Guideline for Management of Major Haemorrhage

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<th>Directorate</th>
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<td>Hospital Transfusion Committee</td>
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<td>Target Audience</td>
<td>All clinical staff involved in caring for patients with major haemorrhage</td>
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## DOCUMENT VERSION CONTROL SCHEDULE

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Key Points

- This document aims to give guidance about transfusion management of a patient who has major haemorrhage and is likely to need rapid infusion of substantial volumes of fluid, together with red cell and other blood component replacement.

- This document outlines the procedure to follow to ensure prompt laboratory response and issue of blood and blood components.
### Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
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<td>16</td>
<td>12</td>
</tr>
<tr>
<td>17</td>
<td>12</td>
</tr>
<tr>
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</tr>
<tr>
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<td>13</td>
</tr>
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Guideline for Management of Major Haemorrhage

1. Introduction

1.1 Major haemorrhage jeopardises the survival of patients in many clinical settings.

1.2 In major haemorrhage situations, a successful outcome requires prompt action and good communication between the various clinical specialities, diagnostic laboratories, and blood bank staff.

1.3 The British Committee for Standards in Haematology (BCSH 2015) has published practical guidelines on the management of major haemorrhage and it is on these guidelines this document is based.

2. Purpose

2.1 This document aims to give guidance about transfusion management of a patient who has a major haemorrhage and is likely to need rapid infusion of blood components.

2.2 For a detailed description of the procedure for requesting and administering blood components, refer to the Trust Blood Transfusion Policy document, available on SharePoint.

3. Scope

As patients with major haemorrhage may present in a variety of clinical settings, from a range of specialities, this guidance applies to any clinician treating a patient with major haemorrhage.

4. Definitions

4.1 Major haemorrhage in adults can be defined as ≥40% loss of total blood volume (the normal adult blood volume is approximately 7% of ideal body weight) or 4 litres in 24 hours, or 2 litres in 3 hours or a haemorrhage of >150ml/minute. However, these definitions may be difficult to apply in the acute situation. The British Committee for Standards in Haematology (BCSH 2015) therefore suggests that major haemorrhage is bleeding which leads to a heart rate more than 110 beats/min and/or systolic blood pressure less than 90 mmHg.

4.2 Major haemorrhage in children can be defined as a haemorrhage of >80ml/kg in 24 hours or >40ml/kg in 3 hours or >3ml/kg/minute. In clinical practice haemodynamic changes compatible with hypovolaemia, accompanying evidence or suspicion of serious haemorrhage are the usual triggers. There is little evidence available to guide paediatric care, however the principles of management of massive blood loss in adults should be broadly applied to the care of children (BCSH, 2016).
5. **Priorities for treatment**

5.1 Early recognition of significant haemorrhage, ideally before major increments in pulse rate and falls in blood pressure, allowing prompt action to pre-empt shock.

5.2 Restoration of circulating volume to maintain tissue perfusion and oxygen delivery.

5.3 Achieving haemostasis through surgical or other interventional procedures if indicated.

5.4 Achieving haemostasis by correction of coagulopathy with blood component therapy if indicated.

5.5 Whenever possible, blood transfusion and blood component therapy should be guided by laboratory investigations interpreted with advice from a Haematologist.

5.6 **Early involvement of senior staff is essential – CALL FOR ASSISTANCE IMMEDIATELY.**

6. **Use of Tranexamic acid**

6.1 Tranexamic acid is an anti fibrinolytic agent and inhibits the activation of plasminogen to plasmin.

6.2 Trial data (CRASH-2) showed that the administration of Tranexamic acid to adult trauma patients with, or at risk of, significant haemorrhage significantly reduces all-cause mortality with no apparent increase in vascular occlusive events (CRASH 2 2010).

6.3 Adult trauma patients with, or at risk of, major haemorrhage, in whom antifibrinolytics are not contraindicated, should be given Tranexamic acid as soon as possible after injury, at a dose of 1g intravenously over 10 min followed by a maintenance infusion of 1g over 8 hours (BCSH 2015). It is recommended that Tranexamic acid is used within 3 hours of injury.

6.4 The use of Tranexamic acid should be considered in non-traumatic major bleeding (BCSH 2015).

6.5 Patients with isolated head injury should not routinely receive Tranexamic acid as risk of thrombosis exists.

6.6 Initial use of Tranexamic acid should be avoided when time from injury is known or suspected to be greater than 3 hours.

6.7 For more information on dose and administration, please refer to Appendix 1 (NHS East of England Trauma Network TEMPO guidelines 2012).
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7. Major Haemorrhage at Stamford Hospital

7.1 There are 2 units of O RhD Negative blood at Stamford Blood Bank which is available at all times to support the patient’s immediate needs.

7.2 In case of major haemorrhage, arrangements should be made to transfer the patient to PCH by emergency ambulance.

7.3 Transfusion at PCH should also be contacted on 8451/2 or bleep 1151 out of hours to inform them that:
- The patient is being transferred to PCH (they may need further transfusion support on arrival).
- The emergency O RhD negative blood has been used (so that replacements can be issued).

8. Activation of major haemorrhage protocol – general (see section 9 for obstetrics)

8.1 Blood transfusion laboratory staff must be informed of major haemorrhage at the earliest opportunity so that emergency procedures can be activated in a timely manner.

8.2 The decision to activate the major haemorrhage protocol must be made by senior member of the medical staff (Registrar or above).

8.3 The person activating the major haemorrhage protocol must nominate a communication lead who will then contact the transfusion laboratory on ext 8451 or bleep 1151 out of hours using the phrase “Initiate the major haemorrhage protocol for (state location)”

Please note: - If there is no response from these numbers, then they should ring 2222 and ask for bleep 1151 as an emergency.

8.4 The transfusion laboratory must be given the following information:-
- The patient’s full name and date of birth (if known) and hospital number.
- For children, the weight of the child.
- Details of the incident (for instance whether emergency group O red cells are required/already used or whether group-specific blood is required).
- Which major haemorrhage pack(s) are required (a request on ICE must also be made).
- The name and contact number of the communication lead. To avoid the potential for miscommunication and repeated calls to the laboratory with varying messages, all contact with the laboratory should be through this person.

8.5 The communication lead must ensure that blood samples for full blood count, cross match and clotting screen are sent. These samples must be labelled with the following information (as a minimum):
- Patient’s first name and surname (if known).
- Patient’s Date of birth (if known).
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- Hospital Number from ID band. **Any samples which do not meet this minimum requirement will be rejected.**

8.6 The samples should be sent directly to transfusion via the air tube to station number 400. If for any reason the air tube system is not available, they should be hand delivered to transfusion.

8.7 A designated member of staff should be identified to act as a ‘runner’ to collect the components from the transfusion laboratory. This will usually be a member of the clinical team. or in some circumstances, the emergency blood porter (see 8.8 below). If the porter is needed to transport blood they can be contacted on bleep 1817 (see Appendix 6). The porter must be informed that the major haemorrhage protocol is in progress, and that this must be given absolute priority over other tasks. They must remain available for the duration of the incident.

8.8 Porters MAY NOT deliver individual units directly to specific patients or clinical areas. However, porters MAY:
- Transport blood/blood components to the Theatre or Maternity blood fridges.
- In an emergency situation, collect blood packed by prior arrangement with the transfusion laboratory into a blood transport box.
- In absolute dire emergencies, collect emergency O negative blood.

8.9 Transfusion will contact the communication lead to inform them when the blood components are ready for collection. As soon as the blood/components are collected, the laboratory staff will inform the communication lead that they are transit.

9. **Activation of major haemorrhage protocol – Obstetrics**

9.1 Blood transfusion laboratory staff must be informed of major Obstetric haemorrhage at the earliest opportunity so that emergency procedures can be activated in a timely manner.

9.2 The decision to activate the major haemorrhage protocol must be made by senior member of the medical staff (Registar or above).

9.3 The person activating the major haemorrhage protocol must nominate a communication lead who will then **contact switchboard on 2222 and state “Activate the major obstetric haemorrhage protocol”**. They must also give switchboard their name and a contact telephone number.

9.4 Switchboard will then ‘fast bleep’ Transfusion on 1151 with the message “**Major Obstetric haemorrhage, contact XXXX (phone number)”**.

9.5 When they return the call, the transfusion laboratory staff must be given the following information:
**CAUTION:** Refer to the Document Library for the most recent version of this document

- The patient’s full name and date of birth (if known) and hospital number.
- Details of the incident (for instance whether emergency group O red cells are required/already used or whether group-specific blood is required).
- Which major haemorrhage pack(s) are required (a request on ICE must also be made).
- The name and contact number of the communication lead. To avoid the potential for miscommunication and repeated calls to the laboratory with varying messages, all contact with the laboratory should be through this person.

9.6 The communication lead must ensure that blood samples for full blood count, cross match and clotting screen are sent. These samples must be labelled with the following information (as a minimum).
- Patient’s first name and surname (if known).
- Patient’s Date of birth (if known).
- Hospital Number from ID band.

Any samples which do not meet this minimum requirement will be rejected.

9.7 The samples should be sent directly to transfusion via the air tube to station number 400. If for any reason the air tube system is not available, they should be hand delivered to transfusion.

9.8 Once the components are being prepared for collection, transfusion will contact switchboard via 2222 and ask for the emergency blood porter to be bleeped on 1817. The message appearing on the bleep will be **“massive blood loss – go to transfusion”**. The porter will then come to the transfusion department for further instructions as a priority. They must remain available for the duration of the incident.

10. **Issue of major haemorrhage packs – adults**

10.1 On activation of the major haemorrhage protocol the transfusion laboratory staff will issue on receipt of an ICE request major haemorrhage packs in the following order:

- **Initial major haemorrhage pack** – 4 units red blood cells.
- **Primary major haemorrhage pack** – 5 units red blood cells, 4 units FFP.
- **Secondary major haemorrhage pack** – 5 units red blood cells, 4 units FFP, 1 unit platelets, 2 pools cryoprecipitate.

**Please note** – these packs must be requested on ICE and the request form sent to the laboratory, they cannot be issued until a request form is received.

10.2 Depending on the clinical situation, the decision may be taken to request the initial/ primary/ secondary pack at the same time. Please inform transfusion if this is thought necessary, and make the appropriate ICE requests.

10.3 When the initial major haemorrhage pack has been issued, the transfusion laboratory will contact the NHSBT Cambridge blood transfusion centre and
request 2 bags of platelets as an emergency delivery (in practice there may already be platelets available on the premises).

10.4 The transfusion laboratory will inform a Consultant Haematologist that the major haemorrhage protocol has been activated.

11. Issue of major haemorrhage packs – children (see Appendix 4)

11.1 On activation of the major haemorrhage protocol for children the transfusion laboratory staff will issue on receipt of an ICE request major haemorrhage packs in the following order:

- **Initial major haemorrhage pack** – 20ml/kg red blood cells (up to 4 units).
- **Primary major haemorrhage pack** – 30ml/kg red blood cells (up to 5 units), 20ml/kg FFP (up to 4 units).
- **Secondary major haemorrhage pack** – 30ml/kg red blood cells (up to 5 units), 20ml/kg FFP (up to 4 units), platelets 15ml/kg (up to 1 unit)
  
  Cryoprecipitate 5ml/kg (up to 300ml).

**Please note** – these packs must be requested on ICE and the request form sent to the laboratory, they cannot be issued until a request form is received.

11.2 Depending on the clinical situation, the decision may be taken to request the initial/primary/secondary pack at the same time. Please inform transfusion if this is thought necessary, and make the appropriate ICE requests.

11.3 When the initial major haemorrhage pack has been issued, the transfusion laboratory will contact the NHSBT Cambridge blood transfusion centre and request platelets as an emergency delivery (in practice there may already be platelets available on the premises).

11.4 The transfusion laboratory will inform a Consultant Haematologist that the major haemorrhage protocol has been activated.

12. Location of blood products

12.1 Emergency O RhD Negative red cell unit units are available at all times at the following locations:

- 2 units in the main blood bank, 4th floor core B.
- 4 units in the maternity blood bank.
- 2 units of neonatal O RhD neg are in the maternity blood bank.
- 2 units at Stamford Hospital.

**Please note there are no emergency ORhD Negative units in theatre blood bank.**

12.2 Anyone taking the emergency O RhD Negative units must inform transfusion immediately.
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12.3 Refrigerated products (red cells and FFP) issued during the major haemorrhage protocol activation for maternity patients must always be placed in the maternity blood bank location 1 OBD.045, even if the patient is in theatre.

12.4 Refrigerated products (red cells and FFP) for patients in theatre should be placed in the theatre blood fridge location 1.THE.113.

12.5 For other clinical areas including ED, blood will be issued in a 2 hour transport box.

12.6 All non refrigerated components (i.e: platelets and cryoprecipitate) should be handed over to an appropriate member of staff, never put them into the fridge. Please note: if the emergency blood porter is despatched to collect non refrigerated products, the communication lead must ensure that someone is available to receive these products from the porter, in order that transfusion is not delayed. The person receiving them should sign, date and time the FRONT of the pink and yellow compatibility form as a record of receipt.

12.7 The transfusion laboratory will keep a record of the times products were requested, issued and used (see Appendix 7).

12.8 All units must be signed for as used, and traceability tags completed, to comply with the Blood Safety and Quality Regulations 2005.

13. Conclusion of the incident

13.1 At the conclusion of the incident, a senior member of the medical staff (registrar or above) must notify the transfusion laboratory that they may stand down.

13.2 A monthly review of incidents will be prepared by the Transfusion Operational Management Team and included as an agenda item for the Hospital Transfusion committee. This will include any action points that arise from the incidents. Any adverse events will be identified and reported via DATIX, and corrective and preventative actions recorded on the laboratory Q pulse system.

14. Endorsement

The guideline will be approved by the Hospital Transfusion Committee & endorsed by the Quality Governance Operational Committee.

15. Distribution

The guideline will be recorded on SharePoint.
16. References


17. Associated documents

Blood Transfusion Policy (C0160).
Appendix 1
Information for use of Tranexamic acid (Ref: NHS East of England Trauma Network TEMPO Guidelines 2012, section 11a)

Tranexamic acid (TXA)

**Drug notes**
Inhibits fibrinolysis, therefore can be used to reduce bleeding

**Use**

**Indications**
- Suspected bleeding in the context of major trauma (excluding isolated head injury) where the patient has either a heart rate >110 or systolic BP <90

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<th>Dose 2 – during 8hrs following incident</th>
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<td>known allergy to Tranexamic acid</td>
<td>Adults: 1g IV/IO over 10 mins</td>
<td>1g IV at 60ml/hr over 8hrs</td>
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<td>Children: 10mg/kg IV/IO over 10 mins (max 1g)</td>
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**Special groups**
- No evidence of harm in pregnancy

**Side effects**
- Nausea, vomiting
- Hypotension on rapid injection

**Presentation**
500mg in 5ml, glass vial (100mg/ml)

**Administration – dose 1**
Required volume (dose) into 100ml 5% dextrose (in trauma bag) or 100ml NSaline. Administer IV/IO over 5–10 mins

**Administration – dose 2**
1g tranexamic acid in 500ml of NSaline over 8hrs at rate of 60ml/hr.

**Drug information**
Not a controlled drug
Can be kept at room temperature
Appendix 2
Procedure for activating and requesting blood in major haemorrhage situations

**MAJOR HAEMORRHAGE PROTOCOL ACTIVATION**

- The communication lead should call transfusion on 📞 8451/2 (Bleep 1151 out of hours)  
  (If no reply from these numbers ring switchboard 2222 and ask for bleep 1151)
- State ‘Activate the Major Haemorrhage Protocol’  
  Give your **name, location** and **phone number** you can be contacted on
- Tell transfusion  
  o The patients Name, DoB and Hospital number (if known)  
  o For children, the weight of the child  
  o Details of the incident (for instance whether emergency group O RhD neg red cells are required /already used or whether group-specific blood is required)  
  o which major haemorrhage pack(s) you require (these will be adjusted for children depending on the age/ weight of the child)

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<td>Primary pack</td>
<td>= 5 units Red cells, 4 bags FFP</td>
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<tr>
<td>Secondary pack</td>
<td>= 5 units Red cells, 4 bags FFP, 2 pools</td>
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</table>
  Cryoprecipitate, 1 bag of platelets

*(Please remember an ICE request must also be made and sent to transfusion)*

**2 UNITS OF EMERGENCY O RH+ NEGATIVE BLOOD ARE AVAILABLE AT ALL TIMES IN THE BLOOD BANK - TELL TRANSFUSION IMMEDIATELY IF USED**

- Identify a member of staff to be the ‘runner’ and ask them to collect the components from the transfusion laboratory. If the patient is in theatre, the red cells & FFP should be taken to theatre blood bank. For other clinical areas including ED, blood will be issued in a 2 hour transport box  
- Cryoprecipitate & Platelets must not be refrigerated, but handed to a member of staff – so make sure someone is available to receive them

**Don’t forget:**
- Nominate one person to keep transfusion updated of the situation, and relay requests further components as necessary  
- Tell transfusion to ‘stand down’ once the incident is resolved

**Transfusion 📞 8451/2 or Bleep 1151 out of hours**
Appendix 3
Procedure for activating and requesting blood in major obstetric haemorrhage

MASSIVE OBSTETRIC HAEMORRHAGE

- The communication lead should call switchboard on 2222
- State ‘Activate the Massive Obstetric Blood Loss Protocol’
  Give your name, location and phone number you can be contacted on
- Make sure someone stands by this phone to take the call back from transfusion
- When they call back, tell transfusion
  - The patients Name, DoB and Hospital number
  - Details of the incident (for instance whether emergency group O RhD neg red cells are required /already used or whether group-specific blood is required)
  - Which major haemorrhage pack(s) you require

Initial Pack = 4 units Red cells only
Primary pack = 5 units Red cells, 4 bags FFP
Secondary pack = 5 units Red cells, 4 bags FFP, 2 pools Cryoprecipitate, 1 bag of platelets

(Please remember an ICE request must also be made and sent to transfusion)

4 UNITS OF EMERGENCY O RhD NEGATIVE BLOOD ARE AVAILABLE AT ALL TIMES IN THE MATERNITY BLOOD BANK - TELL TRANSFUSION IMMEDIATELY IF USED

- When the blood is ready, transfusion will organise an emergency porter to deliver the units to the maternity blood bank. Transfusion will also inform you that the blood is on its way.

Don’t forget:-
- Non refrigerated components (Cryoprecipitate & Platelets) must be handed to a member of staff – so make sure someone is available to receive them
- Nominate one person to keep transfusion updated of the situation, and relay requests further components as necessary
- Tell transfusion to ‘stand down’ once the incident is resolved

Transfusion ☎️ 8451/2 or Bleep 1151 out of hours
Appendix 4
Flowchart for management of major haemorrhage in adults

Major haemorrhage in adults
≥ 40% loss of total blood volume
4 litres in 24 hours 2 litres in 3 hours > 150ml/min

Get senior help
- Contact senior member of clinical team
- Contact senior ward nurses
- Contact portering services
- Contact Transfusion

Assess ABC
- Check patient identification
- 2 large cannula
- Send blood samples, cross-match, BBC, coagulation, biochemistry
- Consider arterial blood gas measurement

IV access
- IV warm fluids – crystalloid or colloid
- Give oxygen

Resuscitate
- Blood loss >40% blood volume is immediately life-threatening
- Give 4 units via fluid warmer. Aim for Hb>80g/l
- Give Group O if immediate need and/or blood group unknown

Give blood

Prevent coagulopathy
- Anticipate need for platelets and FFP after 4 units blood replacement and continuing bleeding
- Give Primary Major Haemorrhage (M-H) Pack
- Order Secondary Major Haemorrhage (M-H) Pack
- Correct hypothermia
- Correct hypocalcaemia (keep ionised Ca >1.3mmol/L)
- Send FBC and coagulation samples after every 3–5 units of blood given
- Give tranexamic acid for trauma patients and consider its use in non-traumatic bleeding
- Contact Haematologist

Get help to stop bleeding
- Alternate RBC and FFP
- Primary MH pack
  - RBC 5 units
  - FFP 4 units
  - For trauma:
    - 1 pool of platelets
    - RBC:FFP ratio 1:1

Secondary MH pack
  - RBC 5 units
  - FFP 4 units
  - Platelets
  - Cryoprecipitate

If bleeding continues
- Repeat secondary pack

Reassess and document
Appendix 5
Flowchart for management of major haemorrhage in children
Massive blood loss (C-MBL) packs for children

**Red cells**
- Use O RhD negative until group is known – then use ABO and RhD suitable
- Move to crossmatch compatible as soon as all investigations are complete
- Consider age of patient to inform component specification (eg. paediatric red cells)

**Platelets**
- Use group A High Titre Negative (HTN) until group is known – then use ABO suitable (A HTN for AB patients)
- Use apheresis if possible

**Fresh frozen plasma**
- Use group A8 until group is known – then use ABO suitable
  
  **Order of preference:**
  1. Non-UK methylene blue treated (MB-FFP)
  2. Octaplas (SD-FFP)
  3. Standard FFP

**Cryoprecipitate**
- Use group A until group is known – then use ABO suitable (A for AB patients)
  
  **Order of preference:**
  1. Non-UK methylene blue treated cryoprecipitate
  2. Standard cryoprecipitate

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**For platelets, FFP and cryoprecipitate**
Avoid Group O for non-O patients where possible

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<td><strong>Primary pack</strong></td>
<td>2 x Red cells</td>
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<td>2 x FFP (~400ml)</td>
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<td><strong>Secondary pack</strong></td>
<td>2 x Red cells</td>
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<tr>
<td></td>
<td>2 x FFP (~400ml)</td>
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<td>1 x Adult platelet dose</td>
<td>1 x Adult platelet dose</td>
<td>1 x Adult platelet dose</td>
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<tr>
<td></td>
<td>3 x MB Cryoprecipitate (~50ml) or 1 adult pool</td>
<td>10 x MB Cryoprecipitate (~160ml) or 2 adult pools</td>
<td>10 x MB Cryoprecipitate (~160ml) or 2 adult pools</td>
</tr>
</tbody>
</table>
Appendix 6

Information for contacting the emergency blood porter if needed in the event of the major haemorrhage protocol being activated

1. Bleep 1817

2. Give your name, location and contact number

3. State that the major haemorrhage protocol has been activated, and this is an emergency situation.

4. Ask the porter to either:
   - Collect blood for transfusion for patient (give patient’s full name, date of birth and hospital number) from the transfusion laboratory or the main blood fridge and take it to:
     - Theatre blood fridge (Room number 1.THE.113)
     - Maternity blood fridge (Room number 1.OBD.045) (maternity only)
   Or
   - Collect blood for transfusion which has been pre-packed into a blood transport box.

   Please note:- arrangements must be made with the transfusion laboratory staff to pack the blood into a transport box prior to the porter being dispatched to collect it

   The porter must remain available for further transport of blood until the instruction to stand down is received.
Appendix 7
Laboratory form for monitoring major haemorrhage protocol

<table>
<thead>
<tr>
<th>MAJOR HAEMORRHAGE PROTOCOL</th>
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</thead>
<tbody>
<tr>
<td><strong>PATIENT DETAILS</strong></td>
</tr>
<tr>
<td><strong>FORENAME</strong></td>
</tr>
<tr>
<td><strong>TIME TRIGGERED</strong></td>
</tr>
<tr>
<td><strong>DATE TRIGGERED</strong></td>
</tr>
<tr>
<td><strong>PATIENT LOCATION 1</strong></td>
</tr>
<tr>
<td><strong>EMERGENCY O NEG</strong></td>
</tr>
<tr>
<td><strong>IMMEDIATE ISSUE</strong></td>
</tr>
<tr>
<td><strong>CLINICAL CONTACT 2</strong></td>
</tr>
<tr>
<td><strong>CLINICAL CONTACT 3</strong></td>
</tr>
<tr>
<td><strong>DESIGNATED PORTER BLEEP NUMBER</strong></td>
</tr>
<tr>
<td><strong>PRODUCT REQUESTED</strong></td>
</tr>
<tr>
<td><strong>TYPE OF PRODUCT 1</strong></td>
</tr>
<tr>
<td><strong>TYPE OF PRODUCT 2</strong></td>
</tr>
<tr>
<td><strong>TYPE OF PRODUCT 3</strong></td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>TYPE OF PRODUCT 5</strong></td>
</tr>
<tr>
<td><strong>TYPE OF PRODUCT 6</strong></td>
</tr>
<tr>
<td><strong>Test</strong></td>
</tr>
<tr>
<td><strong>Hb</strong></td>
</tr>
<tr>
<td><strong>INR</strong></td>
</tr>
<tr>
<td><strong>aptt</strong></td>
</tr>
<tr>
<td><strong>Plt</strong></td>
</tr>
<tr>
<td><strong>TRANSFUSION HISTORY</strong></td>
</tr>
<tr>
<td><strong>LAST SAMPLE No</strong></td>
</tr>
<tr>
<td><strong>DATE LAST TRANSFUSED</strong></td>
</tr>
<tr>
<td><strong>OK FOR ELEC ISSUE Y/N</strong></td>
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<tr>
<td><strong>ANTIBODIES PRESENT</strong></td>
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Quality Assurance Checklist - Version Number: 6

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<th>COMMENTS (where necessary)</th>
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If answers to any of the above questions is 'no', then this document is not ready for endorsement, it needs further review.

Compliance Team:
1. Date of Compliance Team approval | 20/05/2016 |
2. Comments to author for any amendments |
3. Name of compliance lead | Jim Walker, Quality Governance & Policies Assistant |

Approval Committee: HTC
If the committee/group is happy to approve this document would the chair please sign below and send the document and the minutes from the approval committee to the author. To aid distribution all documentation should be sent electronically wherever possible.

Name | Dr B Appadu |
Date | 08/06/16 |
Signature |

Endorsing Committee: QGOC
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Name |
Date | 12/09/16 |
Signature |