Major Haemorrhage

Definition
Major haemorrhage is arbitrarily defined as the loss of one blood volume within a 24hr period, the normal adult blood volume being approximately 7% of ideal body weight in adults and 8–9% in children. Alternative definitions that may be more helpful in the acute situation include:

- **Rate of loss of 150 ml/min (2-3 ml/kg/min for children)**
  OR
- **Bleeding which leads to a heart rate more than 110 beats/min and/or systolic blood pressure less than 90 mmHg (Adults).**
- **Bleeding with signs of hypovolaemic shock with no likelihood of control (Paediatrics and Neonates)**

The pathways below are available and are suitable to be printed for use in clinical areas:

- Management of major haemorrhage in adults
- Management of major haemorrhage in paediatrics
- Management of major haemorrhage in neonates
- Rapid blood activation process

For situations of acute upper gastrointestinal bleeding please refer to the [Acute Upper Gastro Intestinal Bleeding Guideline](#); for major obstetric bleeding please refer to the [Antepartum Haemorrhage](#) and [Post Partum Haemorrhage Guidelines](#) for the management of major obstetric haemorrhage.

In the event of a catastrophic haemorrhage where the estimated blood loss will approach or exceed total circulating volume; ‘Pack A’ and ‘Pack B’ may be ordered on
the initial request via 2222 from the blood transfusion laboratory.
‘Pack A’ will be issued first whilst the blood transfusion laboratory prepare ‘Pack B’.
‘Pack B’ will be issued as soon as it is ready.
Please note: frozen products (excluding pre-thawed emergency FFP) will take 30-40 minutes to thaw.

**Tranexamic acid**

In the presence of renal impairment, it is important to be aware the use of tranexamic acid infusions can induce seizures: see the [tranexamic acid guideline](#) for full details.

<table>
<thead>
<tr>
<th>Tranexamic acid administration</th>
<th>Adult</th>
<th>Paediatric (16 years or younger and &lt;50kg)</th>
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</thead>
<tbody>
<tr>
<td><strong>Trauma</strong>&lt;br&gt;(important to give within 3 hours of injury from trauma)</td>
<td>1g IV bolus over 10 minutes&lt;br&gt;Followed by Maintenance infusion of 1g IV over 8 hours</td>
<td>15mg/kg IV bolus over 10 minutes&lt;br&gt;Followed by IV infusion (2mg/kg/hour) for at least 8 hours or until bleeding stops</td>
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<tr>
<td><strong>Non trauma</strong>&lt;br&gt;</td>
<td>1g IV bolus over 10 minutes&lt;br&gt;If ongoing bleeding (eg &gt;1L blood loss)&lt;br&gt;Consider repeat dose of 1g IV bolus OR infusion of 1g IV over 8 hours</td>
<td>15mg/kg IV bolus (maximum 1000mg) over 10 minutes&lt;br&gt;If ongoing bleeding&lt;br&gt;Consider IV infusion of 2mg/kg/hour for at least 8 hours or until bleeding stops</td>
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MANAGEMENT OF MAJOR HAEMORRHAGE IN PEDIATRICS

ACTIVATE IF:
Bleeding with signs of hypovolemic shock with no likelihood of control
OR
Evidence of blood loss of 80ml/kg in 24 hours

REMEMBER!
Single component support for less bleeding is available using 2222 to request Rapid Blood

1 ASSIGN A CLINICAL COORDINATOR AND DIAL 2222

The clinical coordinator should speak to blood transfusion for all further communication: state 'MAJOR HAEMORRHAGE' and EXACT LOCATION (eg. MAJOR HAEMORRHAGE, SNOW FOX AT EVELINA CHILDREN'S HOSPITAL)
STAY ON THE LINE.
Switchboard will a) connect the caller to blood transfusion at your site
b) activate a dedicated porter
c) contact the Paediatric Nurse Practitioner (PNP)
d) contact the Haematology SpR (bleep 0294)

Attempts to STOP THE BLEEDING
- Consider surgery/interventional radiology early on - do not delay
- Continuous observations and monitoring of patient is vital

COMPLETE ABC ASSESSMENT
- Give 15mg/kg Tranexamic Acid IV bolus +/- Infusion (maximum 1000mg) (as per Trust clinical guideline)

Reverse any anticoagulation therapy: discuss with Haem SpR

Clinical coordinator to provide to blood transfusion:
- Patient details
- Age and weight
- Exact location
- Contact number

2 Take samples for EPR Order Set: Major Haemorrhage (G&S, FBC, U&E, LFTs, COAG, FIBRINOGEN)

Please take G&S Samples prior to administering blood products if possible.
- REMEMBER: 2 samples with patient ID independently checked x2
- If flying squad blood has already been used, take G&S from distant site.

ORDER and ADMINISTER:

FP/RBC at least 1:2 ratio in haemorrhage - consider 1:1 in trauma

Red cells according to need
- 20ml/kg or maximum 4 adult units
- FFP
- 20ml/kg
- Platelets
  - IF <15kg: 15-20ml/kg
  - IF >15kg: 1 unit of platelets
- Cryoprecipitate
  - 10ml/kg, maximum 2 pools

AIM FOR:
- Platelets >75 x 10^9/L
- INR <1.5
- APTR <1.5
- Fibrinogen >1.5g/L

Ensure regular communication with haematology SpR (bleep 0294) or haematology consultant (via switchboard)

3 INFORM THE TRANSFUSION LABORATORY ONCE MAJOR HAEMORRHAGE HAS BEEN STOOD DOWN

Return all transfused tags in the Red Box and complete the Red Book

HAEMORRHAGE GUIDANCE

- Repeat FBC, COAG & FIBRINOGEN every 30-60 minutes
- Consider calcium replacement if ionised calcium <1mmol/L on ABC: (giving 0.1ml/kg of 10% calcium chloride)
- If ongoing bleeding: consider tranexamic acid infusion and discuss with senior PICU staff, anaesthetist and surgeon

Use the doses above to guide replacement and/or obtain advice from the haematology SpR

GIVE ADDITIONAL:
- RBC IF Hb <80g/L
- FFP IF INR or APTR >1.5
- Platelets IF Platelet <75 x 10^9/L
- Fibrinogen IF Fibrinogen <1.5 g/L

References
BSH: Guidelines on transfusion for neonates, neonates and older children 2016:
MANAGEMENT OF MAJOR HAEMORRHAGE IN NEONATES

REMEMBER!
Single component support for less bleeding is available using 2222 to request Rapid Blood

ACTIVATE IF:
Bleeding with signs of hypovolaemic shock with no likelihood of control
OR
Evidence of blood loss of 40ml/kg in 24 hours

1 ASSIGN A CLINICAL COORDINATOR AND DIAL 2222

The clinical coordinator should speak to blood transfusion for all further communication: state ‘MAJOR HAEMORRHAGE’ and exact location (eg. MAJOR HAEMORRHAGE, NEONATAL INTENSIVE CARE UNIT at EVELINA CHILDRENS HOSPITAL) – STAY ON THE LINE
Switchboard will a) connect the caller to blood transfusion at your site
b) activate a dedicated porter
c) contact the Site Nurse Practitioner
d) contact the Haematology SpR (bleep 0294)

Attempt to STOP THE BLEEDING
• Consider surgery/interventional radiology early on – do not delay
• Continuous observations and monitoring of patient is vital

COMPLETE ABC ASSESSMENT

Tranexamic acid use should be directed by haematology SpR
Flying squad O RhD neg red cells for neonates from Birth Centre blood fridge can be used in first instance
Reverse any antiocoagulation therapy: discuss with Haem SpR

Clinical coordinator to provide to blood transfusion:
• Patient details
• Age and weight
• Exact location
• Contact number

2 Take samples for EPR Order Set: Major Haemorrhage (G&S, FBC, U&E, LFTs, COAG, FIBRINOGEN)

Please take G&S Samples prior to administering blood products if possible.
• REMEMBER: 2 samples with patient ID independently checked x2
• If flying squad blood has already been used, take G&S from distant site.

3 ORDER and ADMINISTER:

FFPRBC at least 1:2 ratio in haemorrhage – consider 1:1 in trauma)
Red cells (suitable for neonatal use) 20ml/kg
FFP 20ml/kg
Platelets (apheresis) 15-20ml/kg
Cryoprecipitate 10ml/kg

Aim for:
Platelets > 100x10^9/L
INR ≤ 2.0
APTT < 2.0
Fibrinogen > 1.5g/L

Ensure regular communication with haematology SpR (bleep 0294) or haematology consultant (via switchboard)

4 INFORM THE TRANSFUSION LABORATORY ONCE THE MAJOR HAEMORRHAGE HAS BEEN STOOD DOWN

Return all transfused bags in the Red Box and complete the Red Book

HAEMORRHAGE GUIDANCE

• Repeat FBC, COAG & FIBRINOGEN every 30-60 minutes
• Consider calcium replacement if ionised calcium <1 mmol/L on bloods (give emergency calcium replacement as per local guidance)

Use doses above to guide replacement and/or obtain advice from haematology SpR
Seek haematology advice if post bypass platelet inactivation is suspected

References