
- Surname or family name
- Date of birth

Check the patient's unique identification number, e.g. CHI number/ TJ number are the same on the patient's ID band and case records.

Paediatric patients

Identify the patient from their ID band; where possible, this information should be confirmed verbally with the patient / carer.

Patients who are confused

Confused patients may be identified patients or unidentified patients, depending on circumstances.
For patients who are confused but whose details have been confirmed, e.g. from relatives or carers, follow details as per patients who are "unconscious and identified."
For patients who are confused and whose details have not been confirmed, follow details as per patients who are "unconscious and unidentified."

Patients who are unconscious and identified

Check with patient's ID band:

- First name
- Surname or family name
- Date of birth
- Patient identification number, e.g. CHI number /TJ number

Patients who are unconscious and <u>un</u>identified

No details available for patient

- TJ number
- Gender: unknown male/ unknown female

If a patient is admitted unconscious and their identity is unknown, the following procedure must be followed if blood transfusion is necessary:

- The patient must be allocated a unique identification number (TJ numbering system).
- The minimum identifying dataset must include this number plus Unknown Male/ Female (e.g. “Unknown Male A123456”).
- A patient identification band including this minimum data must be attached to the patient.
- This dataset must be used on sample tubes and request forms for transfusion until additional identification details become available.
- Gender must also be included in all documentation.
- When additional identification details become available, the hospital transfusion laboratory must be informed.

The Unidentified Patient is a patient who cannot verify their name and date of birth.

In the absence of a CHI number, the TJ number will be used, both on the blood component compatibility label and on the compatibility form (if issued). This will continue to be used until the patient’s ID can be verified and until laboratory records can be linked. If / when the patient is subsequently identified, Blood Bank must be informed of a change in the patient's details. A subsequent sample and request form must be sent.

Blood and components issued with the TJ number cannot be transfused unless a name band with the TJ number is present.

In the event of a mass casualty incident, please see Major Incident Policies

4.3 Documentation

All transfusions **MUST** be authorised in the National Transfusion Record (NTR), which must be completed in full, and kept at the bedside during the transfusion then filed in the nursing notes section of the health records after transfusion is completed. NTR Information is available here.

The **outcome of the transfusion** including any adverse events/reactions must be recorded in the patient's health records.

4.4 Training and Competencies

Any member of staff that takes part in any aspect of transfusion **MUST** have valid transfusion training. Transfusion training incorporates the following:

- Haemovigilance
- Authorising blood components
- ABO serology
- Blood sampling
- Blood component collection
- Blood component administration
- Caring for the patient receiving a transfusion

ALL staff involved in the transfusion process must complete, as a minimum, the Learnbloodtransfusion (LBT) Safe Transfusion Practice module or the equivalent module appropriate to their role (see appendix 1 – training matrix). The training must be VALID and must be revalidated every two years, or earlier if the staff member is involved in a transfusion incident or has an extended period of absence.

Staff who collect blood must have valid training plus a valid formal competency assessment.

4.5 Transfusion Education

Only staff who have completed the relevant LBT theory modules can participate in the stage/s of the transfusion process appropriate to their roles. Modules are available via NHS LearnPro at https://nhs.learnprouk.com or Turas Learn, available at https://learn.nes.nhs.scot/ See appendix 1 for further information.

There are specific LBT modules, LBT: phlebotomy and LBT: blood collection pathways available for staff only involved in the sampling and blood collection procedures, respectively. Additionally, the SNBTS Transfusion Team training matrix (Appendix 1) aligned to roles provides further guidance on appropriate theory-based modules for staff to enhance their knowledge and understanding of transfusion practice as appropriate to the role. All modules can be accessed via NHS LearnPro, available at https://nhs.learnprouk.com or TURAS Learn, available at https://learn.nes.nhs.scot/.

If you do not have valid transfusion education for your job role, then you must not participate in transfusion practice.

There is an additional legal requirement under the Blood Safety Quality Regulations (2005) for all staff involved in the **blood collection procedure** to undertake a formal practical competency assessment by a trained assessor who has been trained in the Trainers & Assessor Accreditation Programme (TAAP) or Blood Component Collection Assessors Programme (BCCAP). If a **BCCAP assessor** has not undertaken any assessments in a period of one year; or is involved in a near miss or adverse event BCCAP training will require to be repeated. Contact your local Transfusion Practitioner for further advice if appropriate and relevant to role.

Students

Undergraduate students (nursing, midwifery, medical, operating department practitioners and physician associates) can participate, if appropriate, in procedures aligned to their roles, which will provide a learning opportunity to develop the knowledge and skills required upon graduation and preparation for practice as a newly qualified practitioner. Role-specific involvement is detailed in Appendices 1 and 2.

Undergraduate students/ operating department practitioners must provide evidence of theoretical learning using the online training available on Turas; in addition, attendance at the clinical skills simulation is desirable for roles aligned to the transfusion process.' and be supervised as per local, regional agreements with Higher Education Institutes and NHSS Boards. For local information, access the practice supervisors and practice assessor's page of the relevant Higher Education Institute, which will detail the clinical skills guidelines, or contact the local Practice Education Facilitator.

must provide evidence of theoretical learning using the online training available on Turas; in addition, attendance at the clinical skills simulation is desirable for roles aligned to the transfusion process.'

Overall accountability and responsibility for undergraduate involvement in the transfusion process on practice placements is **the responsibility of the registered member of staff for the board** involved in practice supervision and assessment.

All students must provide evidence of safely demonstrating proficiency at the point of registration for the delivery of person-centred, safe and effective care.

If you do not have transfusion competency, then you must not practice transfusion.

4.6 Blood Collection Competency

Face-to-face practical competency assessment is required for all those who are going to be involved in collecting blood components; theoretical assessment satisfies the requirement for ongoing competency demonstration thereafter.
Therefore, **practical assessment** should only be undertaken once for staff and repeated only when a staff member has not collected blood for a period of a year or more or if the individual has been involved in a near miss or adverse event. This is in line with the BSQR 2005 regulations and follows the MHRA Blood Consultative Committee guidance 2008, which states that practice must be "commensurate with the level of risk associated with it".
Theoretical education (LBT: Safe Transfusion Practice) is completed every two years.

It is the responsibility of line management to ensure compliance.

If you have lost your barcode, forgotten your username or password or are having difficulty accessing LearnPro, please get in touch with your local laboratory, Transfusion Practitioner or Learning and Development on Tel: 0141 278 2700 – option 3 respectively.

Your barcode is your individual legal identifier and must not be shared.

Transfusion Disclaimer

If you have no role in transfusion in your place of work, you may sign a disclaimer form. This form is available from the transfusion practitioners.

4.7 Decision to transfuse

The decision to transfuse must be made by assessing all the risks and benefits of transfusion.

Clinicians should base their decision on the patient's complete clinical picture. This includes an appropriate trigger for transfusion combined with an assessment of the severity of symptoms related to the anaemia, thrombocytopenia, coagulation defect or expected adverse outcome if the blood component is not given.

Consideration should also be given to the possibility and likelihood of Transfusion Associated Circulatory Overload (TACO).

It is essential to maintain patient safety, to only transfuse patients when medically necessary, and not to delay transfusing when it is clinically indicated.

Patients have a right to refuse transfusion. However, they must be given a complete clinical picture to enable them to make an informed decision. This may involve the need for translators if the patient is a non-native English speaker and cannot understand the explanations give in English.

Other treatment options should be considered. Alternatives to Blood Transfusion should be implemented on an individual-patient basis. (NICE Guidelines for Transfusion 2015).

4.8 Patient Information and shared decision-making

Every patient has a right to be treated with respect and have their concerns addressed. Patients should be encouraged to ask questions.

Standardised information on the risks and benefits of transfusion should be available to any patient likely to be transfused and also retrospectively to patients who may have been temporarily

incapacitated at the time of the transfusion episode(s), e.g., emergency situations or during surgical procedures.

The information should be accessible and where necessary translated. ("Receiving a Blood Transfusion" patient information leaflet - translations (transfusionguidelines.org)

The information and discussion should be used to inform the patient about the following issues and hence guide shared decision-making.

- The reason transfusion of blood components is required.
- The risks and benefits of transfusion
- The transfusion process
- Any transfusion needs specific to the patient.
- Any alternatives that are available
- That the patient has the option to refuse
- That the patient will no longer be eligible to donate blood after being transfused

To document understanding, it is good practice to get the patient to repeat the information that they have been given in their own words. Use a teach-back approach to ensure that the patient has understood the information provided. The teach-back method allows you to better assess your patients' understanding of their clinical condition and plan of care. It allows you to uncover and clarify any misunderstandings patients may have. It also helps the clinician and patient engage in a more collaborative relationship.

Guidelines from the expert advisory committee on the Safety of Blood, Tissues and Organs (SaBTO) on patient consent for blood transfusion - GOV.UK (www.gov.uk)

Professional accountability

Every practitioner, both as an individual in society and as a professional, is subject to the law. As well as adhering to professional standards drawn up by the Nursing and Midwifery Council and the General Medical Council, nurses, midwives, and doctors are accountable to patients for the provision of safe and appropriate care during the transfusion process. It is the responsibility of the registered practitioner, in line with their professional body, to ensure that they do not participate in any tasks for which they may have not been trained or where they may not be competent. Registered practitioners are accountable for their own actions or omissions. Practitioners are also accountable to their employer for the provision of care appropriate to their level of knowledge and skills.

Timing of transfusions

It is not recommended to carry out elective transfusions overnight or late evening **unless this is clinically indicated**. Staffing levels at night can be lower, creating problems for monitoring and identification checks which may impact on patient safety.
It is not recommended that patients receiving a transfusion should be moved from one clinical area to another until the transfusion is complete unless the patient's clinical condition necessitates this.

Refusal of blood components

Adults

A competent adult is legally and ethically entitled to accept or refuse any specific treatment or procedure even though this decision may endanger his/her life. To administer blood in the face of

refusal by a competent adult patient is unlawful, ethically unacceptable, and may lead to criminal and/or civil proceedings.

Where blood or blood components are refused, every effort must be made to comply with the wishes of the patient, and the use of non-blood alternatives explored fully. The discussion regarding this should be clearly documented in the patient's clinical record.

Children

Children can refuse treatment provided that they are competent to make this decision. This is not determined by their age but by whether they can understand the nature, purpose, and hazards of their treatment and are able to make a value judgement of the risks and benefits.
Where blood or blood components are refused, every effort must be made to comply with the wishes of the patient and parents, and the use of non-blood alternatives must be explored fully. Every effort should be made to include the child and their parents in the decision-making process regarding the need for transfusion and effectively communicate the risks and benefits of transfusion/ no transfusion.

Where the child is not felt to be competent to understand or agree, the advice of the parents/ guardians **i**s accepted. Where the parents/ guardians refuse against medical advice, sensitive discussions should take place to clarify their concerns. Where there remains a refusal against medical advice, the issue should be escalated via medical staff.

Jehovah's Witnesses

It should not be assumed that consent is not available. Individual Jehovah's Witnesses have varying beliefs, and it is important to discuss the issues with each patient and their family. This is especially true where blood products such as albumin or immunoglobulins may be required.

In an emergency, where immediate transfusion is essential to save life or prevent permanent serious harm, and it is not possible to determine if consent would be given or withheld, emergency treatment should be given without delay until such time as the patient is able to confirm whether or not they would accept transfusion.

All discussions around transfusion and refusal of transfusion should be documented in case records. Further guidance is given in the NHS GGC Refusal of Blood Policy and/ or in the case of obstetric patients the Guideline for the Treatment of Obstetric Haemorrhage in Women who refuse Blood Transfusion

4.9 Informed valid consent

This discussion should include information about the risks and benefits of transfusion including Transfusion Associated Circulatory Overload as well as information relating to available alternatives, for example, iron supplementation and must be documented in the case records.

Nursing and medical staff, therefore, have a professional duty to ensure that they have adequate knowledge of transfusion-related issues or that they can access the information and support required by patients undergoing a transfusion.

Blood transfusion information leaflets for patients, relatives, parents and children are available via PECOS and must be used to support the process of informing the patients. These leaflets "Receiving a Transfusion" are also available online and translations are also available online in many languages, "Receiving a Blood Transfusion" patient information leaflet - translations (transfusionguidelines.org).

Information leaflets for health care workers are also available. Patients who have been transfused while unconscious and therefore without prior discussion should be informed about the transfusion as soon as their clinical condition allows. Aside from being good medical practice, this is vital as these patients will no longer be able to donate blood should they wish.

Informed consent for blood transfusion, patient information & shared decision-making

- Informed and valid consent for transfusion is necessary for all patients who will likely, or definitely will, receive a transfusion electively (this applies for whole blood, red blood cells, platelets, fresh-frozen plasma (FFP), cryoprecipitate and granulocytes). The checklist on the front page of the transfusion record should be completed for all elective transfusions by the authoriser. Similarly, the TACO assessment tool should be completed.
- Blood products (such as albumin, anti-D immunoglobulin or intravenous immunoglobulin) are out of scope as these are classified as medicinal products and subject to different regulations, these should be prescribed in a drug Kardex or on Hepma
- Patients on regular transfusion programmes do not require consent to be documented for every transfusion after the initial discussion, but consent should be reviewed periodically. This is clarified in the SaBTO Consent guidance (Dec 2020).
- Where a patient was incapacitated at the time they received a blood transfusion and were not able to give informed valid consent, they should be informed retrospectively of the transfusion prior to discharge and provided with all relevant information.
- A record of all shared decision-making discussions and retrospective transfusion discussions should be documented in the patient's clinical health record.
- To ensure both the patient and their GP are aware that they have received a transfusion, the details of the transfusion should be included in their hospital discharge summary, included in this should be reference to component type and number of units, together with any adverse events associated with the transfusion and any follow-up.

4.10 Written Authorisation

Blood components must be authorised in the NTR by a member of medical staff or designated non-medical authoriser of blood components.
Text must be clearly written and unambiguous.

The authoriser must complete in full the following sections:

- Patient details (surname, forename, date of birth, CHI number and gender)
- Consent
- Risk assessment for transfusion associated circulatory overload (TACO) on front page of NTR
- Which blood components are required and when
- Any specific requirements
- Transfusion of components (rate of transfusion should not exceed 4 hours from removal from controlled storage.)

When authorising red cells (and platelets) authorisers should consider transfusion of a single unit for non-bleeding patients and reassess after each unit.

4.11 Requests for transfusion

All transfusion requests must be appropriate, accurate and specific.

- A request for a group and screen means that pre-transfusion testing will be performed, but

no blood will be issued.

- A request for blood or blood components means that the sample will be tested, and blood issued for the patient based on the urgency denoted on the request form.
- To convert a Group and Screen to a request for blood or blood components, contact the transfusion laboratory to see if they have a valid sample or whether further sampling is required.

4.12 Requesting procedure

Blood Component Request Form

Only staff who have adequate knowledge, skills, understanding and education in transfusion can request blood components for transfusion. See Appendix 2

The blood component request form may be printed from TrakCare by medical staff, registered nurses/midwives who have undertaken specific training or when following an agreed protocol (such as Maximum Surgical Blood Ordering Schedule). It must then be signed by appropriately trained staff (or by nursing/midwifery staff who have undertaken the nurse authorisation of blood products course) and must contain the following patient identification:

- First name (no abbreviations)
- Surname or family name
- Patient identification number, e.g., hospital ID number/ CHI number
- Date of birth
- Gender
- Date and time of sample taken
- Signature of person taking the sample

The form should clearly state:

- Details of obstetric history if pregnant in the last three months
- The blood transfusion requirement, type of components, special requirements and number of units or volume required
- The clinical diagnosis and indication for transfusion if different
- The date and time blood is required
- Patient's ward, consultant and location where the component is required if different
- Name and contact number of the qualified person completing the request form
- Name and signature of person undertaking venepuncture (designated nursing/midwifery staff and phlebotomists who have undertaken Safe Transfusion Practice and venepuncture and cannulation training may take blood samples for compatibility testing)
- Any transfusion history, e.g., known red cell antibodies, previous transfusions, reactions
- Samples taken in the community should specify where and when the patient will attend for transfusion
- If TrakCare is unavailable, all information should be unambiguous and written clearly on the request form.

4.13 Blood Samples for Pre-Transfusion testing

Confirmatory Sample Requirements for Transfusion

The British Committee for Standards in Haematology (BCSH) 2012 and the Serious Hazards of Transfusion (SHOT) Report 2013 recommend that a second blood sample be tested to confirm the patient's blood group prior to release of blood components from the transfusion laboratories. From 1st February 2018, this was implemented within GG&C. The measure is designed to improve patient

safety by reducing the risk of wrong blood in tube (WBIT) incidents leading to a patient receiving a potentially fatal ABO incompatible transfusion.

This ensures that your patient receives **the right blood at the right time.**

A second "confirmatory sample" will only be required if the Transfusion Laboratory does not have a historical record of a patient's blood group taken after the 1st of May 2014.

If your patient requires a confirmatory sample for blood components to be issued, you will be contacted once by the transfusion laboratory to ask for a confirmatory sample to be taken. You will then be responsible for ensuring this sample is taken and labelled beside the patient as one continuous, uninterrupted procedure following positive patient identification. Once this confirmatory sample has been received by the Transfusion Laboratory, processed and the same result concluded, the blood components will be issued.

It is ESSENTIAL that the samples are taken separately as this is the fundamental principle to reduce the risk of a WBIT incident. The two samples must be taken by two separate venepunctures, and ideally by different people at different times. Failure to follow this procedure for confirmatory sampling will not only risk harm to the patient but may lead to disciplinary action.

When a confirmatory sample is requested for a patient, provided it is taken in a timely manner, this will not lead to a delay in the issue of blood for that patient.

It is imperative to send a new request form to the Transfusion Laboratory; the confirmatory sample cannot be processed without a request form.

Emergency requests for blood components will continue to be handled using existing protocols. Group O blood will be issued in these cases until a second sample has been tested and verified. The confirmatory sample policy will not cause a delay to patients receiving blood and blood components in emergency cases.

Further information can be obtained using the link below - GGC confirmatory sample rule - Home (sharepoint.com).

Sample tube and labelling

The Blood Transfusion Department operates a **"zero tolerance" policy** for the acceptance of Blood Transfusion Requests. This policy mandates that Transfusion Requests that DO NOT meet with minimum patient identification and labelling criteria **will be rejected and a new sample requested.**

The patient's sample should be taken in an EDTA tube (pink top). A minimum of 2mls is required from neonates and 6mls from adults. Ensure the sample tube expiry date is valid before taking the sample.
The sample tube must have the following hand-written patient identification.

- First name
- Surname or family name
- Patient identification number, e.g. CHI number/ TJ number
- Date of birth
- Gender
- Ward
- Date and time of sample taken
- Signature of person taking the sample

If the patient is unknown or unidentified, the pre-transfusion sample must have the following hand-written information:

- Unknown male or female
- The unique TJ number allocated by A&E staff
- Ward or clinical area
- Date and time of sample taken
- Signature of person taking the sample

Transfusion samples must never be pre-labelled or labelled remotely from the patient.

The following procedure MUST be followed every time a blood sample is taken for pre-transfusion compatibility testing:

- The request form should be completed BEFORE the blood sample is taken and ideally taken to the bedside to allow details to be checked.
- Only one patient should be bled at a time to reduce the risk of error.
- Where the patient / carer has capacity, they must be asked to positively identify themselves / patient by giving the full name (first and last name) and date of birth prior to being bled.
- **The blood sample collection from the patient and the subsequent completion of details on the blood sample tube must be performed as one continuous, uninterrupted event at the patient's (bed) side involving one patient and one trained, competent and locally designated member of staff.**
- This must be checked against the details on the request form must match exactly.
- Identity must not and, for in-patients, the details on the patient ID band; this be assumed even for "familiar" patients who are regular attendees or long-standing in-patients.
- See section 'Positive Patient Identification' for patients who are unable to identify themselves.
- Unconscious patients must be identified by the information on their ID band. In the event of missing patient identification data from any transfusion documentation, staff must rectify this by completing the missing data before proceeding. If the patient's ID band is incomplete or there is no identification band in place, this must be rectified, and an ID band must be applied as per NHS GG&C Patient Identification Policy.
- Addressograph labels are not permitted on the sample tube.
- Once blood has been drawn, label the tube by hand with the minimum identifiers whilst still at the patient's side, taking details from the patient's ID band:
    - Surname
    - Forename
    - Date of Birth
- CHI number or other acceptable unique identifier (Emergency Number for unidentified patient)
- Please note the sample must be clearly written; labs will not accept any changes made to the handwritten sample label if an error is made.
- Pre-labelling of tubes is extremely dangerous and must be avoided.
- Addressograph labels on the sample tube will NOT be accepted – the sample must be written by hand at the bedside after blood is drawn into the sample tube.
- Always label the sample fully BEFORE taking blood from another (different) patient.
- Complete sampling procedure and send the sample to the laboratory before moving to the next patient.
- The person taking the sample must sign the sample tube.
- The person taking the sample must be satisfied that the identity of the patient matches the information on the request form, the sample tube, and (for in-patients) the patient ID band **BEFORE** signing the request form and sending the sample to the transfusion laboratory.
    If in doubt, discard the sample and bleed the patient again.

The person withdrawing the specimen is responsible for ensuring that **the blood sample from that patient is placed in the correct sample tube for that patient** and that the sample tube is in date**.** The person withdrawing the sample and signing the request form

assumes the responsibility that the sample is accurately labelled, and the relevant patient correctly identified.

In areas where ID bands would not necessarily be expected to be in place, e.g., outpatient clinics and long-stay locations, local risk-assessed policies should be in place as per NHS GG&C Patient Identification Policy.

Special requirements of transfusion

In addition to asking the patient for details, check the case notes for any transfusion history - specifically for evidence of previous transfusion reactions, presence of alloantibodies, and evidence of any previous specific requirements, if known this will be shown in the alert on TrakCare. If there is no alert on TrakCare it should not be assumed that there are no special requirements. This is only for routine non-urgent requests for blood; however, this should be checked in all cases where possible. Every effort should be made to detect any special requirements but must not delay an urgent transfusion.

Neonates: Request for infants less than 4 months old should include the full maternal and baby details, i.e., surname, forename(s), date of birth, gender and CHI number on the request form to enable the lab to link records. The neonate must receive red cells that are ABO compatible with both mother and baby.

All red cell units supplied by SNBTS (Scottish National Blood Transfusion Service) are leucodepleted and stored in SAG-M additive (saline, adenine, glucose, mannitol). Such units, containing minimal white cells and plasma, are suitable for the majority of recipients. However, specific patient groups, e.g., severely immunocompromised patients, may require separate and additional red cell specifications, such as CMV negative, or irradiated blood. Such special requirements must be clearly indicated on the request form and Blood Bank given sufficient notification, since provision of these components may take longer. Special Requirements of Transfusion (254) | Right Decisions (scot.nhs.uk)

Irradiated cellular components

Red cell, platelet or granulocyte concentrates are required when there is significant risk of the recipient developing Transfusion-Associated Graft-versus-host Disease (GVHD), an almost universally fatal condition.

Irradiated red cell concentrates may contain higher levels of extracellular potassium; thus, their shelf life is limited to a maximum of 14 days following irradiation. However, neonates who have previously received an intrauterine transfusion (IUT) and have the potential to receive large volume transfusion must receive red cells within 24 hours of irradiation. Neonates who have not received an IUT but require a red cell exchange transfusion should, where possible, be given irradiated red cells if this will not delay the transfusion. Exchange transfusion should be complete within 24 hours of irradiation. All irradiated components will have a RAD-SURE label on the unit. This must be examined to confirm the unit has been irradiated before starting the transfusion.

All platelet units are routinely irradiated.

Non-cellular blood components, e.g., FFP, Cryoprecipitate and fractionated plasma products do not require irradiation. Irradiated components not used for the intended recipient can safely be returned to stock to be used for recipients who do not require irradiated components.

Blood Bank should be informed of patients with special requirements to enter this information into the Blood Bank database. Patients requiring irradiated blood and blood components should be provided with a patient information leaflet, which can be obtained from hospital Blood Banks or SNBTS. An alert card is available within the leaflet, which should be given to the patient to highlight

the need for irradiated blood to the patient and this should be updated within the electronic patient records as per the Special Requirements policy. This requirement should be clearly marked in the patient's case notes and an alert added to TrakCare.

CMV (Cytomegalovirus) CMV can cause serious illness in certain individuals, principally pneumonia. This risk can be minimised (to 1-3%) by the use of blood components from CMV antibody-negative (seronegative) individuals. Leucodepletion also confers some protection as the virus is transmitted by leucocytes.

See Table 3

Additional information on special requirements of transfusion can be found in the NHS GGC Special Requirements of Transfusion Policy. Special Requirements of Transfusion (254) | Right Decisions (scot.nhs.uk)

Table 3: The table below identifies the patients who have requirements for CMV seronegative and irradiated and the length of time these are required.

Condition	Cytomegalovirus (CMV) Seronegative	Irradiated	Duration for special requirements
Neonates up to 28 days post EDD	✓	*	28 days post EDD
Intrauterine Transfusion (IUT)	✓	✓**	For 6 months after 40 weeks gestation
Neonatal Exchange Transfusion (ET)	✓	✓	
All donations from first or second degree relative		✓	
Severe T lymphocyte immunodeficiency syndromes including Di George and Severe Combined Immunodeficiency	✓†	✓†	
Recipients of CAR-T Therapy		✓	For 2 weeks prior to harvest until 3 months following CAR-T cell infusion
Recipients of allogeneic haemopoietic stem cell transplantation (HSCT)		✓	From three months pre transplant to 6 months after transplant or while patient is immunosuppressed
Recipients of autologous haemopoietic stem cell transplantation (HSCT)		✓	From transplant until 6 months post-transplant
Stem cell harvesting		✓	From mobilisation or 2 weeks before the harvest (whichever is earlier) until harvest is completed
All haematological recipients of alemtuzumab (Campath, anti-CD-52)		✓ ***	Lifelong
All patients with Hodgkin's lymphoma		✓	Lifelong
All patients treated with purine analogues, e.g. fludarabine, cladribine, deoxycoformycin, clofarabine, bendamustine		✓	Lifelong
All patients with aplastic anaemia treated with immunosuppressive therapy (until lymphocyte count >1.0 x10^9/L)		✓	Lifelong
Patients with aplastic anaemia (potential stem cell transplantation)		✓	From diagnosis where there is a high likelihood of proceeding to allogeneic HSCT
Pregnant women (In an emergency standard leucocyte-depleted products should be given to avoid delay)	✓		Until delivery

Leucodepleted CMV seropositive components (CMV safe) may be used for the above patient groups in the situation of life-threatening haemorrhage
CMV seronegative components should only be used for CMV negative patients or those in whom CMV status is unknown.

*Top up transfusions in infants aged <6 months do not require irradiation unless there has been a previous IUT or if the donation is from a first or second-degree relative

**The requirement for irradiation after IUT remains until 6 months after 40 weeks gestation

***The use of irradiated blood components is not indicated following treatments with alemtuzumab using the schedule currently recommended for MS or vasculitis or indicated for patients undergoing solid organ transplantation

† Whilst a diagnosis of severe T lymphocyte immunodeficiency is considered all components transfused should be irradiated and CMV seronegative whilst further tests are being undertaken. Adults and children > 2 years without a significant history of infection do not need irradiated cellular blood components unless there is a significant history consistent with a severe T lymphocyte associated immunodeficiency

Timing of sample in relation to planned transfusion

Patients who have been transfused or have been pregnant within the three-month period before the planned transfusion may be in the process of developing red cell antibodies at the time the blood sample for pre-transfusion testing is drawn. For this reason, the following table showing sampling timing in relation to time of planned completion of the transfusion must be adhered to. This will minimise the risk of transfusing incompatible blood.

Patient Type	Sample Type Whole blood at room temperature	Whole blood at 2-8°C	Plasma at -30°C
Patient transfused or pregnant in last 3 months	Up to 48 hours	Up to 3 days*	N/A
Patient NOT transfused and NOT pregnant in last 3 months	Up to 48 hours	Up to 7 days	Up to 14 days

This is the time between the sample being taken and the completion of the transfusion. It is the responsibility of the consultant who is requesting this service to ensure that all staff are aware of the need to determine if the patient has recently been pregnant or received a transfusion. Patients who are currently pregnant are NOT suitable for prolonged storage of pre-transfusion sample. Failure to adhere to these recommendations may lead to a life-threatening transfusion reaction. In exceptional clinical circumstances, there may be a requirement to retain a sample for longer than these times. The consultant responsible for the patient's care should discuss this with the haematology consultant and a concessionary release form (available from the laboratory) must be completed.

Telephone requests for blood components

In certain circumstances a patient blood sample is not required by Blood Bank, e.g., top-up transfusions for infants < 4months old who have an existing pre-transfusion sample in Blood Bank or requirement for additional units of blood, conversion of a current 'group and save' to a cross match etc.

When contacting Blood Bank by telephone to request components, it is essential that full and correct patient identification details are given to and recorded by Blood Bank staff.

This must include:

- First name
- Surname or family name
- Date of Birth
- Patient identification number e.g. CHI number/ TJ number
- Correct location for delivery of the components

A completed request form will also be required by the laboratory before any components can be issued.

Red cell transfusion requirements

Number of units required – Blood and blood components are a limited resource and are frequently in short supply. It is, therefore, essential that excessive and unnecessary ordering be avoided.

- For many operations, the likelihood of requiring blood is low, and a "group and save" request will suffice.
- "Group and save" specimens are screened for the presence of red cell antibodies and retained in the Blood Bank as per protocol. If no antibody is detected, blood can be subsequently matched from this sample. It will take approximately 35 minutes after receipt of a telephoned request AND a fully completed request form. If antibodies are detected, this can be extended to several hours.
- If a red cell antibody is identified, the clinician will be notified, as transfusion requirements may need to be modified. Clinicians should be aware that the detection of a red cell antibody may delay the provision of blood. In some instances, for patients undergoing surgery, if an antibody is detected, compatible red cells can be made available. This should be discussed with the local blood transfusion laboratory. If transfusion is urgent e.g. major haemorrhage the lab will provide the best available option to avoid transfusion delay.
- GG&C operates a confirmatory sample policy i.e. two samples taken at different times are required for the issue of non-emergency blood to ensure the correct blood is given to the right patient. If a historical sample exists in the database, only one transfusion sample is required. Where no historical sample exists, two samples taken at different times are required to confirm the patient's blood group and to have non-emergency cross-matched blood issued for that patient.
- For patients undergoing surgical procedures requiring cross-matched blood, the number of units ordered for a proposed procedure should comply with that stated in the departmental Maximum Surgical Blood Ordering Schedule (MSBOS). Electronic issue of blood may negate the need for cross-matching blood pre-operatively where the system exists.
- Blood requirements for anaemic or bleeding patients can be difficult to predict. On average, transfusion of one unit of red cells will raise the haemoglobin by approximately 10g/L in adults. Ideal post-operative haemoglobin is a matter of debate.
- In general, post-operative patients with a Hb >100g/L do not require transfusion, while those with a Hb < 70g/L will likely require transfusion. Where major comorbidities exist, this trigger may be raised to 80. Transfusion triggers differ throughout specialties and are also influenced by patient co-morbidities. Local guidance on transfusion triggers should be followed.
- Transfusions should be avoided where alternative measures are available and appropriate (e.g., iron supplements (oral or intravenous), folate or vitamin B12 supplements, erythropoietin, cell salvage).
- Transfusion can obscure the investigation of anaemia, and if the cause of anaemia is unknown, transfusion should be avoided if possible until investigations of the underlying cause are complete. Discuss with haematology medical staff if unsure.

Transfusion Associated Circulatory Overload (TACO) is defined as acute or worsening respiratory compromise and / or acute or worsening pulmonary oedema during or up to 12 hours of transfusion, with additional features including cardiovascular system changes not explained by the patient's underlying medical condition; evidence of fluid overload and a relevant biomarker. The patients most susceptible to TACO are those with severe chronic anaemia, renal impairment, cardiac disease, and pulmonary oedema, respiratory symptoms of unknown cause, significant positive fluid balance, peripheral oedema, and hypoalbuminemia. For those at risk, consideration should be given to avoiding unnecessary transfusions where alternatives exist e.g. iron therapy, single unit transfusion and the use of diuretics with the transfusion.

The NTR's TACO checklist should be completed for each transfusion episode and the SHOT TACO risk assessment tool. Staff are encouraged 'To Think About Choosing One' when authorising and administering blood and blood products; the patient should be reviewed between each component to ensure additional components are appropriate.

A small-volume system (paedipack) is available for infants. This paedipack unit is a single adult-size unit divided into four small aliquots. If there is a possibility of an infant requiring more than one transfusion over four weeks, then a paedipack should be requested.

Dose calculation for packed red cell transfusion is:

$$\frac{\text{Desired rise in Hb (g/l) x weight (kg) x 3}}{10} \qquad \text{(usually 10-20mls/kg)}$$

Components for paediatric use should always be requested and prescribed in mls.

The timely management of TACO is essential when it occurs. Management of TACO includes the use of diuretics, oxygen and other supportive measures. There should be clear communication to the patient and with staff where an episode of TACO has occurred. The TACO investigation tool (SHOT) should be used in incident investigation.

Urgency of request

Routine requests for elective surgery or transfusion should be sent to the hospital Blood Bank at least 24 hours before the intended transfusion date and time. If there is a known positive red cell antibody screen, at least 48 hours' notice is required before the intended transfusion date and time. The timing of the sample needs to take into account any recent transfusions (see table on page 20). Date required, time, number of units, and location of transfusion will always be required.

Urgent requests for matched red cells should be notified to Blood Bank by telephone. The minimum time of matching and issuing from receipt of a new specimen is 50 minutes, and 35 minutes if specimen is already “group and saved” in the Blood Bank. It should be noted these times do not include transport to clinical area and do not apply if the patient has an antibody.

Very urgent requests may be necessary when the clinical situation dictates that it may be unsafe to wait for fully cross-matched blood. Requests for emergency transfusion support should include a phone call to the hospital transfusion laboratory advising them of the situation. (For Major Haemorrhage Activation, phone 2222)

There are two options:

- **Group-specific blood** (unmatched blood) This is blood of a group which is known to be ABO compatible with the patient’s blood but not serologically cross-matched
    - *Available within 15 minutes of receipt of a valid sample in the laboratory.*
    - *Available within 10 minutes if there is a current valid grouping sample for the patient in the laboratory and there are no red cell antibodies.*
- **Group O Rh D Negative blood** (unmatched blood)
    - *In an emergency, it may be necessary to use group O Rh D Negative blood.*

A limited supply of O Rh D Negative (O positive in QEUH) blood is available from selected blood fridges within the hospitals for life-threatening emergencies.

Transport time requires to be factored in all of the above

Table 4 – Group O Negative & O Positive units held at NHS GG&C Hospitals

Hospital Site	Location	O Neg	O Pos
Victoria ACH	Outside Clinic P	3 units	3 units
QEUH	AED Resus	4 units	8 units
QEUH	IAU	2 units	2 units
QEUH	CCU	2 units	2 units
QEUH	NEURO	2 units	2 units
QEUH	Haemobank	6 units	6 units
QEUH	Maternity	3 units	N/A
Glasgow Royal Infirmary	QEB Theatre	2 units	N/A
Glasgow Royal Infirmary	A&E	4 units	N/A
Princess Royal Maternity	Labour Ward	4 adult 4 baby	N/A
Stobhill Hospital	ACH Lab	4 units	N/A
Gartnavel General	Theatres	2 units	N/A
Royal Alexandra Hospital	In-patient theatre	4 units	N/A
Royal Alexandra Hospital	Maternity Theatres	4 adult 1 baby	N/A
Inverclyde Royal Hospital	Theatre level M	2 units	N/A
Inverclyde Royal Hospital	Out of hours level C	2 units	N/A
Vale of Leven Hospital	Theatre corridor	4 units	N/A

The appropriate Blood Bank MUST be informed immediately if any of these units are removed to allow the fridge to be restocked in case of a subsequent emergency.

NB: If clinical situation dictates, please activate your local Major Haemorrhage Protocol.

It is the responsibility of all staff to familiarise themselves with the Major Haemorrhage policy.

Blood- sparing Adjuncts:

Tranexamic Acid

Tranexamic acid is an antifibrinolytic drug which may be used to decrease blood loss in surgery and major/ obstetric haemorrhage. It may be given orally or intravenously by bolus or infusion. It should not be used in gastrointestinal haemorrhage out with use in studies.

Cell Salvage

For surgical procedures where there is a reasonable expectation of > 500 mL blood loss, cell salvage may be undertaken. This is a technique where blood lost from the surgical field (relative contraindications being the presence of infection or cancer surgery) can be aspirated into an anticoagulated bowl then washed and haemoconcentrated then given back to the patient in a bag labelled with the time collected and the patient details. Specialised equipment and training is required and documentation of the transfusion and monitoring of the patient should be performed as per the procedures documented above.

The technique may offer a reduction in the amount of allogeneic red cells used but the cells given back will contain no clotting factors or platelets. Complications may arise e.g. hypotension and these should be documented and reported in the usual way including reporting to SHOT.

Information leaflets are available.

Autologous pre-deposit

Previously it has been possible for patients to donate their own blood before an elective surgical procedure. This is not currently possible in GG&C or in Scotland.

Release, collection and storage of red cells

Release of Matched Red Cells

When compatibility testing is complete, each matched unit has a Compatibility label incorporating a traceability tag (blue section) attached, stating:

- Patient identification details
- Patient blood group
- Component type and donation number
- Date and time required
- De-reservation date
- Ward

Release of Electronic Issue Matched Red Cells

Electronic issue of red cells is in use in some areas of GG&C. Electronic issue is the term given to the issue of red cells without a serological crossmatch, which relies on the fact that if the patient's ABO and RhD groups are reliably established, and a sensitive antibody screen is negative, the possibility of issuing incompatible blood is negligible. National guidelines require the use of automated testing systems interfaced with laboratory information systems before electronic selection is used, and all results must be transmitted electronically to remove human error. Therefore, a patient is suitable for electronic issue if the following criteria have been met.

- A valid sample must be present within the current database and within its correct retention time
- The patient must have been grouped and screened twice (confirmatory sample) on the current computer system
- The age of the sample: suitability is dependent on recent red cell transfusions and is controlled by electronic issue software.
- The patient must not have any clinically significant allo or auto antibodies. The patient must not have a positive antibody screen in the latest sample.
- The patient MUST NOT have any manual testing in the last two requests. The last two samples tested must have been tested using the automated system
- The patient must not be on the exclusion list (see below)
- There is no outstanding unauthorised antibody screen on the patient

Excluded patient groups

- Patients with a positive Direct Antiglobulin Test (excluded for life until DAT is negative) Patients with clinically significant allo or auto antibodies (past or present)
- Sickle Cell Disease (SCD) patients (excluded for life)
- Post allogeneic bone marrow or transplant patients (excluded for life)
- Post solid organ transplant (excluded for one-year post transplant)
- Pregnant / been pregnant in the last 3 months
- Patients under one year of age

4.14 Collection and delivery of blood components

Blood Collection is the only part of the transfusion process for which it is mandatory for the member of staff to be competency assessed. This is a legal requirement as part of the Blood Safety & Quality Regulations 2005, which are monitored by the Medicine Healthcare Regulatory Agency (MHRA).

NB. The following criteria MUST be fulfilled before arranging the collection of the component from Blood Bank or satellite fridge:

- NTR prescribing blood
- Patient venous access in-situ
- Accurate patient ID band in-situ
- Baseline observation recorded a maximum of 60 minutes before starting the transfusion, confirming patient is fit for transfusion

Within the different hospital sites there are variations in the procedure for the collection of blood components, but those collecting components must be appropriately trained and competency assessed. Only components for one patient would be collected at any one time to decrease risk of incorrect component transfusion.

Where required, the member of staff responsible for collecting the component must be in possession of a fully completed Blood Collection Form, clearly identifying product to be collected, and including the following patient details:

- First name
- Surname or family name
- Patient identification number e.g. CHI number/ TJ number
- Date of birth
- Gender

If there is any discrepancy in the information on the tag and the patient details on the collection form, do not proceed. Staff should contact Blood Bank for clarification.

A Blood Transfusion Compatibility report is issued if there is anything staff require to be made aware of about the blood product or the patient, e.g. a blood warmer is required, or the product is irradiated. If present, this should be removed from the satellite fridge or issue fridge with the first component.

Both this report and the component should be taken immediately to the requesting area and given to the member of staff responsible for the transfusion as detailed on the collection form. The patient's details on the collection form, component type and expiry must be checked by a registered member of ward staff, who must then confirm that the correct product has been given to them. Where applicable, this member of staff should sign, date and time the collection form. Transfusion should start within half an hour of removal from controlled storage conditions and must be completed within 4 hours.

The person collecting the blood or component should collect this for only one patient at a time to reduce the possibility of errors.

Subsequent collection of blood and blood components requires a new collection form

Once red cells are removed from the blood fridge, best practice is to start transfusion within 30 minutes. If blood is out of controlled storage for over 30 minutes and the patient no longer requires transfusion, then Blood Bank must be informed as the blood will have to be discarded. However, if blood is out of controlled storage for more than 30 minutes, the transfusion can still be given **if it is completed** within 4 hours of removal from controlled storage. Staff collecting the blood/ blood components should deliver it **immediately** to the clinical area or satellite fridge as required. When the blood component arrives in the ward/clinical area, the member of staff responsible for the transfusion should ensure that the correct blood or blood component has been collected for the intended patient, i.e., the right blood for the right patient.

Any clinical urgency (e.g. major haemorrhage activation) must be relayed to staff member collecting the product to prevent unnecessary delays.

In emergency situations, it may be necessary to collect the emergency uncross-matched 'O' Negative (or 'O' Positive if at QEUH) blood that is not specifically prepared for the patient concerned. The issue of emergency stock must be controlled and documented so that patient safety and audit trails are not compromised. To assist traceability, ward staff must complete the patient's full name, D.O.B and CHI number on the blue tag, along with date and time transfused, before returning to transfusion laboratory. This should be completed only after the transfusion has been commenced.

Transfer of units of blood between hospitals

Blood being transferred with a patient to another hospital must be in a sealed insulated container, validated for the purpose and bearing the time and date at which it was removed from a blood fridge and placed in the transport box. The transport boxes and cool packs are provided by the hospital Blood Bank.

Contact your Blood Bank if the transfer of a patient is being considered and blood is required to be transferred with the patient. Blood Bank will pack the box and provide the documentation required for the transfer. The Blood Bank BMS will liaise directly with the receiving hospital Blood Bank to advise that these units are being transferred.

Only units sufficient to cover the period of transfer should be sent.

If the transport box arrives at the receiving hospital with the seal intact and blood is not required immediately, the unopened box should be sent to the receiving hospital Blood Bank, where staff will be able to check its suitability for reissue. Any paperwork relating to transferred blood which has been used in transit should be sent to the receiving hospital's Blood Bank. Any unused units from a transport box which has been opened in transit should be sent to the receiving hospital's Blood Bank on arrival. The final fate of any transferred products will be allocated to the transferring Blood Bank.

A cross-match sample from the patient should be sent to the receiving hospital's Blood Bank **as soon as the patient arrives** in the hospital, with clear communication of when, where and how much more blood is needed. It may be necessary to use emergency O Rh D Negative units as an interim measure while awaiting further units of compatible blood. If in doubt, contact the hospital's Blood Bank.

Blood should only be removed from the container while the patient is being transferred and only transfused if it can be completed within 4 hours of the stated end of validated storage time on the transport box.

Blood should only be transported in a validated temperature-controlled container with the appropriate documentation. If in doubt, contact the hospital Blood Bank.

After a blood component has been delivered to the clinical area, it should be taken to the patient's bedside, where the following procedures should be strictly followed.

4.15 Administration of Blood Components

In order to comply with European regulations (BSQR)[1], the compatibility label contains a separate traceability tag (blue section) to document that the blood component has been administered to the patient. **It is a legal requirement that this is completed once any of the unit has been administered to the patient, never before administration,** and it MUST be returned to Blood Bank by the locally agreed method so that the fate of the blood can be positively documented.

All patients receiving blood should be in a clinical area where resuscitation facilities are available. After a blood component has been removed from approved blood storage and taken to the patient's bedside the following procedures should be strictly adhered to:

- Blood components must be administered by registered medical or nursing/midwifery staff who have undergone appropriate training as per local policy
- All patients *receiving* blood or blood components must wear an ID band (or risk assessed alternative identification device), whether an in-patient or a day patient
- The NTR should be kept by the patient's bedside during a transfusion and then filed in the nursing notes section of the health record after the transfusion has been completed. The transfusion outcome including any adverse events/reactions must be recorded in the patient health records

See appendix 4 for information on Administration sets and equipment used

Use the NTR Checklist for each component transfused to ensure the following steps are completed in the right order.

If the checking process is interrupted, the entire process should restart from the beginning.

Transfusion is potentially hazardous and the patient's transfusion needs should be carefully assessed.

Transfusions at night must only proceed where there is a clear clinical indication and where there is sufficient staff to permit safe transfusion, including all required patient observations. There is a greater risk of clinical error at night so if there is no clear clinical indication to transfuse overnight, consideration should be given to deferral of transfusion to the following day. However, transfusion must be delayed if it will be detrimental to the patients care.

The indication for blood transfusion must be clearly recorded in the patient's case records. Where practical, patients should be informed of their need for transfusion and the potential risks involved, including symptoms that should be reported during transfusion. They should be given the opportunity to discuss concerns and to discuss alternatives to transfusion. All patients receiving blood components should be in a clinical area where they can be observed and where resuscitation facilities are available.

Staff who can administer blood and blood components

Blood and blood components should be administered by one registered person who has completed Safe transfusion practice **AND** received training in the Five-Step Guide to Transfusion.

As per implementing the Future Nurse / Midwife Standards, this includes student midwives in part 2 and part 3. This will also include student nurses (all fields) in part 3.

As part of the updated NMC standards, student nurses and midwives can participate in the administration and monitoring of blood components via the peripheral venous route only. This must be under the direct supervision of a registered healthcare practitioner who is competent in blood transfusion administration. Prior to this, student nurses and midwives must complete online theoretical modules, LBT, Safe Transfusion Practice and simulated practice within the Higher Education Institution (HEI).

Although student nurses and midwives can be involved in the checking and administration of blood components via the peripheral route, in all instances the registered nurse has complete professional accountability for the process.

Blood components must not be administered without a fully completed and signed NTR (or electronic equivalent) except where local protocols have been agreed, for example, ECMO therapy.

Bedside checking

All patients receiving blood or blood components must wear a patient ID band.

No ID band – No Transfusion!

The ID band must contain:

- First name
- Surname or family name
- Patient identification number e.g. CHI number/ TJ number for unidentified patients
- Date of birth
- Gender
- Ward

Misidentification of the patient at the time of blood sampling or transfusion is the most common cause of serious transfusion errors. Correct identification of patient and component are of paramount importance in ensuring safe transfusion practice. It is the responsibility of the person administering the transfusion to assess the patient's condition and ability to identify themselves.

Checking of blood components before administration must be carried out at the patient's bedside and include the patient's ID band.

- Where possible, the patient should be asked to state their full name and date of birth.
- The donation number on the blood component must be identical to the donation number on the compatibility label attached to it.
- The expiry date of the blood component must be checked; units expire at midnight and must be completed by this time.
- The component should be examined for any abnormalities, e.g., clotting, discolouration and leakage.
- If the patient is known to have special transfusion needs, e.g., CMV negative/irradiated components, the NTR must state this, and the component label should be checked to ensure that these requirements have been met.

Do not administer any blood component if there is any discrepancy identified in the above checking procedure. If there is any discrepancy noted, discuss the matter with medical staff and Blood Bank staff.

If in doubt – Ask!

Administration

The registered member of staff starting the transfusion should wear gloves appropriate to the clinical situation.

The NTR, TACO checklist and component checklist should be fully completed to mitigate any potential patient safety risks. At the end of the transfusion episode, this should be filed in the patient's case records along with the compatibility report, if issued. These documents should remain at the bedside throughout the transfusion. See Appendix 3.

- Blood must be transfused through a blood-giving set with an integral mesh filter (170-200 micron pore size). Following completion of the authorised transfusion, the giving set should be changed. For patients requiring ongoing transfusion, the giving set should be changed every 12 hours at the end of a unit.
- Platelets can be transfused through a blood administration set or through a platelet/ cryoprecipitate administration set. Administration sets used for platelets can then be used for the transfusion of blood, FFP or Cryo after a saline flush. However, platelets must not be transfused through a giving set which has previously been used for red cells or other blood components.
- It is not necessary to prime a blood/blood product giving set with any other fluid. However, 0.9% Saline (not Dextrose, etc) can be used for priming and flushing if required

- The transfusion should be started as soon as possible after a component has been removed from the blood fridge/controlled storage.
- Ask the patient to state their full name and date of birth and check that the patient's response matches the details on the patient ID band.
- Check component label attached to blood pack against the patient ID band and blood bag (blood group, donation number, expiry etc)
- Proceed if component label and patient ID band details exactly match. Do not proceed if any discrepancies and contact the laboratory for advice.
- Once the transfusion has started, the pink portion of the compatibility label should be peeled off and placed on the NTR. This label should be signed by staff checking the component and should state the time and date the transfusion was started.
- The traceability section of the compatibility label (blue tag) must be completed as soon as the transfusion has been attached to the patient and is running safely. The blue tag should be returned to Blood Bank promptly by the locally agreed route and is to ensure full traceability.
- Ensure patient has call bell and knows to inform staff if they feel unwell.

If a component has been delivered to the clinical area and a delay to transfusion is foreseen, the component should immediately be returned to the Blood Bank or the satellite fridge/ controlled storage until required. Any unit of red cells that has been out of the blood fridge in excess of 30 minutes and is not being transfused, should be returned to Blood Bank or placed in a quarantine box, which allows Blood Bank staff to discard the unit safely. Transfusion of an individual unit of blood must be complete within 4 hours of removal from controlled conditions. Platelets and Fresh Frozen Plasma are usually transfused over half an hour. If not used within 30 minutes, FFP can be returned to the main laboratory and stored for up to 24 hrs. No drugs should be added to blood or blood components. If the patient's ID band becomes inaccessible, illegible or is removed, it should be replaced immediately, as per ID policy.

Blood warmers

Occasionally patients require blood to be warmed before infusion. This is most commonly required in large-volume rapid transfusions (greater than 50 mL/kg/hr for adults or 15 mL/kg/hr for children, in exchange transfusion in infants and for patients with a cold antibody). This will be indicated on the comments section of the transfusion compatibility report form and must be noted on the NTR.

Blood should only be warmed using a commercial blood warmer according to the manufacturer's guidelines. Blood must not be warmed in any other way, for example a water bath or on a radiator etc.

Pressure cuffs

If a pressure cuff is required, the **maximum pressure** which may be applied is **300 mmHg.**

In the event of component spillage, infection control guidelines on decontamination of equipment and the environment should be consulted.

4.16 Monitoring of the patient

The **minimum*** transfusion observations for each unit are temperature, blood pressure, respiratory rate & pulse at:

- **Baseline** no more than **60 minutes prior** to the start of the unit
- **15 minutes after** the start
- **Hourly thereafter** until the unit is completed *
- At **the end** of each unit, within 60 minutes of completion of transfusion
- Contact Doctor to review if any significant changes in baseline observations

NB All blood component transfusions must be completed within 4 hours of removal from controlled storage.

In patients of all ages who are incapacitated* it is more difficult to detect signs of early transfusion reactions therefore more frequent observations may be required.

***This includes those who are ventilated, confused, sedated or unconscious**

Care and monitoring of patients being transfused with blood or blood components.

The care and monitoring of a patient during transfusion is essential to ensure safety. Patients receiving transfusions should be monitored closely for signs of potential complications in order that they are dealt with promptly and efficiently. Severe reactions during transfusion are most likely to occur within fifteen minutes of the start of each unit of blood or blood component. Therefore, it is essential that close observation of the patient is maintained during this period. Adverse reactions may be seen with all blood components and monitoring of patients receiving red blood cells, platelets, FFP or cryoprecipitate is essential.

TACO may present as acute or worsening respiratory compromise or pulmonary oedema developing during or up to 12 hours after a transfusion so continued vigilance is essential.

Observations

- Before starting the transfusion and where it is possible, briefly explain the procedure to the patient/carer. Record baseline observations of blood pressure (BP), temperature (T), pulse(P), oxygen saturations (SpO_2) where possible and respiratory rate (RR) on the National Early Warning System (NEWS) and highlight as ' transfusion observations' no more than 60 minutes prior to starting the unit.
- Advise the patient/carer, where possible, to notify staff immediately if they become aware of any reactions such as flushing, rashes, light-headedness, shivering, shortness of breath or pain in extremities/ loins. Ensure the patient/carer has a nurse call button and knows how to use it.
- For patients who are not able to call for help if symptoms arise, consideration should be given to nursing them in an appropriate area where they can be readily observed rather than a side room or by performing observations more frequently.
- Transfusions should be given in areas where the patient can be readily observed by the clinical staff and during daytime hours whenever possible.
- In patients of all ages who are incapacitated it is more difficult to detect signs of early transfusion reactions therefore more frequent observations may be required. This includes those who are ventilated, confused, sedated or unconscious.
- It is essential that a full set of observations are carried out fifteen minutes after starting the transfusion then hourly thereafter until the unit is completed.
- Additional observations may be necessary if the patient is unstable or appears to be experiencing an adverse reaction, or as required by the patient's underlying clinical condition.
- Once a blood component transfusion has commenced, it is highly recommended that the patient remains in the same clinical area until the component has been fully transfused. Exceptions would be in a critically ill bleeding patient. Who required transfer to e.g. theatre or ITU.
- All in-patients should continue to be observed for signs of a transfusion reaction for the 24 hours following transfusion. Transfusion Reaction Management (sharepoint.com)
- Patients transfused as a day case, or patients discharged soon after transfusion (within 24 hours), should be provided with a post transfusion advice slip which advises them to look out for any symptoms which might be due to a transfusion reaction and includes space to provide a contact telephone number which they can call should they have any concerns.

- Additional recordings are at the discretion of each clinical area but are essential if the patient is unstable or if they appear to be experiencing an adverse reaction.
- A full set of observations must be recorded within 60 mins of completion of the transfusion.
- Throughout the transfusion, the patient should be closely observed for signs of incompatibility such as flushing, vomiting, diarrhoea, dark urine, itching, fever, rigor, headache, collapse and circulatory failure.
- Should any reaction be noted, the transfusion must be stopped immediately and advice sought from medical staff. Transfusion reaction forms can be obtained from Staffnet and should be completed and returned to Blood Bank as soon as possible with the component.
- Contact doctor to review if any significant changes to baseline observations. Transfusion Reaction Management (sharepoint.com)

4.17 Completion of transfusion

On completion of the transfusion all blood/blood component bags should be disposed of in an orange waste bag as per waste policy.

The only exception to this rule is if there has been a suspected transfusion reaction. In this situation the unit being transfused at time of reaction and any remaining unused units must be returned, along with the giving set, to the Blood Bank immediately. A fresh cross-match sample is required for investigation of the reaction. A transfusion reaction form must be completed and is available from the hospital Blood Bank or Transfusion Reaction Management (sharepoint.com).

Following commencement of the transfusion ensure the pink adhesive traceability label has been completed and secured to the NTR and the blue traceability tag has been returned to the transfusion laboratory see Appendix 3. The compatibility form and fully completed NTR should be filed in the patient's medical notes if no other components are required (ensure the completion time for each component is clearly charted). Record in the patient's health record whether or not the transfusion achieved the desired effect, along with the management and outcome of any transfusion reactions or adverse events.

At discharge, ensure the patient and the patient's GP is informed that the patient has received a transfusion, and therefore no longer eligible to donate blood.

5.0 Appendices

Appendix 1 Training matrix – from SNBTS TT

'Once for Scotland' approach to Transfusion Education

NHS National Services Scotland

SNBTS Transfusion Team Training Matrix aligned to roles

Learn Blood Transfusion (LBT) Module	Registered Nurse	Registered Midwife	Nurse / Non Medical Authoriser	ODP	Consultant & SAS Doctor	Doctors in training	GP covering community hospitals	Nurse in community hospital	BMS in Transfusion	MLA in Transfusion	Porter	HCSW & MCA	Phlebotomist	Student Nurse	Student Midwife	Medical Student
Safe Transfusion Practice	M	M	M	M	M	M	M	M	M			M		M	M	M
Safe Transfusion Laboratory Practice									M	M						
Safe Transfusion Practice for Paediatrics	M		M	M	M	M								M	M	M
Blood Components and Indications for Use	M	M	M	M	M	M	R	R	M					R	R	R
Anti D Clinical Module		M			M - Mandatory if working in obstetrics	M - Mandatory if working in obstetrics									M	
Acute Transfusion Reactions	M	M	M		M	M	M	M						M	M	M
Consent for Transfusion	R	R	M		M	M	M	R						M	M	M
Learn Cell Salvage				M	M											
Nurse Authorisation/NMABT			M													
Anti D Laboratory Module									M							
GMP for Blood Establishments*									M	M						
GMP for Hospital Blood Banks*									M	M						
Blood Collection Pathway**											M	M				
Phlebotomy Pathway***	M	M										M	M			
Safe Blood Sampling for Transfusion Video	M	M		R		M	R	M				M	M	M	M	M

* course relevant to staff working in either a blood establishment or a blood bank
** for staff only involved in the blood collection procedure who have not completed LBT: safe transfusion practice as mandatory training
*** for staff only involved in the sampling procedure who have not completed LBT: safe transfusion practice as mandatory training

KEY
M - Mandatory for role
M - Mandatory if working in obstetrics
M - Mandatory if appropriate to role / clinical area
e.g. Paediatrics, A&E, Theatres, Critical Care, Haematology, cell salvage
R - Recommended for this role

Abbreviations	
ODP	Operating Department Practitioner
BMS	Biomedical Scientist
MLA	Medical Laboratory Assistant
HCSW	Health Care Support Worker
MCA	Maternity Care Assistant
SAS	Speciality and Associate Specialists

NHS Board Transfusion Committees are asked to use professional judgement in relation to mandatory training for specific staff roles where no transfusion requirements exist.

2020-04-24SNBTSTT_LBTTrainingMatrix_Version1.2_ReviewDecember2021

Endorsed by the Scottish Clinical Transfusion Advisory Committee November 2019

Appendix 2 Roles & Responsibilities

Only staff who have completed the relevant *Learnbloodtransfusion* (LBT) theory modules can participate in the stage/s of the transfusion process appropriate to their roles. Modules are available via NHS Learnpro https://nhs.learnprouk.com/ or Turas Learn available at https://learn.nes.nhs.scot/

Process/Procedure	Can be performed by	Notes
Decision to transfuse (includes consent and patient information)	Medical staff Registered nurse/midwife who has undertaken the recognised training course relating to the non-medical authorisation of blood components programme	The decision to transfuse, including the discussion with the patient, the provision of a patient information leaflet and consent to transfusion must be clearly documented on the transfusion record.
Requesting blood components from the transfusion laboratory	Medical staff, registered nurse/midwife who have undertaken specific training *or* when following an agreed protocol (such as the Maximum Surgical Blood Ordering Schedule)	Only staff who have adequate knowledge, skills, understanding and education in transfusion can request blood components for transfusion.
Pre-transfusion blood sampling	Phlebotomists, clinical support workers, registered nurse/midwife, operating department practitioner (ODP), medical staff Registered bank/agency nurse/midwife/Locum doctor Assistant Practitioners Undergraduate nursing, midwifery, medical, ODP and physician associate students must provide evidence of meeting proficiency standards and be supervised at all times	Staff can only participate in the pre-transfusion sampling procedure if evidence of competency is provided as per local training programme/agreement As above As above Undergraduate students are required to provide evidence of theory and clinical based simulation skills as part of the undergraduate training programme. For local information access mentor page of relevant Higher Education Institute which will detail the clinical

		skills guidelines or contact local Practice Education Facilitator.
Authorising blood components	Medical staff Registered nurse/midwife who has undertaken the recognised training course relating to the non-medical authorisation of blood components	Blood components are not designated as medicinal products under the Medicines Act (Ref)*. All blood components for transfusion must be authorised for the patient and the signature of the person authorising must be clearly documented on the transfusion record.
Collection of blood components for transport to the clinical area	Porters, clinical support workers, maternity care assistants, assistant practitioners, registered nurse/midwife, ODPs	Only if they have received specific training in the collection of blood components AND had undertaken a practical competency assessment (as per BSQR 2005) with a trained blood component collection assessor (SNBTS 2020)
Final (bed)side administration checking procedure	Registered nurse/ midwife, ODPs, medical staff Registered bank/agency nurse/midwife Assistant Practitioners Undergraduate nursing, midwifery, medical, ODP and physician associate students must provide evidence of meeting	BSH (2017) recommend an independent checking procedure must be carried out by at least one registered practitioner. If a double independent check is required each practitioner must perform the check at the same time but independently of each other. Must provide evidence of training and competency in the final (bed) side checking procedure. As above Must provide evidence of training and competency in the final bedside checking procedure. Undergraduate students are required to provide evidence of theory and clinical skills simulation as part of the undergraduate training programme.

	proficiency standards and be supervised at all times	For local information access mentor page of relevant Higher Education Institute which will detail the clinical skills guidelines or contact local Practice Education Facilitator.
Monitoring the transfused patient	Registered nurse/midwife, ODPs, clinical support workers, maternity care assistant or medical staff.	Only those who have completed mandatory LBT: Safe Transfusion Practice
	Registered bank/agency nurse/midwife	As above
	Undergraduate nursing, midwifery, ODP and physician associate students can participate in the monitoring of patients being transfused.	Undergraduate students are required to provide evidence of theory and clinical skills simulation as part of the undergraduate training programme. For local information access mentor page of relevant Higher Education Institute which will detail the clinical skills guidelines or contact local Practice Education Facilitator.

*Blood components are not designated as medicinal products under the Medicines Act and therefore can not legally be prescribed by any practitioner. The term prescription legally relates only to medicines listed in the British National Formulary; for blood components it is a written instruction or authorisation to transfuse or administer.

Appendix 3 Blood bag label and traceability

Confirming the transfusion - traceability

On commencement of transfusion of Red Blood Cells, Platelets, Fresh Frozen Plasma and Cryoprecipitate the Compatibility Label attached to the unit must be completed.

STOP, SEE BACK OF THIS TAG BEFORE TRANSFUSION

NHS SCOTLAND

© Scottish National Blood Transfusion Service 2005 V9

Donation No:	G101 607 597 229 N
Component:	Red Cells
Signature 1:	Date Given:
Signature 2:	Time Given:

Peel off label above and place in patient's Medical Records

Surname: MACDONALD	Forename: MORAG
DOB: 11/07/1956	Gender: FEMALE
25 HILL STREET TOWN CENTRE	
Patient Identity No: 1107560204	Date/Time Required: 01/07/2021
Patient Blood Group: O Rh POS	Component: Red Cells
Donation Number: G101 607 597 229 N	
Special Requirements:	

Once transfusion has been started, you must send the completed section below to the Hospital Transfusion Laboratory.
This is a legal requirement

Surname: MACDONALD	Forename: MORAG
Patient Identity No: 1107560204	Lab Sample No: 1803905
Donation Number: G101 607 597 229 N	
Component: Red Cells	
Date Given:	Time Given:

I confirm that the above patient received this blood component.

Sign and Print Name

Pink "peel off" part must be signed by the registered staff member checking / administering the transfusion with the sheet, which must be filed in the patient's Transfusion Record

The Blue "tear off" section MUST be completed in full by the registered member of staff administering the transfusion, and MUST be returned to Hospital Transfusion laboratory as soon as possible but always within 3 days of the transfusion. (Even if the patient only receives only a fraction of the unit of blood this still means the patient has received a transfusion).

This is to comply with European and UK law – the Blood Safety and Quality Regulations 2005.

Appendix 4 Equipment – administration sets, blood warmers, infusion devices

Blood Administration:

Blood components can be transfused through most peripheral or central venous catheters, although the flow rate is reduced by narrow lumen catheters and long peripherally inserted central catheters (PICC lines).

They should be transfused through an administration set with a 170–200 μm integral mesh filter. Paediatric administration sets with a smaller prime volume are available for small volume transfusions. Although special platelet administration sets are available, it is safe to use a standard blood administration set, but platelets should not be transfused through a set previously used for red cells as some platelet loss will occur. It is not necessary to prime or flush blood administration sets with physiological (0.9%) saline but a new administration set should be used if blood components are followed by another infusion fluid. Although there is little evidence, current guidelines recommend changing blood administration sets at least every 12 hours to reduce the risk of bacterial infection.

Blood and other solutions can be infused through the separate lumens of multi-lumen central venous catheters as rapid dilution occurs in the bloodstream. Where possible, one lumen should be reserved for the administration of blood components.

Blood warmers are most commonly required in:

- Large volume rapid transfusion i.e.
    - >50ml/kg/hour for adults
    - >15ml/kg/hour for infants
- Exchange transfusion in infants
- Patients with cold-agglutinins requiring transfusion

If a blood warmer is required, then the person responsible for the transfusion should strictly follow the manufacturer's guidelines. Blood must NOT be warmed by any other means.

Infusion devices are commonly used to achieve optimum flow rates. Always check the manufacturer's specification to ensure that the device is suitable for the infusion of blood components. Specific Blood Administration Sets must always be used when using an infusion device for transfusing patients.

In large volume rapid infusions, the use of a **pressure device** is recommended (rather than manual squeezing of blood bags). The maximum pressure that should be applied to a blood transfusion pack is 300mmHg.

6.0 Stand-alone Policies

1. Major Haemorrhage
2. Refusal of blood
3. Emergency Blood Management plan
4. Anti-D prophylaxis
5. Management of Transfusion Events & Reactions Information
6. Maximum Surgical Blood Ordering Schedules

7.0 References

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