Executive Summary

The aim of this policy is to ensure that the RIGHT BLOOD is given to the RIGHT PATIENT at the RIGHT TIME, every time.
The policy outlines the requirements for staff, including education and competency assessment, to ensure that all those involved in any stage of the transfusion process are able to achieve safe transfusion practice.
The transfusion process includes making the decision to transfuse, communication with the patient, obtaining consent, requesting blood components, taking pre-transfusion blood samples, collecting and storing blood components, administration of a transfusion, patient monitoring during and following transfusion and management of adverse reactions.

Keywords (Minimum of 5)
Blood transfusion, decision to transfuse, blood component requesting, transfusion sampling, collecting blood, practical aspects of transfusion, blood administration, transfusion monitoring, transfusion reactions

Target Audience
This policy is designed for use by all doctors, registered nurses and midwives, registered sick children’s nurses, operating department practitioners (ODPs), perfusionists, phlebotomists, healthcare support workers and porters who are involved in any stage of the transfusion process.

Associated Guidance
British Committee for Standards in Haematology (BCSH) guidelines; NICE (The National Institute for Health and Care Excellence) Guideline NG24 on Blood Transfusion 2015; Serious Hazards of Transfusion (SHOT) annual reports; “Right blood, right patient, right time” RCN (2004, revised 2013).
This document should be read in conjunction with other relevant NHS Lothian policies (as detailed on page 3 of this policy).

Next Review Date
July 2019

Approved & Ratified by
Lothian Transfusion Committee and Clinical Policy, Documentation and Information Group (CPDIG)
Date of meeting: 21st June 2016

Date issued
July 2016

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Consultant Anaesthetist and Chair of the Lothian Transfusion Committee
## Version Control

### Reviewers/contributors

<table>
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<tr>
<th>Position</th>
<th>Version Reviewed &amp; Date</th>
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<tr>
<td>Transfusion Practitioner – WGH &amp; SJH</td>
<td>Version 5 June 2016</td>
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<td>Transfusion Practitioner – RIE &amp; RHSC</td>
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## Change Record

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<th>Date</th>
<th>Author</th>
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NHS LOTHIAN
POLICY/PROCEDURE

Blood Transfusion
Clinical Policy and Procedures 2016

This policy and these procedures apply to transfusion practice for patients of all ages in NHS Lothian. For additional specific guidance on transfusion of neonates see also SMMP (Simpson Memorial Maternity Pavilion) policies (see page 46)

The Royal Hospital for Sick Children’s Hospital will be moving site in 2017. Arrangements for blood delivery, blood collection and major haemorrhage protocol management for this department will change at that time
| CONTENTS |
|---------------------------------|---|
| BLOOD TRANSFUSION CLINICAL POLICY AND PROCEDURES | 3 |
| Purpose And Scope | 3 |
| Introduction | 3 |
| Information And Advice | 3 |
| Responsibility And Accountability | 4 |
| Infection Control | 5 |
| Blood Components And Associated Storage Requirements | 6 |
| Blood Components Used In The Transfusion Of Adults | 6 |
| Blood Components Used In The Transfusion Of Neonates, Infants And Children | 8 |
| Special Requirements - CMV Negative Or Irradiated Components | 10 |
| Blood Products | 11 |
| The Transfusion Process | 12 |
| Decision To Transfuse | 12 |
| Patients Who Do Not Accept Blood Component Or Product Transfusion | 14 |
| Informed Consent | 14 |
| Patient Information Leaflets | 15 |
| Pre-Transfusion Blood Sampling And Completion Of Request Form | 16 |
| Samples For Compatibility Testing - Sample And Patient Identification | 17 |
| Requesting Blood Components | 21 |
| Documentation Of Ordered Components And Prescription / Authorisation | 21 |
| Requesting Platelets, FFP And Cryoprecipitate | 21 |
| Urgent Requirement For Red Cells | 21 |
| Emergency Requirement For Blood Components | 21 |
| Routine Requirement For Red Cells | 22 |
| Electronic Issue / Immediate Spin | 23 |
| Collecting Blood Components | 24 |
| St John’s Hospital | 24 |
| Royal Infirmary: Clinical Areas Without Own Satellite Blood Fridge | 25 |
| Royal Infirmary: Clinical Areas With Satellite Blood Fridges | 25 |
| Royal Hospital For Sick Children | 26 |
| Western General: Clinical Areas Without Own Satellite Blood Fridge | 27 |
| Western General: Clinical Areas With Satellite Blood Fridges | 28 |
| Transferring Blood | 29 |
| Practical Aspects Of Transfusion | 30 |
| Intravenous Cannulae | 30 |
| Central Lines | 30 |
| Administration Sets | 30 |
| Compatibility Of Other Infusion Fluids | 31 |
| Infusion Pumps | 31 |
| Blood Warmers | 31 |
| Use Of Pressure Devices / Rapid Infusers | 31 |
| Component Administration | 32 |
| Requirements | 32 |
| Identification Of Patient And Component Before Administration | 33 |
| Patient Monitoring And Follow Up | 35 |
| Observation | 35 |
| Discontinuation And Documentation | 37 |
| Disposal Of Used Blood Packs And Giving Sets | 37 |
| Adverse Reactions | 38 |
| Acute Haemolytic Transfusion Reaction And Septic Reactions | 38 |
| Anaphylaxis | 39 |
| Transfusion Related Acute Lung Injury (TRALI) | 39 |
| Fluid Overload During Transfusion | 40 |
| Non Haemolytic Febrile Transfusion Reactions And Allergic Reactions | 40 |
This policy has been reviewed using the evidence available in current transfusion literature (see bibliography on page 55) combined with expert transfusion opinion and reflects current best practice.

This document should be read in conjunction with the following NHS Lothian policies. All are available on NHS Lothian intranet > healthcare >

- clinical guidance > Consent Policy and Guidance for Obtaining Consent
- clinical guidance > Patient Identification Policy
- A-Z > Blood Transfusion > Policies & Procedures > Major Haemorrhage Protocol (for Royal Infirmary of Edinburgh, Western General Hospital and St John’s Hospital)
- clinical guidance > Interpreting and Translation Policy
- clinical guidance > Administration of Adrenaline (I.M.) in Life Threatening Anaphylaxis
**Purpose and Scope**

This document contains the policy and procedures, plus associated guidance, for healthcare staff dealing with blood and blood component transfusions, to ensure patient safety and the efficient use of blood stocks. It is specifically for the acute services; for the community policy see Appendix D.

Our aim is to ensure that the RIGHT BLOOD is given to the RIGHT PATIENT at the RIGHT TIME, every time.

**Introduction**

Blood transfusion, when used appropriately, can improve the length and quality of life. Nevertheless, as with any clinical intervention, there are risks associated with transfusion. Errors in the requesting, supply and administration of blood and blood components can harm patients (see The Serious Hazards of Transfusion reporting scheme (SHOT) – www.shotuk.org).

This document deals with the practical aspects of blood and blood component transfusion (red blood cells, fresh frozen plasma (FFP), platelets and cryoprecipitate) and use of blood products with particular emphasis on the confirmation of component and patient identity.

The Better Blood Transfusion Programme, now known as Better Blood Transfusion (BBT), was established in Scotland in 2003 following recommendations from the Scottish Health Executive NHSHDL(2003)19. Transfusion practitioners exist in all Scottish health boards to promote safe transfusion. The NHS Lothian transfusion practitioners can be contacted via the internal Lothian email system or via the hospital transfusion laboratories (HTL).

This policy is designed for use by all doctors, registered nurses and midwives, registered sick children’s nurses, operating department practitioners (ODPs), perfusionists, phlebotomists, healthcare support workers and porters who are involved in any stage of the transfusion process (see page 12 for a definition of the transfusion process).

**Information and Advice**

Additional information can be obtained from the hospital transfusion laboratories or by consulting the Handbook of Transfusion Medicine (5th edition, 2013 UK Blood Services) available on wards or at www.transfusionguidelines.org.uk

For more urgent advice, including about adverse reactions to blood components and requests for coagulation factor support, contact the duty haematologist via the hospital switchboard or the hospital transfusion laboratory on: RIE & RHSC Ext 27501/2; WGH Ext 31912; SJH Ext 53354.
Responsibility and Accountability

The clinical directors and associate nurse directors - and the logistics manager on each hospital site - will be responsible for ensuring that the procedures described in this document are made known to all relevant clinical staff and porters. All individuals performing any role in the transfusion process must ensure that they are aware of the procedures and are acting in accordance with them.

It is the responsibility of the practitioner requesting blood components to check the patient’s transfusion history and to ensure any special requirements are communicated to the laboratory on the request form (i.e. irradiated, HEV negative or CMV negative components) [NB In the haematology department (adults), irradiated and HEV- blood requirements are communicated to the transfusion laboratory via a specific Special Requirement Request Form – see intranet: Healthcare A-Z > Haematology > Policy Documents > Blood Transfusion Policies. In the solid organ transplant departments, HEV-blood requirements for new transplant patients are communicated to the transfusion laboratory via a specific Special Requirement Request Form].

Transfusions of blood and blood components must be prescribed / authorised by a registered medical practitioner unless in specific areas where a policy exists for nurse authorisation. Prescription administration instructions must be written in full: abbreviations and the use of symbols (e.g. ° instead of ‘hours’) must not be used. All nurses who authorise blood component transfusions must have undertaken the necessary education and development (a specific Learnpro programme is available for this purpose: this is allocated by the transfusion practitioner following approval by an individual’s line manager). Each directorate is responsible for maintaining an up-to-date record of their individual nurse authorisers.

As well as adhering to NMC and GMC professional standards, nurses and doctors are accountable to patients and to their employer for the provision of care during the transfusion process. All staff groups are required to adhere to policies and standards of practice specified by the Board and are accountable for the care they provide being appropriate to their level of knowledge and skill.

If blood components are required in an emergency in the event of a major haemorrhage at RIE / WGH / SJH, the NHS Lothian Major Haemorrhage Protocol must be activated (see NHS Lothian intranet: Healthcare > A-Z > Blood Transfusion > Policies & Procedures > Major Haemorrhage Protocol).


In the event of a major haemorrhage occurring on any of the other non-acute NHS Lothian sites, the patient should be transferred immediately to an Emergency Department.
All staff involved in the transfusion process, including porters, must have evidence of having appropriate and current (at least within last two years) Module One Safe Transfusion Practice education.

- Registered nurses, midwives and ODPs / theatre practitioners: a face to face Module One is delivered during induction. Two yearly updates of the full Module One are required every two years via Learnpro thereafter
- FY1s: face to face transfusion education is delivered during induction alongside a requirement to complete Modules One and Two via Learnpro. Two yearly updates of the full Modules One and Two are required every two years via Learnpro thereafter
- Doctors joining NHS Lothian after FY1 year: there is a requirement to complete Modules One and Two via Learnpro at induction and every two years thereafter
- Healthcare support workers: do not need to complete the full Module One – only units appropriate to their role are required (Module One contains 7 units: units 1 and 2 are mandatory for all to complete; unit 4 is required for those who take pre-transfusion blood samples; unit 5 is required for those who go to collect blood from the laboratory or a satellite blood fridge; unit 7 is required for those who may be involved in monitoring patients who are receiving a transfusion). A face to face modified Module One is delivered during induction. Two yearly updates of the relevant units in Module One are required every two years via Learnpro thereafter. A face to face transfusion session is included in the venepuncture training day for this group
- Porters: face to face transfusion sessions are provided at induction and every two years thereafter. Porter managers are required to inform the relevant transfusion practitioner of any new members of staff joining their team
- Phlebotomists: face to face transfusion sessions are provided (or relevant units within Module One via Learnpro must be completed) at induction and every two years thereafter. Managers of phlebotomists are required to inform the relevant transfusion practitioner of any new members of staff joining their team

**Infection control**

All staff involved in the handling and administration of blood components must be familiar with and adhere to the NHS Lothian Infection Control Manual. This can be accessed via the intranet; particularly:

- Section CP001 Page 43 – Management of Blood and Body Fluid Spillages
- Section CP001 Page 11 – Hand Hygiene

Additional information can be obtained from the duty infection control nurse 7 days a week 08.30 to 16.00, or out-with these times, the duty microbiologist via the hospital switchboard.
BLOOD COMPONENTS AND ASSOCIATED STORAGE REQUIREMENTS

If blood components are required in an emergency in the event of a major haemorrhage at RIE / WGH / SJH, the NHS Lothian Major Haemorrhage Protocol must be activated (see NHS Lothian intranet: Healthcare > A-Z > Blood Transfusion > Policies & Procedures > Major Haemorrhage Protocol).


In the event of a major haemorrhage occurring on any of the other non-acute NHS Lothian sites, the patient should be transferred immediately to an Emergency Department.

**Blood Components Used in the Transfusion of Adults**

<table>
<thead>
<tr>
<th>Component</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>All blood components</td>
<td>All blood components should be administered using a blood component administration set which incorporates a 170-200 micron filter</td>
</tr>
</tbody>
</table>
| Red Cells          | - red cells have a shelf life of 35 days.  
- must be stored in a designated blood refrigerator at +2 to +6°C and linked to an alarm system.  
- must never be stored in a domestic or drug fridge.  
- all red cells must be transfused within 4 hours of removal from temperature-controlled storage (i.e. within 4 hours of removal from blood fridge or within 4 hours of breaking seal on blood transit box).  
- if no longer required, or if it is foreseen that transfusion will not be possible within the required 4 hour timeframe, red cells must be returned to the transfusion laboratory within 30 minutes of initial removal from storage (to avoid the blood having to be discarded).  
- for routine transfusion a unit of red cells may be administered over 90-120 minutes.  
- patients at risk of fluid overload should be transfused more slowly with careful haemodynamic monitoring. It may be appropriate to give a diuretic (e.g. furosemide 20 mg – 40 mg orally). |
| Volume: 220-340 ml  |                                                                                                                                                    |
| Platelets          | - platelets have a shelf life of 7 days.  
- must not be refrigerated and are stored in the transfusion laboratory at +20 to +24°C with gentle agitation.  
- platelets should not be transfused through an administration set which has already been used to administer other blood components.  
- should be administered over 30-60 minutes as soon as possible. |
| Volume: Apheresis: 200 ml (mean) Pooled: 300 ml (mean) |                                                                                                                                                    |
possible after the component arrives in the clinical area.
- if no longer required, platelets should be returned as soon as possible to the transfusion laboratory.
- apheresis platelets (single donor) should be used for all individuals born on/after the 1st January 1996 where possible to reduce donor exposure.
- platelets should not be transfused through a blood warmer.

### Fresh Frozen Plasma (FFP)
- FFP has a shelf life of 36 months.
- stored in the transfusion laboratory at < -25°C.
- prior to transfusion, FFP must be thawed in the transfusion laboratory. Thawing usually takes 15-30 minutes (RIE lab keeps a small stock of pre-thawed standard FFP).
- FFP is typically transfused at a rate of 30 – 60 minutes per unit or more rapidly in bleeding patients.
- transfusion must be complete within 4 hours of issue from Blood Bank (time of issue will be written on pack).
- if no longer required, FFP should be returned as soon as possible to the transfusion laboratory.
- typical dose 12-15 ml/kg

### Standard FFP
**Volume: 274 ml (mean)**
- single donor FFP is the component of choice for most adult patients
- exceptions:
  - individuals born after 1st January 1996 (see below) use MB-FFP
  - in large volume plasma exchange e.g. TTP use SD-FFP

### MB-FFP
**Volume: 233 ml (mean)**
- single donor methylene-blue (MB) treated FFP sourced by blood services from Austria - a ‘low prevalence BSE region’ used for individuals born on/after the 1st January 1996 (MB FFP)

### SD-FFP (Octaplas LG™)
**Volume: 200 ml (standardised)**
- pooled solvent detergent (SD) treated FFP stored in the transfusion laboratory at < -18°C with a shelf-life of 48 months
- sourced commercially from ‘low prevalence BSE regions’ with an additional prion filtration step
- indications
  - in large volume plasma exchange e.g. TTP use SD-FFP
  - individuals born after 1st January 1996 where MB-FFP is not available

### Cryoprecipitate
**Volume: 189 ml (mean) (pooled unit)**
- cryoprecipitate has a shelf life of 36 months.
- stored in the transfusion laboratory at < -25°C.
- prior to transfusion, cryoprecipitate must be thawed in the transfusion laboratory. Thawing usually takes approx 15-30 minutes.
- typical adult dose is two five-donor pools. This will raise fibrinogen concentration by approximately 1 g/l in average
adult. Typically administered at 10-20 ml/kg/hr (30-60 minutes per five-donor pool).
- transfusion must be complete within 4 hours of issue from Blood Bank (time of issue will be written on pack).
- if no longer required, cryoprecipitate should be returned as soon as possible to the transfusion laboratory.
- methylene-blue (MB) treated, sourced from ‘low prevalence BSE regions’ such as the Austria is used for all individuals born on/after the 1st January 1996

### Blood Components used in the Transfusion of Neonates, Infants and Children

<table>
<thead>
<tr>
<th>Component</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All blood components</strong></td>
<td>All blood components should be administered using a blood component administration set which incorporates a 170-200 micron filter. All blood components must be calculated and prescribed in mL (not units) to avoid overtransfusion.</td>
</tr>
<tr>
<td><strong>Red Cells for neonates and infants</strong></td>
<td>All red cell transfusions: - red cells have a shelf life of 35 days. - must be stored in a designated blood refrigerator at +2 to +6°C and linked to an alarm system. - must never be stored in a domestic or drug fridge. - all red cells must be transfused within 4 hours of removal from temperature-controlled storage (i.e. within 4 hours of removal from blood fridge or within 4 hours of breaking seal on blood transit box) (NB It is recognised that in neonatal units the transfusion itself may take four hours if the maximal top up red cell transfusion volume is given at recommended safe infusion rates. Therefore, additional time is required to allow for the preparation of the transfusion in the clinical area and the final administration check. In this situation, it is recommended that there should be no more than 30 minutes between removing the component from controlled temperature storage and starting the transfusion and the transfusion itself should be completed within four hours in all cases (BCSH, 2009). - if no longer required, or if it is foreseen that transfusion will not be possible within the required 4 hour timeframe, red cells must be returned to the transfusion laboratory within 30 minutes of initial removal from storage (to avoid the blood having to be discarded). Neonatal exchange transfusion - plasma reduced whole blood in citrate phosphate dextrose (CPD) anticoagulant. - Haematocrit 0.5 - 0.6 - irradiated (unless this would unduly delay transfusion and there has been no prior intrauterine transfusion). - blood will be &lt; 5 days old, &lt; 24 hours post-irradiation. - administration rate depends on stability of baby. - refer to exchange transfusion guidelines as per local policy (see links in Appendix B).</td>
</tr>
<tr>
<td><strong>Volume:</strong> 324 ml (mean)</td>
<td></td>
</tr>
<tr>
<td><strong>Volume: depends on size of paedipak split</strong></td>
<td><strong>Top-up transfusions</strong></td>
</tr>
<tr>
<td>------------------------------------------------</td>
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</tr>
<tr>
<td>- red cells in additive solution.</td>
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</tr>
<tr>
<td>- shelf life of 35 days.</td>
<td></td>
</tr>
<tr>
<td>- each paedipak is split into 4 aliquots each with a volume of approx 50 – 70 ml.</td>
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<tr>
<td>- all paedipaks are from accredited repeat donors.</td>
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<tr>
<td>- typical dose: 10-20 ml/kg</td>
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<tr>
<td>- typical administration rate 5 ml/kg/h</td>
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<thead>
<tr>
<th><strong>Red cell transfusion for children &gt; 1 year age</strong></th>
<th><strong>Top-up transfusions</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Volume:</strong> 220-340 ml</td>
<td>- typical dose: 10-20 ml/kg but usually not more than 1 unit of red cells</td>
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<td>- typical administration rate 5 ml/kg/h (usual max rate: 150 ml/hr)</td>
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<thead>
<tr>
<th><strong>Platelets</strong></th>
<th><strong>Details</strong></th>
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<tr>
<td><strong>Volume:</strong></td>
<td>- platelets have a shelf life of 7 days.</td>
</tr>
<tr>
<td><strong>Neonatal: (apheresis) 55 ml (mean)</strong></td>
<td>- must not be refrigerated, are stored in the transfusion laboratory at +20 to +24°C with gentle agitation.</td>
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<td>- platelets should not be transfused through an administration set which has already been used to administer other blood components.</td>
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<td></td>
<td>- if no longer required, platelets should be returned as soon as possible to the transfusion laboratory.</td>
</tr>
<tr>
<td><strong>Full packs: apheresis 200 ml (mean)</strong></td>
<td>- apheresis platelets (single donor) should be used for all individuals born on/after the 1st January 1996 where possible to reduce donor exposure.</td>
</tr>
<tr>
<td></td>
<td>- typical administration rate 10-20 ml/kg/h</td>
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<tr>
<td></td>
<td>- platelets should not be transfused through a blood warmer.</td>
</tr>
</tbody>
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<thead>
<tr>
<th><strong>Fresh Frozen Plasma (FFP)</strong></th>
<th><strong>Details</strong></th>
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<tr>
<td></td>
<td>- FFP has a shelf life of 36 months.</td>
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<tr>
<td></td>
<td>- stored in the transfusion laboratory at &lt; -25°C.</td>
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<tr>
<td></td>
<td>- prior to transfusion, FFP must be thawed in the transfusion laboratory. Thawing usually takes 15-30 minutes (RIE lab keeps a small stock of pre-thawed standard FFP).</td>
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<tr>
<td></td>
<td>- FFP is typically transfused at a rate of 30 – 60 minutes per unit or more rapidly in bleeding patients.</td>
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<tr>
<td></td>
<td>- transfusion must be complete within 4 hours of issue from Blood Bank (time of issue will be written on pack).</td>
</tr>
<tr>
<td></td>
<td>- if no longer required, FFP should be returned as soon as possible to the transfusion laboratory.</td>
</tr>
<tr>
<td></td>
<td>- typical dose: 10-20 ml/kg</td>
</tr>
<tr>
<td></td>
<td>- typical administration rate: 10-20 ml/kg/h</td>
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</tbody>
</table>

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<thead>
<tr>
<th><strong>MB-FFP</strong></th>
<th><strong>Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volume:</strong></td>
<td>- single donor methylene-blue (MB) treated FFP sourced by blood services from Austria a ‘low prevalence BSE region’ used for individuals born on/after the 1st January 1996 (MB FFP)</td>
</tr>
<tr>
<td><strong>Neonatal 56 ml (mean)</strong></td>
<td>- pooled (maximum 1520 donors) solvent detergent (SD) treated FFP stored in the transfusion laboratory at &lt; -18°C with a shelf-life of 48 months</td>
</tr>
<tr>
<td><strong>Paediatric 233 ml (mean)</strong></td>
<td>- sourced commercially from ‘low prevalence BSE regions’ with an additional prion filtration step</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SD-FFP (Octaplas LG™)</strong></th>
<th><strong>Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volume:</strong> 200 ml (standardised)</td>
<td>- sourced commercially from ‘low prevalence BSE regions’ with an additional prion filtration step</td>
</tr>
</tbody>
</table>
use in individuals born after 1\textsuperscript{st} January 1996 where MB-FFP is not available

| Cryoprecipitate | - cryoprecipitate has a shelf life of 36 months. 
| Volume of MB cryoprecipitate: 1 unit 38 ml (mean) | - stored in the transfusion laboratory at < -25°C. 
| | - prior to transfusion, cryoprecipitate must be thawed in the transfusion laboratory. Thawing usually takes 15-30 minutes. 
| | - once thawed, cryoprecipitate cannot be re-frozen. 
| | - Transfusion must be complete within 4 hours of issue from Blood Bank (time of issue will be written on pack). 
| | - if no longer required, cryoprecipitate should be returned as soon as possible to the transfusion laboratory. 
| | - methylene-blue (MB) treated cryoprecipitate, sourced from ‘low prevalence BSE regions’ such as the Austria is used for all individuals born on/after the 1\textsuperscript{st} January 1996 
| | - typical dose: 5-10 ml/kg 
| | - typical administration rate: 10-20 ml/kg/h \textendash;i.e. over approx 30 minutes. |

Special Requirements \textemdash Irradiated, Hepatitis-E Virus (HEV) Negative or Cytomegalovirus (CMV) Negative Components

Certain patients require irradiated, HEV-negative or CMV-negative components. Such patients include: some haematology patients, patients who have received a solid organ transplant, pregnant women, babies requiring intrauterine transfusion, neonates, infants and patients with certain congenital immunodeficiency states. Patient groups requiring special components can be found in Appendix C.

Whether a patient has special transfusion requirements is a clinical decision which is the responsibility of the medical team in charge of the patient’s care.

\begin{itemize}
\item \textbf{Within the Haematology (adult) department only}, for all new patients (newly diagnosed or previously unknown to department), or where there is a change in special transfusion requirement status, the transfusion laboratory should be informed of irradiated and/or HEV negative requirements using the Transfusion Special Requirement request form. The Transfusion Special Requirement request form should be completed by doctors of registrar grade or above. See haematology blood transfusion policy for detail of how this system works \textendash; intranet: Healthcare > A-Z > Haematology > Policy Documents > Blood Transfusion Policies. The Transfusion Special Requirement request form can be found at Healthcare > A-Z > Haematology > Policy Documents > Administrative Documents.
\item \textbf{Within transplant departments}, for all prospective solid organ transplant recipients, the transfusion laboratory should be informed of HEV negative requirements using the HEV Protocol Notification Form. This form is completed by the transplant coordinators.
\item \textbf{In all other departments}, the responsibility to ensure that special requirements have been ordered appropriately is with the clinician who requests the blood component/s. Special requirements must also be indicated on the patient’s transfusion prescription by the prescriber / authoriser. Where this is the case the prescription and component should be checked to ensure that these requirements have been met as part of the pre-transfusion administration check.
\end{itemize}
BLOOD PRODUCTS

The Blood Transfusion Policy provides the policy and procedures to enable staff to use blood components correctly. Blood components are the therapeutic constituents of human blood (red cells, white cells, platelets, plasma and cryoprecipitate).

In contrast, blood products are therapeutic products manufactured from human whole blood or plasma donations (e.g. albumin, anti-D, immunoglobulins).

Most blood products are stored in, and issued from, pharmacy (including intravenous immunoglobulin (IVIgG), albumin, hepatitis B immunoglobulin, tetanus immunoglobulin and varicella-zoster immunoglobulin).

The transfusion laboratories store and issue some blood products including anti-D and prothrombin complex concentrate (e.g. Beriplex). Advice can be obtained from the duty haematologist regarding site specific availability and issue arrangements for these products.

Single coagulation factor concentrates and recombinant Factor VIIa can only be given after authorisation by the duty haematologist.

Guidance regarding the use of anti-D, routine antenatal anti-D prophylaxis (RAADP) and potentially sensitising events during pregnancy and at delivery can be found in the NHS Lothian Anti-D policy found on the intranet (via Healthcare > A-Z > Reproductive Medicine > Policies & Guidelines > Maternity Pan Lothian > Antenatal).

Clinical Guidelines for Immunoglobulin Use (NHS Scotland) can be obtained from www.nsd.scot.nhs.uk (publications > guidelines). IVIgG request forms can be obtained from pharmacy.

Suspected adverse reactions to blood products should be reported through the Yellow Card Scheme (found at back of the British National Formulary (BNF)). Such reactions should also be discussed with a member of the hospital transfusion team as some (such as reactions associated with IVIgG) may also be reportable to the Serious Hazards of Transfusion. The reaction should also be reported on Datix (choose transfusion from drop-down menu).

The product ‘insert’ accompanying each blood product must be followed regarding the correct storage, dosage, reconstitution and administration of that product.

Blood products may only be ordered by registered medical, nursing or midwifery staff who have the appropriate knowledge to make this decision.

Blood products (see top of page for definition) should be prescribed in the patient’s medication administration chart (they should not be prescribed in the patient’s transfusion document which is only to be used for blood components).
THE TRANSFUSION PROCESS

The transfusion process includes:

- making the decision to transfuse, communication with the patient and obtaining patient consent
- requesting blood components
- taking pre-transfusion blood samples
- collecting and storing blood components
- administration of a transfusion
- patient monitoring during and following transfusion.

DECISION TO TRANSFUSE

The decision to transfuse should be made following consideration of the potential risks and benefits of, and the alternatives to, transfusion. Patient information leaflets are available and should be offered to patients who may require transfusion (see page 15 for information about how to obtain leaflets and formats available).

NICE (The National Institute for Health and Care Excellence) Guideline NG24 on Blood Transfusion, published November 2015 (found at https://www.nice.org.uk/guidance/ng24), makes recommendations on the transfusion of blood components and their recommendations on red cell transfusion are reproduced below:
1.2 Red blood cells

Thresholds and targets

1.2.1 Use restrictive red blood cell transfusion thresholds for patients who need red blood cell transfusions and who do not:

- have major haemorrhage or
- have acute coronary syndrome* or
- need regular blood transfusions for chronic anaemia.

1.2.2 When using a restrictive red blood cell transfusion threshold, consider a threshold of 70 g/litre and a haemoglobin concentration target of 70–90 g/litre after transfusion.

1.2.3 Consider a red blood cell transfusion threshold of 80 g/litre and a haemoglobin concentration target of 80–100 g/litre after transfusion for patients with acute coronary syndrome*.

1.2.4 Consider setting individual thresholds and haemoglobin concentration targets for each patient who needs regular blood transfusions for chronic anaemia.

Doses

1.2.5 Consider single-unit red blood cell transfusions for adults (or equivalent volumes calculated based on body weight for children or adults with low body weight) who do not have active bleeding.

1.2.6 After each single-unit red blood cell transfusion (or equivalent volumes calculated based on body weight for children or adults with low body weight), clinically reassess and check haemoglobin levels, and give further transfusions if needed.

*The higher transfusion threshold of 80 g/litre may also be appropriate in other patients with coronary artery disease.

An indication of the post-transfusion haemoglobin level can be obtained as early as 2 – 4 hours following completion of transfusion in stable patients. Timing of post-transfusion haemoglobin measurement should be tailored according to the clinical circumstance.

The reason for transfusion should be discussed with the patient, including valid alternatives and the option to refuse. Details should be recorded in the patient’s transfusion document, including the patient’s agreement (or from their legal guardian if not capable of informed consent) - see page 14 for detail.

Where pre-transfusion discussion is not possible, clinicians should act in the patient’s best interests, taking into account any advance directives where appropriate. The reason for transfusion should be discussed retrospectively, a patient information leaflet offered and the
discussion recorded in the transfusion document. If the patient has a current advance directive, this should be indicated clearly on the transfusion document and/or the patient’s healthcare record.

NHS Lothian guidance is available for staff who work in maternity services that may care for women who decline blood components. This is found at NHS Lothian intranet > healthcare > A-Z > reproductive medicine > policies & guidelines > maternity pan Lothian > antenatal.

See references (page 55) for British Committee for Standards in Haematology (BCSH) guidelines.

Patients who do not accept blood component or product transfusion

Refer to NHS Lothian Guidance for Obtaining Consent for Treatment / Procedure / Investigation (Healthcare > Clinical Guidance > Guidance for Obtaining Consent), particularly the section relating to treatments that may be acceptable/unacceptable to Jehovah’s Witnesses and withholding of consent. The potential to develop a new policy to guide decision making in the event that an individual refuses blood transfusion in NHS Lothian is currently under discussion.

Informed Consent

Although the task of gaining written consent for a blood transfusion is not a legal requirement within the UK, there is a responsibility to ensure that the patient/guardian receives adequate information regarding their transfusion and that this is clearly documented in their transfusion document. This should include information pertaining to the risks and benefits of transfusion and the risks and benefits of not having a transfusion. Information relating to available alternatives to transfusion should be considered (e.g. iron supplementation). Verbal informed consent should be obtained and recorded in the patient’s transfusion document by the person making the decision to transfuse or the person prescribing/authorising the transfusion.

For long term multi-transfused patients it is unnecessary to re-document the individual’s consent at each transfusion episode. However this should be revisited with the patient as dictated by clinical circumstances e.g. if there has been a significant time lapse in between transfusions or if the indication for transfusion has changed.

Patients who have received a transfusion are no longer eligible to donate blood. This information is also included in the patient information leaflet (see below).

Clinical practitioners have a professional duty to ensure that they have adequate knowledge of, or access to information on, transfusion-related issues.

Staff should ensure that the patient/guardian can understand the information being provided. Information sometimes needs to be provided in a different way to ensure full understanding e.g. delivering information at a slower rate or repeating important points.
The NHS Lothian Interpreting and Translation Policy provides guidance on interpretation and translation support and can be accessed via the NHS Lothian Intranet > Healthcare > Clinical Guidance > Interpreting & Translation Policy.

**Patient Information Leaflets**

Patient information leaflets published by SNBTS are available. They can be found in all transfusing wards and departments throughout NHS Lothian. Leaflets are also available for children and parents/guardians. **Further supplies of these leaflets can be obtained by contacting the South East Blood Transfusion Service (SEBTS) Administration Office on ext 27520 / 27522.** The content of the leaflet can be viewed on NHS Lothian intranet > healthcare > A-Z > blood transfusion > blood transfusion documentation.

The transfusion information leaflet can also be made available in large print, Braille (English only), audio tape and in some different languages. **To obtain leaflets in different formats only please contact the SNBTS Public Affairs Department tel: 0141-357-7752.**

Anti-D leaflets for pregnant women who are RhD-negative can be obtained from the anti-D manufacturers (CSL Behring on 01444 447 402 or BPL on 020 89572200).
PRE-TRANSFUSION BLOOD SAMPLING AND COMPLETION OF REQUEST FORM

Mis-identification of the patient at the time of blood sampling or transfusion is the commonest cause of serious transfusion error. Correct identification of patient, sample and component are of paramount importance in ensuring safe transfusion practice.

For this reason, the transfusion laboratories in Lothian require that a patient’s blood group has been confirmed from two blood samples taken on separate occasions before issuing blood components for transfusion (for many patients, the laboratory will already have a record of the blood group from a previous sample (see detail below)).

Every patient who may require a transfusion during an in-patient or day-patient episode will wear an identity band on which is clearly recorded the patient’s correct minimum identification data (BCSH 2009; RCN 2013; NHS Lothian Patient Identification Policy 2013).

The transfusion identification minimum data set must be used at every stage of the transfusion process. This consists of the patient’s:

Surname
First name
Date of Birth
CHI number* or emergency number
Gender

*There are a small number of patients who do not have a CHI number. These include: individuals who are not registered with a GP in Scotland; patients who have been admitted to the hospital in an emergency who are yet to be identified; newborn babies who have yet to be issued with a CHI. In these instances, the laboratory will accept the 700-prefix number (or, if applicable, emergency number) as the patient’s unique identifier. Please alert the transfusion laboratory if this is the case. Patients for whom a CHI subsequently becomes available (e.g. neonates, unidentified patients) should have this applied to their identification band and then used throughout the transfusion process. Please ensure the transfusion laboratory is informed of this so that they can link transfusion records if necessary.

Requirement for confirmation of the patient’s blood group before transfusion

Before issuing blood components for transfusion, the laboratory will require that a patient’s blood group has been confirmed from two blood samples taken on separate occasions. This policy has been introduced in order to comply with national guidelines from the British Committee for Standards in Haematology (BCSH) and recommendations by the Serious Hazards of Transfusion (SHOT) which are intended to reduce the risk of transfusing components of the wrong blood group.
An exception will be made where waiting to test a second sample would impede the delivery of urgent red cells or other components.

For many patients, the laboratory will already have a record of the patient’s blood group from a previous sample. The laboratory staff will inform the requesting clinician if an additional sample is required prior to issuing blood components.

- If blood components are required urgently and the transfusion laboratory has not received and tested a pre-transfusion blood sample within the past seven days / 72 hours (please refer to page 20, section 20) then Group O negative red cells (and/or Group AB FFP and/or Group A platelets) will be issued. A sample for pre-transfusion testing should be sent urgently to the laboratory and once the test results are available, they will be used for the issue of further blood components.

- If blood components are required urgently and the transfusion laboratory has received and tested a pre-transfusion blood sample within the previous seven days / 72 hours but does not have a record confirming the patient’s blood group from a second sample, then blood components will be issued without waiting for a second sample. This will be at the discretion of the requesting member of staff. However, an additional pre-transfusion blood sample should be sent to the laboratory urgently so that the results are available if further blood components are requested.

In the case of children under the age of one year, blood components for transfusion can be issued without the blood group having been confirmed from a second sample.

**Samples for compatibility testing - sample and patient identification**

The details on the blood component request form and the sample tube are the only direct contact between the clinical area and the blood transfusion laboratory. The accuracy and completeness of this information are therefore of vital importance.

Only those staff groups authorised to take and submit samples for pre-transfusion testing i.e. doctors, registered nurses, ODPs, perfusionists, registered midwives, phlebotomists and clinical support workers trained in venepuncture, and who have completed appropriate Module One Safe Transfusion Practice education, should undertake the following procedure.

Student midwives and medical students are authorised to undertake this procedure following:
- completion of a face to face teaching session on safe transfusion sampling practice (as scheduled into standard University timetable) and
- completion of Module One Safe Transfusion Practice via Learnpro and
- are considered competent to undertake this procedure by their clinical supervisor.

Student nurses are not authorised to undertake this procedure.

1. Only one patient should be sampled at a time in order to reduce the risk of error.
2. Aim to send an adequate sample:

- Adults usually **4-5 ml** in a blue-top Monovette 4.5 ml EDTA tube
- Children **over 10 kg** **4-5 ml** in a blue topped EDTA Monovette 4.5 ml tube
- Children **under 10 kg** **1.2 ml** in blue topped paediatric EDTA 1.2 ml tube. (If the sample is from an older child with low body weight, a larger sample may be required to perform a crossmatch. Please discuss with laboratory staff if required).

The pre-transfusion sample should **not** be taken from the same limb that has an IV infusion running.

3. **Sample tubes must not be pre-labelled.** This is a potential source of misidentification of the patient’s blood which can result in a fatal haemolytic transfusion reaction.

4. In-patient and day-patients must wear an identification band.

5. Identify the patient accurately from their identification band and **ask the patient to state their surname, forename and date of birth** to confirm that their identification band is correct.

**NB:** Unconscious, sedated or confused patients, babies and small children and any other patients unable to communicate verbally **must** be identified by the information given on their identification band. This should be verified by another member of staff, relative or carer.

6. If the patient is an out-patient and therefore not wearing an identification band, the patient must be asked to positively identify themselves verbally by stating their first name, surname and date of birth. This information must be checked against their healthcare record and the transfusion request form.

7. Emergency Department (ED) patients or those admitted directly to the Medical Admissions Unit (MAU) and who cannot be reliably identified must be given an identification band with a unique 700 prefix or ED number. This number must be used to identify this patient until full personal details including the CHI number can be verified.

**NB:** In the event of a major incident, all patients will be identified by a unique major incident number applied to an arm or leg with indelible marker on admission. This number must be written onto the transfusion sample tube at the point of sampling: it will appear on the component pack tag and must be used to identify such patients for the duration of the transfusion episode, even if additional identification information subsequently becomes available.
8. It is essential that all patient identification details on the tube are clear and accurate and that patients’ names are spelled correctly and consistently. Addressograph or TRAK labels are not permitted on the sample tube. The tube must be signed and dated by the individual taking the sample, after the tube has been filled. The individual who signs the tube takes full responsibility for ensuring that the blood in the tube belongs to the individual named on the tube.

9. If mother and baby samples are required at delivery (e.g. where mother is RhD negative) the cord sample must be labelled prior to taking the mother’s sample. This reduces the risk of sample misidentification. Please refer to Appendix A for full explanation of cord sampling procedure.

10. The hospital transfusion laboratory will reject samples that do not correctly and clearly show the minimum patient identification data set (surname, first name, date of birth, CHI number and gender), the signature of the individual who has drawn the sample and the date that it was drawn. Samples that are completely unlabelled or show evidence that they have borne details of another patient will be discarded, even if these details have been completely obliterated and overwritten. Sample tubes labelled with addressograph labels will be discarded. Sample tubes or forms contaminated with blood will also be discarded.

11. Check that the information on the sample tube and request form match. The patient’s minimum identification dataset on the request form can be handwritten or an addressograph label may be used (on request form only). Every request form must include the name and signature of the requesting doctor or a senior nurse who has completed the appropriate ordering training.
For patient safety the hospital transfusion laboratory will reject request forms that do not correctly and clearly show the minimum patient identification data set (surname, first name, date of birth, CHI number and gender) and requester’s signature. The clinician who takes the pre-transfusion sample (if this is a different individual than the requester) must also sign in the designated space on the request form: This signature on the request form implies that you have ensured that the sample is accurately identified and labelled.
12. The request form should indicate the patient’s diagnosis, reason for transfusion and clinical area. If the patient is to undergo surgery, state the nature, time and date of the operation. **If the patient is pregnant this must be communicated via the request form.**

13. Where available, the transfusion history should be completed on the request form.

14. State the date and time of sampling on the request form. The transfusion laboratory may have to reject the sample/request if this information cannot be established.

15. Indicate if the patient requires irradiated, HEV or CMV negative components (see Appendix C). This is each individual requestor’s responsibility (apart from in the haematology (adult) department where a different system is used – please refer to page 10 for detail).

16. State on the request form how much blood you require. For pre-op testing this should comply with the hospital SBOS (Surgical Blood Ordering Schedule) for patients undergoing surgery, unless there are exceptional circumstances (e.g. pre-existing anaemia or bleeding, which should be stated on the request form). If in doubt, contact the local hospital transfusion laboratory who will check the current pre-op reservation tariff on the SBOS (see intranet Healthcare > A-Z > Blood Transfusion > Policies and Procedures).

17. State the date and time that the blood is required, not "as soon as possible".

18. When requesting components for infants and children it is helpful to indicate the patient’s weight in the clinical details section of the request form.

19. From 5pm the service provided by the laboratory is an emergency service only. Patients who do not have an urgent need for blood should not be cross-matched overnight unless this is unavoidable (e.g. going to theatre first thing in the morning).

20. Blood samples remain valid for 7 days at WGH, SJH and RIE (exceptions are cardiothoracic, gynaecology and orthopaedics in RIE who have a specific pre-arrangement with the blood bank - check with blood bank). However, if the patient has been transfused or pregnant at any time within the last 3 months their sample will only be valid for 72 hours. Contact the transfusion laboratory for advice. **Please note that on the RIE request form the section asking whether the patient has been pregnant or transfused within the last 3 months must be completed: if it is left blank the sample expiry will default to 72 hours.**
REQUESTING BLOOD COMPONENTS

Documentation of ordered components and prescription / authorisation

Details of all blood components ordered and the clinical/laboratory indications for the transfusion should be recorded in the patient’s healthcare record. All components should be prescribed / authorised on the NHS Lothian transfusion document.

Requesting platelets, FFP and cryoprecipitate

When platelets, FFP or cryoprecipitate are required, it may not be necessary to send a sample to the hospital transfusion laboratory if the patient’s blood group is already known. These components are blood group compatible but are not cross-matched. Requests for these components should be telephoned to the duty haematologist with a description of the relevant clinical or laboratory parameters justifying the issue (some specialist areas within RIE & WGH do not require authorisation by duty haematologist). If in doubt, contact the hospital transfusion laboratory who will redirect your call if appropriate. Administration of these components should be in keeping with national guidelines such as NICE Guideline NG24 on Blood Transfusion, published November 2015 (https://www.nice.org.uk/guidance/ng24).

Urgent requirement for red cells

Red cells can be obtained rapidly if there is a current valid transfusion sample in the hospital transfusion laboratory. Contact the transfusion laboratory directly, state how urgent the need for blood is and agree with the laboratory staff who is going to arrange urgent transport to the clinical area.

O negative blood can be issued immediately from the transfusion laboratory on request (please see ‘Emergency requirement for blood components’ below).

Emergency requirement for blood components

If blood components are required in an emergency in the event of a major haemorrhage at RIE / WGH / SJH, the NHS Lothian Major Haemorrhage Protocol must be activated (see NHS Lothian intranet: Healthcare > A-Z > Blood Transfusion > Policies & Procedures > Major Haemorrhage Protocol).


In the event of a major haemorrhage occurring on any of the other non-acute NHS Lothian sites, the patient should be transferred immediately to an Emergency Department.
All staff must be aware of the Major Haemorrhage Protocol, which should be displayed in each clinical area. If the Major Haemorrhage Protocol is activated, one person should take charge of ordering blood and communicating with the transfusion laboratory. This is especially important if several patients are involved at the same time. Please be explicit when communicating about required timescales for components during a major haemorrhage i.e. avoid using ambiguous phrases such as ‘as soon as possible’.

Supplies of emergency O Rh-D negative blood for use in life threatening haemorrhage (if required sooner than the transfusion laboratory can issue blood) are stored in:

- the satellite blood fridge at RHSC
- RIE ED satellite blood fridge
- RIE obstetrics satellite blood fridge
- SJH blood distribution fridge
- WGH, RIE and SJH transfusion laboratories (obtained directly from laboratory staff).

If emergency blood is removed from a satellite blood fridge the hospital transfusion laboratory must be informed at the earliest possible opportunity so that the unit(s) can be replaced. Additionally the member of staff in charge of the area in which the fridge is located must also be notified that the emergency blood has been utilised.

The tear off blue part of the compatibility/traceability tag on the emergency O negative component pack must be completed with recipient’s details, signed and printed by one of the checkers, the date and time recorded and returned to the hospital transfusion laboratory by the agreed method of transport to confirm transfusion.

**Routine requirement for red cells**

Issues of routinely crossmatched blood held in the hospital transfusion laboratory can be obtained on request following provision of the patient’s surname, forename, date of birth, gender and CHI number (or emergency number until CHI available). All blood components will be issued with a traceability tag.

The hospital transfusion laboratory should be informed if components are no longer required so they can be made available for other patients.

**Electronic Issue & Immediate Spin**

Electronic issue and immediate spin (‘rapid crossmatch’) are techniques used in the transfusion laboratory instead of full serological crossmatch to prepare blood for issue to patients. These techniques are not suitable for all patients and the decision as to whether blood can be released by these methods lies with the biomedical scientists in the transfusion laboratory. Not all hospital transfusion laboratories employ both of these techniques. If blood is required and the patient is not eligible for electronic issue or immediate spin, units for issue will be prepared using full serological crossmatch techniques, which take about 40 – 60 minutes from the sample being received.
**Electronic Issue (RIE only)**

This is a very effective system that allows blood to remain in the transfusion laboratory blood fridge without being reserved for a particular patient. Pre-transfusion samples should be sent in the normal manner and the laboratory will use their criteria to decide if the patient is suitable for electronic issue. Two pre-transfusion samples must have been received by the transfusion laboratory in order for a patient to be eligible for electronic issue (one must be a current valid sample, the other may be a historical sample: these two samples must have been taken on two separate occasions).

If a patient is suitable for electronic issue, and blood is required, the laboratory can provide group specific blood for that patient within five minutes of the request being received. This means that the compatible units are taken from supplies in the transfusion laboratory fridge, and so blood is issued on a ‘need to transfuse basis’ and not reserved for patients on a ‘just in case’ basis.

Generally a patient is unsuitable for electronic issue because he/she

- has antibodies or a history of antibodies
- has no historic group available
- has had a bone marrow or solid organ transplant.

**Immediate Spin (‘Rapid Crossmatch’) (WGH and SJH) (this will be reviewed pending an upgrade to the laboratory IT system)**

When a request for blood is received, the transfusion laboratory confirms the patient is suitable for blood issue by immediate spin and locates the group and save sample to test against donor cells to ensure ABO compatibility. Once this test is complete units can be issued, usually within 10-20 minutes (please check with local transfusion laboratory as time required for this process varies according to site). This technique is used at:

- WGH – all qualifying patients
- St John’s – for urgent requests only.
COLLECTING BLOOD COMPONENTS

Any member of staff involved in collecting blood components (either from the transfusion laboratory or from a satellite blood fridge) must be up to date with their mandatory transfusion education (Module One Safe Transfusion Practice) and must have had their practical competency formally assessed (required every two years). Advice regarding this can be obtained from your charge nurse, clinical lead or local transfusion practitioner.

Individuals who are not employees of NHS Lothian are not permitted to collect blood. No students are permitted to collect blood unsupervised. A student must be supervised by a staff member who has been formally assessed as competent to collect blood.

Please be aware of component storage and timing details which are available in tables on pp 6-10.

St John’s Hospital

Cross-matched red cells are placed in the blood collection fridge in the laboratory. When required for a patient, the ward staff must complete a blood component collection slip with the patient’s minimum identification dataset (surname, forename, DOB, gender and CHI number) ensuring these details match the patient’s identification band. Ward staff contact the porters who will pick up the collection slip from the ward before going to collect the blood component from the laboratory. If a porter is asked to collect and this request is being made via TRAK, the individual who generates the collection request in TRAK is responsible for checking that this request is being made for the correct patient. TRAK-generated requests are printed out in the laboratory blood fridge collection room. The details on the collection slip (whether brought from the clinical area or generated via TRAK) must then be matched against the unit to be collected. All details on the collection slip must be checked against the pack label prior to removing this unit from the fridge. The details on the blood pack must be identical to the details on the collection slip. If the details do not match, blood must not be removed and the laboratory staff contacted. The porter will remove the first pack for that patient from the transfusion laboratory fridge and document this in the blood fridge register with date, time, printed name and signature. Blood must then be delivered to the clinical area without delay.

The system for collection of FFP, platelets and cryoprecipitate is the same as above apart from these components are collected directly from transfusion laboratory staff.

Red cells are issued accompanied by a transit slip which must be completed with the date and time of removal from the blood fridge by the individual who is collecting and then dated, timed and signed by the person who receives the component in the clinical area. This completed transit slip must be returned to the transfusion laboratory along with the completed traceability tag following transfusion.
Red cells that are not used within 48 hours of the stated time will automatically be returned to stock. For blood to be held longer, please make arrangements with the transfusion laboratory.

A collection slip is not required in the event of a major haemorrhage, as the patient’s identification details will be communicated directly over the ‘phone to the transfusion laboratory staff (see Major Haemorrhage Protocol found on intranet: healthcare > A-Z > Blood Transfusion > Policies and Procedures).

**Royal Infirmary: Clinical areas without own satellite blood fridge**

Red cells held in the hospital transfusion laboratory are issued in validated transit boxes (platelets, FFP and cryoprecipitate are transported at ambient temperature) and can be obtained by telephone request following provision of the patient’s surname, forename, date of birth and CHI / ED number. The red cells in the transit box are then collected by the porters and delivered to the clinical area. Component/s must be delivered to the clinical area without delay. It is the responsibility of the receiving clinician to ensure that the correct component has been delivered for the correct patient.

Blood transit boxes must not be used for continued storage of red cells. A sealed transit box will maintain red cells at the correct temperature for a validated period of time following issue from the laboratory (please contact the relevant transfusion laboratory if required). Patient identification details must be removed from the external surface of the transit box once the contents have been removed (to ensure patient confidentiality). Red cells must be transfused within four hours of opening the box or, if no longer required, must be returned to the transfusion laboratory within 30 minutes of box opening.

**Royal Infirmary: Clinical areas with satellite blood fridges (for storage of red blood cells only)**

Staff in areas with their own satellite blood fridge must be familiar with the Lothian Satellite Blood Fridge policy (intranet: healthcare > A-Z > Blood Transfusion > Policies and Procedures).

Where the ward or department has a satellite blood fridge, red cells will normally be delivered to the ward by portering staff for storage in this fridge. Blood should be transported in boxes designated for this purpose and verified as satisfactory for transportation of blood components. This will ensure that units arrive in the clinical area in optimum condition and can be re-issued by the hospital transfusion laboratory if unused. Blood transit boxes must not be used for ongoing storage of blood components: red cells should be placed in the satellite blood fridge on receipt unless transfusion is required immediately in which case red cells must be transfused within four hours of opening the box. Patient identification details must be removed from the external surface of the transit box once the contents have been removed, to ensure patient confidentiality. If no longer required, red cells must be returned to the transfusion laboratory within 30 minutes of box opening to avoid wastage.
The clinical practitioner receiving the components is responsible for checking that they have been delivered to the correct location and for placing the units in the satellite blood fridge (red cells only) or keeping them at room temperature (non-red cell components) as appropriate. Staff placing red cells in a local satellite fridge must log details of the unit/s into the fridge register, record the date and time, and print and sign their name. If a red cell pack is found in the fridge with no entry documented on the register, this will be removed by laboratory staff and discarded due to loss of safe storage audit trail.

Staff members who are requested to collect blood from a satellite blood fridge must ensure that they go with documentation containing the patient’s minimum identification dataset (surname, forename, DOB, CHI number and gender). The patient identification details must be checked against the patient’s identification band prior to collection of the component. These details should then be checked against the pack label prior to removing this from the fridge. The details on the blood pack must be identical to the details on the collection slip. If the details do not match, blood must not be removed and the laboratory staff contacted.

Document the removal of the pack(s) by putting the time, date, printed name and signature of the person removing it into the fridge register. If no longer required, red cells must be returned to the satellite blood fridge within 30 minutes of removal, ensuring that the fridge register is completed with returned time, date and signature. If the blood pack has been out of the fridge for more than 30 minutes and is no longer required for transfusion, please contact the transfusion laboratory to arrange return.

Unused red cell units (apart from emergency O negative units) will be removed from the satellite blood fridge by the medical laboratory assistants the morning after the date required. If the clinical team wish to have the blood left in the blood fridge for longer, this can be arranged by contacting the blood transfusion laboratory staff.

**Royal Hospital for Sick Children**

Staff at RHSC must be familiar with the Lothian Satellite Blood Fridge policy (intranet: healthcare > A-Z > Blood Transfusion > Policies and Procedures).

Red cells will normally be delivered to RHSC for storage in the satellite blood fridge located in the back stairwell. The blood transfusion service van driver will deliver the blood directly to the fridge (unless requested otherwise by clinical staff) and must log details of the unit/s into the fridge register, record the date and time, and print and sign their name. If blood arrives overnight or in an emergency the van driver will deliver this directly to the clinical coordinator. Blood will be transported in boxes designated for this purpose and verified as satisfactory for transportation of blood components. This will ensure that units arrive in the clinical area in optimum condition and can be re-issued by the hospital transfusion laboratory if unused. Transit boxes must not be used for ongoing storage of blood components. A sealed transit box will maintain red cells at the correct temperature for a validated period of time following issue from the laboratory (please contact the relevant transfusion laboratory if required). Red cells should be placed in the satellite blood fridge on receipt unless transfusion is required immediately. Patient identification details must be removed from the external surface of the transit box once the contents have been removed, to ensure patient confidentiality.
Red cells must be transfused within four hours of opening the box or removal from satellite fridge. If no longer required, red cells must be returned to the satellite blood fridge within 30 minutes of box opening to avoid the unit having to be wasted, ensuring that the fridge register is completed with returned time, date and signature. If the blood pack has been out of the fridge for more than 30 minutes and is no longer required for transfusion, please contact the transfusion laboratory to arrange return. Non-red cell components must never be placed in the satellite blood fridge.

Staff members who are requested to collect blood from the satellite blood fridge must ensure that they have documentation containing the patient’s minimum identification dataset (surname, forename, DOB, gender and CHI number). The patient identification details must be checked against the patient’s identification band prior to collection of the component. These details should then be checked against the pack label prior to removing this from the fridge. The details on the blood pack must be identical to the details on the documentation taken to the blood fridge. If the details do not match, blood must not be removed and the laboratory staff contacted. Document the removal of the pack(s) by putting the time, date, name and signature of the person removing it into the fridge register. If a red cell pack is found in the fridge with no entry documented on the register, this will have to be removed by the blood transfusion van driver and discarded due to loss of safe storage audit trail.

Unused red cell units (apart from emergency O negative units) will be removed from the satellite blood fridge by the van driver the day after date of intended use unless the blood transfusion laboratory staff are specifically requested to leave particular units for longer.

Platelets, fresh frozen plasma and cryoprecipitate will be delivered directly to the clinical area (or clinical coordinator out of hours) by the van driver.

Please refer to the RHSC Major Haemorrhage Protocol for details of how blood components are delivered during an emergency. This protocol is found on the NHS Lothian intranet at healthcare > A-Z > RHSC Policies and Guidelines > Policies and Guidelines > Clinical Policies.

**Western General: Clinical areas without own satellite blood fridge**

Issues of matched red cells held in the hospital transfusion laboratory fridge can be obtained by either portering or clinical staff who must have a collection slip completed with the patient’s minimum identification dataset (surname, forename, DOB, gender and CHI number). If a clinical staff member is going to collect and is taking a paper collection slip completed in the clinical area, the individual completing the slip must ensure the details on the collection slip match the patient’s identification band. If a porter is asked to collect and this request is being made via TRAK, the individual who generates the collection request in TRAK is responsible for checking that this request is being made for the correct patient. TRAK-generated requests are printed out in the laboratory blood fridge collection room. The details on the collection slip (whether brought from the clinical area or generated via TRAK) must then be matched against the unit to be collected. The details on the blood pack must be identical to the details on the collection slip. If the details do not match, blood must not be removed and the laboratory staff contacted. Pack removal must be documented by completing the date and time, name and signature of the person removing it on the
associated issue form (arranged in alphabetical order of patient surname in pigeonholes next to blood fridge). Blood must then be delivered immediately to the clinical area in a transport bag.

The system for collection of FFP, platelets and cryoprecipitate is the same as above except that these components are collected directly from transfusion laboratory staff.

Red cells are issued accompanied by a transit slip which must be completed with the date and time of removal from the blood fridge, by the individual who is collecting, and then dated, timed and signed by the person who receives the component in the clinical area. This completed transit slip must be returned to the transfusion laboratory along with the completed traceability tag following transfusion.

A collection slip is not required in the event of a major haemorrhage as the patient’s identification details will be communicated directly over the ‘phone to the transfusion laboratory staff (see Major Haemorrhage Protocol found on intranet: healthcare > A-Z > Blood Transfusion > Policies and Procedures).

**Western General: Clinical areas with satellite blood fridges (for storage of red blood cells only)**

Staff in areas with their own satellite blood fridges must be familiar with the Lothian Satellite Blood Fridge policy (intranet: healthcare > A-Z > Blood Transfusion > Policies and Procedures).

Where the ward or department has a satellite blood fridge red cells will be delivered to the ward by portering staff for storage in this fridge. The clinical practitioner receiving the components is responsible for checking that they have been delivered to the correct location and for placing the units in the local blood fridge or keeping them at room temperature (non-red cell components) as appropriate. Staff placing red cells in a satellite fridge must log details of the unit/s into the fridge register, record the time and date, name and signature. If a red cell pack is found in the fridge with no entry documented on the register, this will have to be removed and discarded due to loss of safe storage audit trail.

Staff members who are requested to collect blood from a satellite blood fridge must ensure that they have documentation containing the patient’s minimum identification dataset (surname, forename, DOB, gender and CHI number). The patient identification details must be checked against the patient’s identification band prior to collection of the component. These details should then be checked against the pack label prior to removing this from the refrigerator. The details on the blood pack must be identical to the details on the documentation taken to the blood fridge. If the details do not match, blood must not be removed and the laboratory staff contacted. Document the removal of the pack(s) by completing the time, date, name and signature of the person removing it into the fridge register. If no longer required, red cells must be returned to the satellite blood fridge within 30 minutes of removal, ensuring that the fridge register is completed with returned time, date and signature. If the blood pack has been out of the fridge for more than 30 minutes
and is no longer required for transfusion, please contact the transfusion laboratory to arrange return.

Ward/area staff are expected to check satellite blood fridges on a daily basis and arrange for the return of unused blood components to the hospital transfusion laboratory by either clinical staff or porters.

**Transferring Blood**

**Transferring within hospital**

Once blood components have been issued to a satellite blood fridge or clinical area they should not be transferred to other locations within the hospital except when the patient is undergoing urgent transfusion during transfer. All red cells must be transfused within 4 hours of removal from temperature-controlled storage.

**Transfer of blood to another site**

It is rarely necessary to transfer blood with a patient. However, if the patient is going to be transferred to another hospital with blood, the hospital transfusion laboratory of the sending hospital must be informed immediately. Laboratory staff will prepare blood for transit and will seal it in a validated transit box along with accompanying documentation and marked with the time of dispatch. This transit box seal should not be broken unless the contents are required for transfusion.

Wards / departments must not send previously issued blood in a box that has already been issued from the transfusion laboratory.

In general, no more than 2 units are required to travel with a patient and, if crossmatched blood is not already available, O negative will be issued to avoid delay in initiating the transfer.

**Please note:** Blood components must be checked by two members of staff prior to administration. However, during inter-hospital transfer there may be a need for a single practitioner to undertake the appropriate safety checks prior to transfusion in an emergency. This is only permissible if the practitioner is registered, is up-to-date with Module One Safe Transfusion Practice education and follows all correct administration checks as detailed in this policy (please see p32). **This is the only circumstance when a single person administration check is permitted.**

**Receiving patients who have been transferred with blood**

If blood arrives with a transferred patient this should be sent to the receiving hospital transfusion laboratory without delay. If urgent transfusion is required this can go ahead as long as the blood has been transported correctly in an approved cooled transit box with appropriate documentation, once the usual patient identification and safety checks have been performed. If the transferred blood has time-expired or has been incorrectly packaged, it must not be used and the receiving hospital transfusion laboratory informed.
Medicines should never be added to blood components. No other labels should be attached to a transfusion pack.

**Intravenous Cannulae**

The minimum diameter of cannula recommended for infusion of blood in adults is 18G (green) although smaller gauge may be used. For rapid transfusion, large bore cannulae e.g. 14G (orange) are required. All blood components can be slowly infused through smaller gauge cannulae or needles. Needles as small as 23G (blue) have been used successfully for transfusion in paediatric practice. 24G (yellow) cannulae are used for neonates.

If a SmartSite® needle-free valve is in situ this **must be removed prior to rapid / emergency transfusion.** This is to ensure the required flow-rate is not impeded.

**Central Lines**

Central lines are generally suitable for transfusion of blood components; when a multi-lumen catheter is used, the lumen specified for blood components should be used for the transfusion.

Other infusion fluids should not be run simultaneously through the same lumen as the blood transfusion.

**Administration Sets**

All blood components must be transfused through a sterile blood giving set with an integral mesh filter (170-200 micron pore size). The practice of priming or flushing administration sets used for the transfusion of blood components with crystalloid fluid is unnecessary. However, crystalloid fluid may be used to check patency of the cannula prior to transfusion. Following completion of the prescribed transfusion the giving set should be changed if the subsequent infusion solution is incompatible with blood (see below). For patients requiring on-going transfusion, the giving set should be changed every 12 hours.

FFP and cryoprecipitate must be administered through a normal blood-giving set. Platelets may be transfused through a normal blood-giving set or a platelet-giving set. Platelets should not be transfused through a set that has been used for red cells or other components as this may cause aggregation.

Blood components transfused during a major haemorrhage must be administered via a wide-bore blood giving set (as opposed to a blood giving set designed to be used with an infusion pump). This is to ensure the required flow-rate is not impeded. Wide bore blood giving sets are stored in every resuscitation trolley.
**Compatibility of Other Infusion Fluids**

Usually, no other intravenous fluids or medication should be co-administered via an infusion line that is being used for a blood component (when multi-lumen central venous access devices are used it is generally safe to co-administer other therapeutic solutions through a different lumen as rapid dilution occurs in the bloodstream). Intravenous solutions which contain calcium such as Ringer Lactate or Hartmann’s solution, and calcium-containing colloids, may antagonise citrate anticoagulant and allow clots to form in the blood component. Hypotonic intravenous solutions, such as 5% dextrose in water, may cause haemolysis of red cells. Blood components should not be given through an infusion set immediately before or after calcium-containing solutions. Also red cells should not be given through an infusion set immediately before or after hypotonic solutions. The giving set may be flushed with crystalloid fluid between blood components and incompatible solutions.

**Infusion Pumps**

The manufacturer’s specification should be checked to ensure that the infusion pump used is suitable for the blood component to be given and that the giving set incorporates a 170 micron filter.

**Blood Warmers**

Some patients require blood to be warmed prior to transfusion. This is particularly required in large-volume, rapid transfusions, in exchange transfusion in infants, and occasionally in some patients with cold agglutinins. Blood should be warmed using a commercial blood warmer. Blood must not be warmed in a water bath, radiator or in a microwave. Warming should always be considered if the patient is hypothermic or at risk of becoming so. Platelets should not be transfused through a blood warmer. Blood warmers are stored in selected clinical areas (not the transfusion laboratories).

**Use of Pressure Devices / Rapid Infusers**

External pressure devices should exert pressure evenly over the entire bag, have a gauge to measure the pressure, not exceed 300 mmHg of pressure and be monitored at all times when in use.

Rapid infusers usually incorporate a blood warmer and can be used when large volumes have to be infused quickly.
COMPONENT ADMINISTRATION

REMEMBER – RIGHT BLOOD, RIGHT PATIENT, RIGHT TIME

Ensure that there is a valid prescription for the correct patient and check if any additional drugs are required (e.g. diuretics) or if the patient has any special requirements. Blood and blood components should only be administered by a registered practitioner as listed:

- A Registered Medical Practitioner (this also includes provisionally-registered FY1s)
- A Registered Nurse of band 5 or higher
- A Registered Midwife
- A Registered Sick Children’s Nurse
- A Registered Operating Departmental Practitioner

Requirements

As for "Intravenous Infusion" in the NHS Lothian Clinical Procedure Manual (see Intranet > Healthcare > Clinical Guidance > Procedure Manual).

The following extra items are required:

1. Sterile blood component administration set (it is not necessary to prime the line with crystalloid fluid).
2. Pack of blood or component (with compatibility/traceability tag).
3. Infusion device if available and suitable (refer to manufacturer’s instructions) for transfusion of blood and blood components.

Prior to commencing the transfusion of each unit, the patient must have baseline measurements taken of their temperature, respiratory rate, pulse and blood pressure (BP). These must be recorded on the patient’s NEWS (or agreed alternative) chart and clearly marked as ‘baseline’. This baseline measurement must be taken within 60 minutes prior to starting the transfusion. For information regarding patient monitoring during the transfusion please see page 35.

Identification of Patient and Component before Administration

Each pack must be checked by two members of staff, one of which must be registered (see above). (NB Please see exception note on page 29).

The other checker may be a registered member of staff or a student nurse, student midwife or student ODP, if the student has:

- received face-to-face instruction on safe blood transfusion at University
- completed Module One Safe Transfusion Practice e-learning and
- been assessed as competent to do so by their clinical mentor.
The assistant practitioners in haem-oncology (band 4) may also undertake the pre-administration check if they have received face-to-face instruction on safe blood transfusion, completed Module One Safe Transfusion Practice e-learning and been assessed as competent to do so by their line manager. They must always perform this check along with a registered member of staff.

The two individuals carrying out the pre-transfusion checking procedure should complete all the checks independently (double independent checking). Both individuals must be rigorous in carrying out the procedure - reliance on the other person may lead to errors.

The crucial final patient / pack check should be conducted with great care: this is the last opportunity to prevent a transfusion error.

1 **Identify the patient from his/her identification band. If the patient is conscious and competent, this information should be confirmed verbally with the patient by asking the patient to state their first name, surname and date of birth.**

   **NB:** Unconscious, sedated or confused patients, babies and small children and any other patients unable to communicate verbally **must** be identified by the information given on their identification band. This should be verified by another member of staff, relative or carer.

   The following information (minimum identification transfusion data set) must be checked:
   
   - Surname
   - First name
   - Date of Birth
   - Gender
   - CHI number* or emergency number (*see p16 for CHI exceptions)

2 **Check the minimum identification data set on the patient’s identification band against that on the compatibility/traceability tag attached to the component. This check must be performed at the patient’s side immediately before administering the blood component.**

   - Where a patient is identified only by an emergency number (i.e. generated for an unidentifiable / unknown patient), this number must appear on the patient’s identification band. The compatibility/traceability tag attached to the component pack must be checked to ensure that it carries the same number. When there is more than one unknown patient within the ED or MAU, particular attention must be given to ensuring these patients are identified correctly for transfusion purposes.

   - In the event of a major incident, all patients will be identified by a unique major incident number applied to an arm or leg with indelible marker on admission. This number will appear on the component pack tag and must be used to identify such
patients for the duration of the transfusion episode, even if additional identification information subsequently becomes available.

3 Check that the donation number on the compatibility/traceability tag matches the donation number on the blood component. The donation number is the 12 digit ‘G’ number.

4 Check the patient’s blood ABO group and RhD group on the compatibility/traceability tag are identical to the blood ABO group and RhD group on the blood component. In general these groups should be identical. Where this is not the case a specific comment from the transfusion laboratory staff regarding the compatibility of the component for the patient will be found on an attached card. If this comment is not found the component should not be transfused until any discrepancy has been clarified with the transfusion laboratory.

5 Check the expiry date that is printed on the main blood pack label. Blood or blood components must not be used if they are beyond their expiry date.

6 Check the component pack for signs of leaking, discolouration, clumping of cells etc. If the pack is damaged or the contents appear abnormal DO NOT PROCEED with the transfusion. Return the pack to the transfusion laboratory for investigation and replacement of the component.

7 If the patient is known to have any special transfusion needs (e.g. irradiated components) the pack labelling should be checked to ensure that these requirements have been met.

If interrupted at any point in the checking procedure STOP and start again.

If there is any discrepancy, however minor, between the patient’s identification information or known special transfusion needs and the information on the blood pack, DO NOT PROCEED. Inform the hospital transfusion laboratory immediately.

Once the two checkers are both satisfied that the component is the right one for the right patient, the registered practitioner must connect up the transfusion to the patient and commence the transfusion. Both checkers should agree the rate of transfusion and ensure that the flow rate is set correctly.

The two checkers must sign, date and time the pink section of the compatibility/traceability tag and place in the patient’s transfusion document. The tear off blue part of the tag must be signed and printed by one of the checkers, recording the date and time, and be returned to the hospital transfusion laboratory by the agreed method of transport to confirm that some or the entire unit has been transfused.

This entire process must be repeated for every unit transfused. If a pack is damaged during the process do not proceed or try to repair the pack.
PATIENT MONITORING AND FOLLOW UP

Observation

Regular visual observation and monitoring of the patient during the transfusion of blood or blood components is required to detect any adverse event as early as possible so that action may be taken. Adverse reactions may be seen with all blood components; therefore, monitoring is required even for patients receiving fresh frozen plasma (FFP), platelets or cryoprecipitate. Severe reactions most commonly present during the first 15 minutes of a transfusion and the patient should be observed most closely during this period.

Even a few millilitres of ABO incompatible blood may cause symptoms within a few minutes. Special care must be taken with patients who are unable to complain of symptoms that would raise suspicion of a developing transfusion reaction. More frequent observations may be required with these patients.

1 Prior to commencing the transfusion, explain the procedure to the patient and advise them to notify staff immediately if they become aware of any reaction such as shivering, flushing, pain or shortness of breath. Make sure the patient has a call bell readily available or is able to attract staff attention.

2 Transfusions should be given in areas where the patient can be readily observed by the clinical staff.

Transfusions should be given with the same attention to patient observations whatever the time of day or night. Transfusions at night must proceed where there is a clear clinical indication, and may be given as long as the staffing is sufficient to permit safe transfusion, including adequate pre-transfusion assessment, observations at 15 minutes after the start of each component and regular visual observation throughout the transfusion.

3 Prior to commencing the transfusion of each unit, the patient must have baseline measurements taken of their temperature, respiratory rate, pulse and blood pressure (BP). These must be recorded on the patient’s NEWS (or agreed alternative) chart and clearly marked as ‘baseline’. This baseline measurement must be taken within 60 minutes prior to starting the transfusion.

NB If a patient has a pyrexia on baseline measurement, this does not necessarily mean that the patient cannot receive their transfusion if this is clinically imperative. In this situation, the patient would need to be monitored closely during the transfusion – paying particular attention to any temperature rise above baseline and / or changes to other vital signs.
The patient’s temperature, pulse, respiratory rate and BP must be recorded 15 minutes after commencement of each unit. Continue recording temperature, pulse, respiratory rate and BP hourly as a minimum throughout the transfusion of each unit. Temperature, pulse, respiratory rate and BP must be measured again at the end of the completed transfusion episode.

If any of these measurements have altered significantly from baseline values, a transfusion reaction should be considered.

In critically-ill patients, the respiratory rate is an early and important indicator of deterioration.

For rapid transfusions and when transfusing FFP, platelets or cryoprecipitate, more frequent observations may be required.

If the patient shows any signs or symptoms suggestive of a transfusion reaction, observations (temperature, pulse, BP and respiratory rate) should be monitored and recorded and appropriate action taken.

Any routine patient observations should be continued throughout the transfusion.

Throughout the transfusion, observe the patient for any sign or symptom of incompatibility or adverse reaction to a compatible transfusion, e.g. flushing, urticaria (‘hives’ – dark red raised itchy bumps on the skin), vomiting, diarrhoea, fever, itching, headache, haemoglobinuria (free haemoglobin in the urine giving the urine a red or dark colour), rigor, severe backache, collapse, circulatory failure. Should any of these be observed the transfusion must be stopped immediately and a doctor informed. For descriptions of all the different types of reactions that are associated with blood transfusion please see page 38.

Any suspected incompatibility or significant transfusion reaction should be investigated and the transfusion laboratory informed immediately. A transfusion reaction form (obtained from the laboratory) must be completed. The blood pack, any empty packs and giving sets should be returned to the hospital transfusion laboratory immediately in an appropriate, sealed double plastic bag. For further guidance and management of adverse reactions see page 38.

The reaction must be reported on Datix (select transfusion category).

Monitoring of infants during transfusion is not fundamentally different from adult practice. Restlessness, crying, or unexpected lethargy may all be signs of an early transfusion reaction. If there is any doubt the transfusion must be stopped and the patient assessed.

In-patients should be observed for late reactions during the subsequent 24 hours. Day-case and short stay transfused patients should be advised about the possibility of late
adverse reactions and should be given contact details so that they can access immediate clinical advice if this occurs.

8 The transfusion of a single pack of red cells must be complete within 4 hours of removal from temperature-controlled storage. Platelets, FFP and cryoprecipitate are generally infused over 30 minutes but not more than 4 hours from receiving the platelet pack or 4 hours from thawing FFP / cryoprecipitate (for further information regarding components and their storage / administration timing requirements see pages 6-10).

Discontinuation and Documentation

1. Record the volume of the blood component transfused on the fluid balance chart (or 24 hour chart). Record date and time that transfusion of each unit is completed in the patient’s transfusion document.

   In the event of blood transfusion being followed by other intravenous fluids, a change of giving set is required. It is not necessary to give a crystalloid "flush" on completion of transfusion.

2. The patient’s temperature, pulse, blood pressure and respiratory rate should be re-measured and documented on completion of the transfusion episode. This measurement must be taken within 60 minutes of the transfusion episode finishing.

3. Ensure that the blue section of the traceability tag attached to the blood component pack has been removed, fully completed and returned to the laboratory before disposal of the pack. It is essential that this is done for every component transfused to trace every blood component from donor to recipient.

4. The pink section of the traceability tag attached to the blood component pack must be removed, fully completed and placed in the patient’s transfusion document.

Disposal of used blood packs and giving sets

Blood bags should be kept on the ward until completion of the prescribed transfusion episode. If observation of the patient at completion of the transfusion reveals no evidence of an adverse reaction, the packs may be placed in the standard “clinical waste” bags for disposal.

The giving set can also be placed in clinical waste if still securely attached to the used blood bag, but if separated must go in a sharps container.
ADVERSE REACTIONS

For a quick guide to recognition and management of acute transfusion reactions please also refer to www.transfusionguidelines.org.uk Handbook of Transfusion Medicine (5th Edition) Flowchart for the Management of Acute Transfusion Reactions (Figure 5.1 page 46) found at http://www.transfusionguidelines.org.uk/transfusion-handbook/5-adverse-effects-of-transfusion/5-2-non-infectious-hazards-of-transfusion

Any adverse event experienced by a patient in association with a transfusion should be considered a possible transfusion reaction. The most commonly-observed reactions are:

- volume overload (dyspnoea, hypoxaemia, hypertension and tachycardia)
- simple (non-haemolytic) febrile or allergic type reactions (rise in temperature, rash, itch, rigors)

Rarely, reactions are severe such as anaphylaxis, haemolysis or septic shock.

When a transfusion reaction is suspected the transfusion should be stopped and the doctor notified. Following medical review, if discontinuation of the transfusion is necessary, the implicated component should be returned and the haematology registrar on-call notified (please see detailed advice below).

The first 15 minutes of a transfusion are the most critical as only a small amount of incompatible blood may cause a reaction.

Acute haemolytic transfusion reaction and septic reactions

These can develop after as little as 5-10 ml of blood have been transfused so observe the patient closely at the start of the transfusion of each unit. Special care must be taken with patients who are unable to complain of symptoms that would raise suspicion of a developing transfusion reaction; in these cases, the only signs of a reaction may be bleeding, BP changes, tachypnoea or tachycardia.

Symptoms may be – apprehension, agitation, flushing, pain at venepuncture site and pain in chest, flank or abdomen.

Signs include – fever, hypotension, microvascular ooze, haemoglobinuria, tachycardia.

- Stop transfusion.
- Inform medical staff immediately and commence appropriate resuscitation procedures.
- Recheck patient and component compatibility.
- Disconnect and take down blood component and blood administration set.
- Commence IV crystalloid infusion using new administration set.
- If patient has a significant fever (>2°C above baseline) take blood cultures, consider antibiotics and report immediately to the transfusion laboratory so that the blood services can be contacted if required to ensure that any other components from the same donation can be withdrawn from the supply chain. The decision on whether to recall components will need to be made by the haematology registrar on-call.
• For further advice consult the on-call haematologist.
• Inform transfusion laboratory and return blood component pack still attached to the administration set (with rollerclamp closed, sealed in two plastic bags). Also return all previously transfused empty packs. Hospitals outwith the RIE, WGH and St John’s should request advice from the supplying transfusion laboratory, regarding the appropriate method of transportation for returned components.
• Send a fresh sample of the patient's blood (adults and children more than 10 kg: 10 ml in blue topped Monovette EDTA tubes, children less than 10 kg: at least 2-4.5 ml in a blue topped 4.5 ml Monovette EDTA tube) and any other samples as advised by haematology staff.
• The transfusion must not be recommenced.
• Complete transfusion reaction form and return to the transfusion laboratory (form can be obtained from the transfusion laboratory).
• Document details of reaction in the patient’s healthcare record and on Datix (choose transfusion from drop-down menu).

Anaphylaxis

Features are acute collapse, hypotension and dyspnoea. It is usually caused by a reaction to a plasma protein and most commonly occurs with the administration of fresh frozen plasma or platelets.

• Treatment is urgent – stop the transfusion.
• Inform medical staff immediately and commence resuscitation.
• Disconnect and take down blood component and blood administration set.
• Give oxygen, I.M. adrenaline, nebulised salbutamol, I.V. antihistamine and other measures to maintain BP (please see page 2 or 56 for intranet links to locate the NHS Lothian Administration of Adrenaline (I.M.) in Life Threatening Anaphylaxis policy)
• Inform transfusion laboratory and send appropriate patient samples. Send serial samples to immunology for measurement of serial mast cell tryptase (plain tube) (immediate, 3 hours and 24 hours).
• The transfusion must not be recommenced.
• Complete transfusion reaction form and return to the transfusion laboratory (form can be obtained from the transfusion laboratory).
• Document details of reaction in patient’s healthcare record and on Datix (choose transfusion from drop-down menu).

Transfusion related acute lung injury (TRALI)

This rare but life-threatening complication usually develops within 2 hours of transfusion (maximum 6 hours) and is caused by antibodies in donor plasma (usually from multiparous women). Symptoms and signs are acute respiratory distress with cough, dyspnoea, pink frothy sputum, fever, hypotension and typical x-ray appearance (bilateral nodular shadowing).

• If suspected, contact on-call haematologist for advice.
• Management is to maintain the patient’s airway and treat as ARDS.
Diuretics should be avoided. Steroids are of uncertain benefit.

Document details of reaction in patient’s healthcare record and on Datix (choose transfusion from drop-down menu).

Fluid Overload during Transfusion

When too much fluid is transfused or the transfusion is too rapid, acute LVF may occur with dyspnoea, tachypnoea, non-productive cough, raised JVP, basal lung crackles, frothy pink sputum, hypertension and tachycardia.

- Stop the transfusion.
- Sit patient upright.
- Administer high concentration oxygen (at least 60%). Consider CPAP.
- Monitor oxygen saturation.
- For adults, administer furosemide 20 – 40 mg by slow IV injection for those not already taking a diuretic; 50 – 100 mg if already receiving a diuretic (max injection rate 4 mg/min). For children, administer furosemide 1 mg/kg by slow IV injection.
- Document details of reaction in patient’s healthcare record and on Datix (choose transfusion from drop-down menu).

If saturations remain < 90% despite the above measures seek anaesthetic opinion. Intravenous nitrates e.g. nitroglycerine may be considered to promote venodilatation but an arterial line should be inserted prior to their use.

Non-haemolytic febrile transfusion reactions and allergic reactions

- Stop the transfusion.
- Inform medical staff.
- Recheck patient and component compatibility.
- Commence appropriate treatment:
  - Shivering and fever 30 – 120 minutes after the start of a transfusion affect 1-2% of recipients, mainly multi-transfused or previously pregnant patients. These reactions are probably less frequent with leucodepleted components. These can usually be managed by giving an antipyretic e.g. paracetamol.
  - Urticaria and itch starting within minutes usually subside with antihistamine treatment (e.g. chlorphenamine 10 mg IV for adults; chlorphenamine maleate as per British National Formulary (BNF) for children)
- Monitor patient closely for 30 minutes:
  - If signs and symptoms respond to treatment, transfusion may be recommenced. It may be appropriate to recommence at a slower rate. The patient must continue to be monitored closely and the transfusion discontinued if signs / symptoms return.
  - If there is no improvement within 30 minutes, or if any deterioration occurs, do not re-start transfusion and treat as a severe reaction (see treatment of acute haemolytic and septic reactions on page 38).
- Document details of reaction in patient’s healthcare record and on Datix (choose transfusion from drop-down menu).
N.B. such symptoms could be the first indication of a more serious reaction so it is important to continue to monitor the patient closely.

Prophylactic pre-medication of regular transfusion recipients with an antipyretic and antihistamine may be considered. Hospital Transfusion Groups on each acute hospital site and the NHS Lothian Transfusion Committee will review all severe reactions.
REPORTING TRANSFUSION REACTIONS AND ADVERSE EVENTS

If a serious transfusion reaction or adverse event occurs, take steps to safeguard the patient. The transfusion laboratory, duty haematologist and the practitioner in charge of the clinical area must be informed.

Specific forms are available from each hospital transfusion laboratory to be completed in the event of a transfusion reaction.

The event or reaction must be logged on Datix (select transfusion category) by the clinical staff involved and be reported to the local transfusion team who will ensure that it is reported to the MHRA Serious Adverse Blood Reactions and Events (SABRE) scheme and / or to the National Serious Hazards of Transfusion (SHOT) reporting scheme. The SABRE & SHOT reporters will ensure that the information is anonymised. The staff involved in the incident will be offered support including relevant education or training as necessary.

Some clinical incidents may be identified by the laboratory e.g. failure to identify need for special transfusion requirements.

Events / reactions regarded as serious hazards include:

- incorrect blood component transfusion, including components which were intended for another patient or which did not meet appropriate requirements (e.g. irradiated, HEV-negative or CMV-negative).
- inappropriate or unnecessary transfusion.
- blood component handling and storage errors.
- anti-D related incidents.
- acute transfusion reactions (<24 hours) (ATR) - including febrile non-haemolytic transfusion reactions with temperature rise of >2°C above baseline and moderate or severe allergic reactions
- haemolytic transfusion reactions (HTR) (these might be acute or delayed).
- transfusion-related acute lung injury (TRALI).
- transfusion-associated circulatory overload (TACO).
- transfusion-associated dyspnoea (TAD).
- post-transfusion purpura (PTP).
- transfusion-associated graft versus host disease (TaGvHD).
- bacterial contamination.
- post-transfusion viral or other infection.
- autologous transfusion incidents (e.g. associated with cell salvage).

Near Miss Events

Near miss events should also be reported on Datix (choose transfusion from drop-down menu). These are defined as any errors, which, if undetected, could have resulted in the issue, collection or administration of incorrect, inappropriate or unsuitable components, but were recognised before transfusion took place. They include:
• samples labelled with the wrong patient’s personal details, or wrong details given by telephone.
• wrong component requested or special requirements incorrectly specified.
• laboratory error in patient details or results.
• laboratory error in issuing incorrect component.
• wrong component collected from laboratory or satellite blood fridge.
• incorrect transportation or ward storage.
• error in identification of patient at the time of administration of the component.

The individual identifying the error has the responsibility of ensuring it is entered on Datix. The local transfusion practitioner can provide advice.
APPENDIX A

MATERNAL AND CORD SAMPLING AT DELIVERY

It is recognised that the standard procedure for taking and labelling a transfusion sample (see page 16 of this policy) cannot be followed for cord sampling due to the unique nature of this event. There is therefore a greater risk of mislabelling the cord sample.

There are also contributory factors that can increase the chances of mixing up the cord and maternal samples at the point of delivery, for example:

- No identification band available for cord sample
- Unable to label the cord sample immediately due to ongoing management of delivery
- Mum and baby have same last name and baby may not yet have first name
- Two samples taken at similar times in a shared area, room or bed-space
- Unique identification number not issued yet for baby

The Cord Sample

Only those staff groups authorised to take and submit cord samples for pre-transfusion testing e.g. doctors and registered midwives trained in venepuncture, and who have completed appropriate Module One Safe Transfusion Practice education, should undertake the following procedure:

- **The sample tubes must not be pre-labelled.** This is a potential source of mix up between the cord and the maternal sample tubes which could result in misidentification of a blood group which could impact on the safety of subsequent transfusion or decisions about anti-D

- **The cord sample must be labelled with the baby’s identification details as soon as possible after taking the sample and always before the maternal sample is taken.** The sample must not have been out of the eyesight of the person who labels the tube. The tube must be labelled by the individual who took the sample: if this individual is unable to do so (e.g. due to being involved with ongoing management of delivery) another attending midwife can label the sample but this individual must have witnessed it being taken and not let it out of their eyesight. The following details need to be written on the tube:
  - Baby’s first name (if this is not yet available, ‘baby’ must be written. If the baby is from a multiple birth, he/she should be identified as Twin 1 or Twin 2 etc.)
  - Surname
  - Date of birth
  - Date of sample
  - Signature
• As soon as the baby is registered and their unique identification number is available, this must be added to the cord sample tube. All other identification details on the tube must be checked against the full patient identification dataset prior to adding the unique identification number.

• The cord sample tube must not bear any of the mother’s identification details (e.g. do not label as ‘baby of ....’ or write the mother’s unique identification number on the tube).

• The request form to accompany the cord sample tube must be fully completed in line with the standard request form procedure (pages 19-20). It is important to advise the laboratory of the mother’s details, via the request form, at the time of sending the sample.

• The cord sample tube and request form must be fully completed prior to taking the maternal sample.

The maternal sample

The maternal sample should be taken and labelled in accordance with the main sampling policy: please refer to page 16.
APPENDIX B

NEONATAL TRANSFUSION PRACTICE

Please also refer to Simpsons Centre for Reproductive Health (SCRH) transfusion guidelines:
- “Use of blood products”
- “Exchange transfusion”
- “Administration of blood components”

These can be accessed on the NHS Lothian intranet (Healthcare A-Z > Reproductive Medicine > Neonatal Unit > SMMP Intranet Site Link > Clinical Guidelines > Haematology).

The need for rigorous identification procedures and a strict sample labelling process, as well as robust procedures for collection and administration of blood components, applies to neonates just as it does to children and adults. Please refer to the relevant ‘decision to transfuse’, ‘sampling’, ‘requesting’, ‘collection’ and ‘administration’ sections in the main part of this policy.

PRE-TRANSFUSION SAMPLING AND COMPLETING THE REQUEST FORM FOR NEONATES

Sample Tube Labelling

Transfusion samples taken from neonates must be handwritten with the baby’s own details only: the tube must not bear any of the mother’s identification details (e.g. do not label as ‘baby of ….’ or write the mother’s unique identification number on the tube).

The hospital transfusion laboratory will reject samples that do not correctly show the minimum patient-identification data set (surname, forename (‘baby’ is acceptable in place of forename if the baby has yet to be named), date of birth, unique identification number* and gender), the signature of the individual who has drawn the sample and the date that it was drawn. Samples that are completely unlabelled or show evidence that they have borne details of another patient will be discarded, even if these details have been completely obliterated and overwritten. Sample tubes labelled with addressograph labels will be discarded.

Sample tubes or forms contaminated with blood will also be discarded.

* The baby’s unique hospital identification number is acceptable until their CHI number has been generated. This number must always be used to identify this patient until full personal details including the CHI number are available.

Request Form

In dealing with neonates who have not yet been named, it is vitally important to state on the request form the baby’s sex, surname, date of birth and unique hospital identification number (CHI number must be used when available) and the mother’s surname and first name; “baby” should be stated as baby’s forename. If the baby is from a multiple birth, he/she should be identified as Twin 1 or Twin 2 etc. and this should be applied consistently.
to each request, even if one of the babies dies. When the child is named, the hospital transfusion laboratory should be informed that, for example, Twin 1 Smith is now Jack Smith. This will enable the staff to link the baby’s previous results with the new identity.

It is important to advise the laboratory of the mother’s details, via the request form, at the time of sending the first sample from a child under 4 months of age (e.g. add comment ‘baby of Jennifer Smith, DOB 12.12.82’) as the laboratory may have relevant details of the mother’s antibody status. If you know from the antenatal notes that the mother has a red cell antibody, state this on the request form.

**ADMINISTERING BLOOD AND BLOOD COMPONENTS TO NEONATES**

Particular care should be taken in the identification of neonates. The gender of an infant lying in an incubator may not be immediately apparent and the identification band may not carry a first name. Twins and triplets may differ only in their hospital identity number. The unique hospital identity/CHI number on the baby’s identification band (in addition to the baby’s surname, first name (if present), date of birth and gender) should be checked against the blood pack and accompanying documentation when undertaking the pre-administration checking procedure.

In neonatal units, transfusion may take four hours if the maximal top up red cell transfusion volume is given at recommended rates. Therefore, additional time is required to allow for the preparation of the transfusion in the clinical area and the final administration check. In this situation, it is recommended that there should be no more than 30 minutes between removing the component from controlled temperature storage and starting the transfusion and the transfusion itself should be completed within four hours in all cases.

Any infusion device used must be suitable for transfusion of blood components. Syringe drivers are suitable for neonatal transfusion. A suitable macroaggregate filter with a mesh size of 170-200 μm must be incorporated. This may be inserted between the bag and the syringe during the syringe filling or between the syringe and the IV access device. Microaggregate filters (pore size 40 μm) are also suitable but unnecessary if a 170-200 μm is available.

**Paedipaks**

Infants can receive up to four transfusions from a single donor. This reduces the risk of disease transmission by reducing the number of donor exposures.

The paedipaks are made by sterile docking four satellite packs onto the primary blood component. This yields a total of four packs (aliquots), which will have the same donation number, but also with individual product codes with a subscript of 1-4. When the hospital transfusion laboratory is requested to allocate an infant to the paedipak system a divided donation which is within the first 7 days of its shelf-life will be selected. Aliquots will continue to be issued from this time until the normal expiry date (35 days). Each aliquot will have a volume of approximately 50-70 ml. If the remainder of the donation is not required
for a particular infant after the first one or more aliquots have been issued the remainder of the donation will be discarded.

The infants who will benefit from this system are those receiving more than one transfusion within a 4-5 week period. Generally these are infants with a birth weight of less than 1.5 kg or conditions such as necrotizing enterocolitis (NEC), sepsis, etc. The requesting doctor should specify the need for paedipaks for those infants judged to be in one of the above groups. Infants can be entered into the system even if they have already had a transfusion which has not been from a paedipak system – it may only become clear at a later date that the transfusion requirements were likely to be high. At the time of the initial request, a sample from the infant (and another sample from the infant’s mother, if possible) should be sent to the hospital transfusion laboratory specifying on the request form that the infant is to receive a paedipak (please see page 46 for information on sample tube labelling).

As infants who have been allocated to a paedipak system will be receiving group O red cells, further samples for group and screen will only be required if the child is over four months old. Requests for further units can be made by telephone to the transfusion laboratory giving the patient’s details. The units supplied will be CMV-negative, HEV-negative and leucodepleted: these special requirements therefore do not need to be specified on the associated request form.

A second sample from the infant may be required prior to the selection of a new donation (e.g. once all four aliquots have been used).

- Paedipaks can be issued for children up to one year old or approx 10 kg.
- All paedipaks are from accredited repeat donors.

**T-antigen Activation**

Infants with necrotising enterocolitis can develop exposure of a normally hidden red cell antigen (T-antigen) and this may lead to a risk of haemolysis if adult plasma (which contains anti-T) is given. The precise link between T-antigen exposure (T-activation) and haemolysis is uncertain. There is currently no consensus either with respect to the frequency of T-activation or the clinical significance of this finding in infants. These babies can receive red cells in optimal additive solution as very little plasma is present in these. Platelets, FFP and/or cryoprecipitate should only be administered when clearly indicated. Any patient with NEC who develops haemolysis should be investigated to determine the cause of this. This should include a lectin test to look for T-activation. Where it is felt the T-activation is the likely cause, then an exchange transfusion may be necessary. In babies with probable T-activation and evidence of haemolysis then low titre anti-T components should be used. Access to these components is very limited.

Requirements for blood components, particularly platelets, FFP and cryoprecipitate, in patients with probable T-activation MUST be discussed with the transfusion specialist on-call as soon as possible as special components may be needed.
**Intrauterine transfusion**

This procedure is carried out at the Queen Mother’s maternity unit in Glasgow; all patients requiring intrauterine transfusion are transferred to this unit.

**Exchange transfusion**

The British Committee for Standards in Haematology (BCSH) recommends that neonates undergoing an exchange transfusion should receive plasma-reduced red cells in citrate phosphate dextrose (CPD) with a hematocrit of 0.50-0.60. The component should be 5 days old or less, CMV-negative, HEV-negative and irradiated. The irradiated red cells should be transfused within 24 hours of irradiation. A blood warmer should be used as red cells should not be transfused straight from 4°C storage in this situation.

Exchange transfusion must be performed according to the Simpsons Centre for Reproductive Health (SCRH) “Exchange transfusion” guidelines accessed on the NHS Lothian intranet at Healthcare A-Z > Reproductive Medicine > Neonatal Unit > SMMP Intranet Site Link > Clinical Guidelines > Haematology.

Blood for exchange transfusion should **always** be irradiated if the patient has already had intrauterine transfusion.

Irradiated blood should also be used in other neonates who are receiving an exchange transfusion unless delay in obtaining irradiated blood would cause clinically significant delay (refer to special requirements, Appendix C).

**MONITORING THE TRANSFUSED INFANT**

Monitoring of infants during transfusion is similar to adult practice. The baseline and early checks must be undertaken. Restlessness, crying, or unexpected lethargy may be signs of an early transfusion reaction. If in doubt, the transfusion must be stopped and the patient assessed.

Neonates rarely develop simple, non-haemolytic, febrile, transfusion reactions. Their temperature may rise or fall in response to a septic event and this type of reaction should be regarded as possibly septic in nature. The transfusion should be stopped and the IV access kept open until the patient can be fully assessed.
APPENDIX C: SPECIAL REQUIREMENTS

It is the responsibility of the practitioner requesting blood components to check the patient’s transfusion history and to ensure any special requirements are communicated to the transfusion laboratory on the request form. Please see details below for any exceptions to this requirement.

Irradiated Components

For at-risk patients, all red cell, platelet and granulocyte concentrates should be irradiated. It is not necessary to irradiate FFP, cryoprecipitate or fractionated plasma products.

[In the haematology department (adults) ONLY, irradiated blood component requirements are communicated to the transfusion laboratory via a specific Special Requirement Request Form – not on the standard transfusion request form].

Indications for irradiated components are:

- All intrauterine transfusions.
- All exchange or top-up transfusions in infants where there has been a previous intra-uterine transfusion, until 6 months after the expected delivery date.
- Exchange transfusion, with no previous intra-uterine transfusion; irradiated blood is recommended provided this does not unduly delay transfusion
- Proven or suspected congenital immunodeficiency states (including Severe Combined Immunodeficiency (SCID), Di George’s syndrome, Wiskott-Aldrich syndrome, purine nucleoside phosphorylase deficiency, reticular dysgenesis, cell-mediated immunodeficiency (not otherwise classified), primary T lymphocyte immunodeficiencies, adenosine deaminase deficiency, MHC Class I and II deficiency, leucocyte adhesion deficiency, immunodeficiency with eosinophilia, ataxia telangiectasia, chronic mucocutaneous candidiasis).
- All autologous bone marrow or peripheral blood stem cell transplant recipients from start of conditioning until at least three months after transplant (or until at least six months after transplant if total body irradiation has been given).
- All allogeneic bone marrow or peripheral blood stem cell transplant recipients from start of conditioning until a minimum of six months after transplant; possibly longer at the discretion of the haematologist e.g. chronic GvHD.
- Blood transfused to allogeneic bone marrow or peripheral blood stem-cell donors for 7 days before the harvest and until after the last collection.
- Blood transfused to patients undergoing autologous bone marrow harvest for the 7 days before the harvest and until after the harvest.
- Blood transfused to patients undergoing autologous peripheral blood stem-cell mobilisation from commencement of the mobilising chemotherapy regimen and until the last collection.
- Patients with Hodgkin’s disease, indefinitely.
- Patients treated with the purine analogue drugs Fludarabine, Deoxycoformycin, Cladribine, Clofarabine and Bendamustine, indefinitely.
• All transfusions from first- or second-degree relatives, even if the patient is immunocompetent.
• All HLA-matched platelet transfusions, even if the patient is immunocompetent.
• All granulocyte transfusions, which must then be transfused with minimum delay.
• Patients receiving ALG, ATG, CAMPATH or any other T-cell depleting agents (such as alemtuzumab for non-haematological indications including solid organ transplantation, multiple sclerosis and vasculitis) during treatment and then indefinitely.

**Hepatitis E Virus (HEV) Negative Components**

For at-risk patients, all red cell, platelet, FFP, cryoprecipitate and granulocyte concentrates should be HEV negative.

Indications for HEV negative components are:

**Solid Organ Transplantation (SOT)**
• SOT recipients taking immunosuppressive medication
• Potential SOT recipients from three months prior to date of planned elective live donor SOT or from date of listing on the deceased donor waiting list for SOT

[In the transplant departments (adults) ONLY, HEV negative blood component requirements for new transplant patients are communicated to the transfusion laboratory via a specific Special Requirement Request Form].

**Allogeneic Haematopoietic Stem Cell Transplantation (HSCT)**
• Potential allogeneic HSCT recipients from three months prior to date of planned HSCT until 6 months after, or for as long as the patient is immunosuppressed
• From the time of diagnosis, patients with diseases such as acute leukaemia, high grade myelodysplastic syndrome and aplastic anaemia requiring ATG who have a high transfusion burden and a significant likelihood of proceeding to allogeneic HSCT
• Post transplant lymphoproliferative disorder
[In the haematology department (adults) ONLY, HEV negative blood component requirements are communicated to the transfusion laboratory via a specific Special Requirement Request Form - not on the standard transfusion request form].

**Neonates and infants**
• All blood components for neonates and infants up to 12 months of age (paedipaks will routinely be HEV negative)

**Cytomegalovirus (CMV) Negative Components**
• Pregnant women antenatally (pre-delivery only). If CMV negative components are not readily available and a delay will compromise the mother or baby, CMV random components (i.e. untested) are an acceptable alternative.
• Intra-uterine transfusion irrespective of the CMV status of the mother.
• All blood transfusions for infants up to 28 days post expected delivery date (paedipaks will routinely be CMV negative)
APPENDIX D

BLOOD TRANSFUSIONS IN NHS LOTHIAN COMMUNITY HOSPITAL SETTINGS

Blood components are transfused in some of the community hospitals in NHS Lothian. The policy outlined in the main document also applies to transfusions taking place in these settings. However, some procedures may vary due to the facilities available in community settings. The aspects of transfusion practice which may be different are detailed below.

All staff involved in the transfusion process must have documented evidence of having appropriate and current (at least within last two years) Module One Safe Transfusion Practice training for their role.

In the event of a major haemorrhage occurring on any non-acute NHS Lothian site, the patient should be transferred as an emergency to an Emergency Department.

The following table outlines where procedures may vary from the acute hospitals. Unless otherwise stated, the procedures in the main document must be followed. The table indicates which section of the main document should be referred to.

<table>
<thead>
<tr>
<th>Section</th>
<th>Page Reference</th>
<th>Procedure Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3-5</td>
<td>All blood components for transfusion in community hospitals are supplied by the SEBTS transfusion laboratory at Edinburgh Royal Infirmary. This laboratory must be contacted for information and advice (ext 27501/2).</td>
</tr>
<tr>
<td>Blood Components and Associated Storage</td>
<td>6-10</td>
<td>Red cells for transfusion in community hospitals are delivered directly to the clinical area in validated transit boxes. Once a transit box has been opened, transfusion must be completed within 4 hours. If blood is no longer required the transfusion laboratory must be contacted to arrange return of the unused component/s. Blood components must never be stored in any domestic or drug fridge.</td>
</tr>
<tr>
<td>Requirements</td>
<td></td>
<td>As main policy</td>
</tr>
</tbody>
</table>

52
<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Transfusion Blood Sampling and Completion of Request Form</td>
<td>16-20</td>
<td>All pre-transfusion samples for patients in community hospitals must be sent to the SEBTS transfusion laboratory at Edinburgh Royal Infirmary.</td>
</tr>
</tbody>
</table>
| Requesting Blood Components                  | 21-23 | When blood is requested from the transfusion laboratory by telephone, the staff member making the request must provide the patient’s forename, surname, date of birth, CHI number and gender and ask that the details are repeated back to ensure safe patient identification.  

When requesting blood components, consideration must be given to allow for transit of samples and components between the clinical area and the transfusion laboratory.  

**In the event of a major haemorrhage occurring on any of the non-acute NHS Lothian sites, the patient should be transferred as an emergency to an Emergency Department.** |
| Collecting Blood Components                  | 24-29 | Red cells for transfusion in community hospitals are delivered directly to the clinical area in validated transit boxes. Once a transit box has been opened, transfusion must be completed within 4 hours. If blood is no longer required the transfusion laboratory must be contacted to arrange return of the unused component/s.  

The staff member who receives the delivery from the driver must check that the correct blood component has been delivered for the correct patient. |
| Practical Aspects of Transfusion             | 30-31 | As main policy                                                                                                                                                                                                 |
| Component Administration | 32-34 | Blood and blood components should only be administered by a registered practitioner as listed:

- A Registered Medical Practitioner (this also includes provisionally registered FY1s)
- A Registered Nurse of band 5 or higher
- A Registered Midwife
- A Registered Sick Children’s Nurse
- A Registered Operating Departmental Practitioner

NHS Lothian policy stipulates that each pack must be checked by **two** members of staff, one of which must be registered (see above).

The other checker may be a registered member of staff or a student nurse, student ODP or student midwife, if the student has:

- received face-to-face instruction on safe blood transfusion at University,
- completed Module One Safe Transfusion Practice e-learning and
- been assessed as competent to do so by their clinical mentor.

If there is only one registered member of staff in the community setting, a clinical support worker may also be the other checker if they have received face-to-face instruction on safe blood transfusion, completed Module One Safe Transfusion Practice e-learning and been assessed as competent to do so by their line manager. They must always perform this check along with a registered member of staff. |
| Patient Monitoring and Follow Up | 35-37 | As main policy |
| Adverse Reactions (including reporting) | 38-43 | As main policy |
BIBLIOGRAPHY, REFERENCES AND FURTHER READING


  The www.transfusionguidelines.org.uk site is an excellent resource regarding all aspects of transfusion – including guidance materials on consent for transfusion: from homepage go to Transfusion Practice > Consent for Blood Transfusion

- **British Committee for Standards in Haematology (BCSH) guidelines** accessed at www.bcsghguidelines.com:
  - The administration of blood components (2009)
  - Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories (2012)
  - Guidelines for the use of anti-D immunoglobulin for the prevention of haemolytic disease of the fetus and newborn (2014)
  - Guidelines for blood grouping and antibody testing in pregnancy (2016)
  - Guidelines on transfusion for foetuses, neonates and older children (2016)

- **Scottish Executive NHSHDL(2003)19**


- **Serious Hazards of Transfusion (SHOT) annual reports** accessed at www.shot-uk.org (latest 2015)

- “Right blood, right patient, right time” RCN (2004, revised 2013) accessed at www.rcn.org.uk

- [www.learnbloodtransfusion.org.uk](http://www.learnbloodtransfusion.org.uk) - SNBTS online transfusion training programme (also accessed via NHS Learnpro on the NHS Lothian intranet and via medical education website at [www.med.scot.nhs.uk](http://www.med.scot.nhs.uk))

- **National Patient Safety Agency (NPSA) Safer Practice Notice 14 Right patient, right blood** accessed at [www.nrls.npsa.nhs.uk](http://www.nrls.npsa.nhs.uk)

Many other publications are held in the Department of Transfusion Medicine based at the Royal Infirmary. If you have a specific query you should direct this to the Consultant in Transfusion Medicine.

Other policies of interest that link with this document are available on the NHS Lothian intranet > Healthcare >

- clinical guidance > **Consent Policy** and **Guidance for Obtaining Consent**
- clinical guidance > **Patient Identification Policy**
- A-Z > Blood Transfusion > Policies & Procedures > **Major Haemorrhage Protocol** (for Royal Infirmary of Edinburgh, Western General Hospital and St John’s Hospital)
Additional NHS Lothian transfusion information can also be found on the Blood Transfusion page of the NHS Lothian intranet (Healthcare > A-Z > Blood Transfusion) – please go to:

http://intranet.lothian.scot.nhs.uk/NHSLothian/Healthcare/A-Z/Laboratories/BloodTrans/Pages/BloodTransfusion.aspx