

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.

Tranexamic acid administration	Adult	Paediatric (16 years or younger and <50kg)
Trauma (important to give within 3 hours of injury from trauma)	1g IV bolus over 10 minutes Followed by Maintenance infusion of 1g IV over 8 hours	15mg/kg IV bolus over 10 minutes Followed by IV infusion (2mg/kg/hour) for at least 8 hours or until bleeding stops
Non trauma	1g IV bolus over 10 minutes If ongoing bleeding (eg >1L blood loss) Consider repeat dose of 1g IV bolus OR infusion of 1g IV over 8 hours	15mg/kg IV bolus (maximum 1000mg) over 10 minutes If ongoing bleeding Consider IV infusion of 2mg/kg/hour for at least 8 hours or until bleeding stops

MANAGEMENT OF MAJOR HAEMORRHAGE IN PAEDIATRICS



ACTIVATE IF:
 Bleeding with signs of hypovolaemic 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 CHILDRENS HOSPITAL) – STAY ON THE LINE

- Switchboard will
- connect the caller to blood transfusion at your site
 - activate a dedicated porter
 - contact the Paediatric Nurse Practitioner (PNP)
 - contact the Haematology SpR (bleep 0294)

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

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

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

Reverse any anticoagulation therapy: discuss with Haem SpR

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:

FFP: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	>75x10 ⁹ /L
INR	<1.5
APTR	<1.5
Fibrinogen	>1.5g/L

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

4 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 ABG: (give 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 <80 g/l
 FFP IF INR or APTR >1.5
 Platelets IF Platelets < 75 x10⁹/l
 Fibrinogen IF Fibrinogen <1.5 g/L

MANAGEMENT OF MAJOR HAEMORRHAGE IN NEONATES



ACTIVATE IF:
 Bleeding with signs of hypovolaemic shock with no likelihood of control
OR
 Evidence of blood loss of 40ml/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, 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 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.

3 ORDER and ADMINISTER:

FFP:RBC 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 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 bloodgas (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
 BCSH. A practical guideline for the haematological management of major haemorrhage. *British Journal of Haematology* 2015; 170:788-803
 BCSH. Guidelines on transfusion for fetuses, neonates and older children 2016.
<http://www.bcsHQguidelines.com/documents/2016-neonates-final.pdf>