UNIVERSITY HOSPITAL HAIRMYRES

Paediatric Major Haemorrhage

Age 1 month - 15 years **Weight < 50 kg**

Clinical Concern of Massive Blood Loss

OR

20% of blood loss in < 1 hour

OR

50% blood volume loss in <3 hours

Less than 1 year infant blood volume: **90ml/kg**

1 year - 15 years child blood volume: **80ml/kg**

Declare **Paediatric Major Haemorrhage**

- **Call 2222**
- **State** "**Paediatric Major Haemorrhage"** and **patient location**, switchboard will repeat back.

- Designate **Resuscitation Team Leader**
- Designate **Paediatric Major Haemorrhage Co-Ordinator**
- Issue Resuscitation Team Leader and Paediatric Major Haemorrhage Co-ordinator **Action Cards**

Simultaneously
(Delegate / Allocate)

- Consider **O-Negative Packed Red Cells: 20 ml / kg**
  Available for immediate release from blood transfusion lab.

- Continue **Packed Red Cells (PRCs)** as required: **20 ml / kg** aliquots
  - **O-Negative PRCs** if ongoing immediate need.
  - Then use **Group Specific PRCs** *(approx. 15 minutes to issue)*
  - Aim for **Fully Cross-Matched PRCs** *(approx. 35 minutes to issue)*

- **Fresh Frozen Plasma** (FFP): **20 ml / kg** *(approx. 30 minutes to issue)*

- **Platelets:** **15 - 20 ml / kg** *(order early - may have to come from another site)*

- **Cryoprecipitate:** **10 ml / kg** *(approx. 30 minutes to issue)*

Consider required **product ratios:** **1:1:1 (Trauma or Obstetric)**
2:1:1 (All other major haemorrhage)

- **Control bleeding**
  Direct compression, splinting, surgical control and/or interventional radiology.

- **Keep patient warm**
  Remove wet / blood-soaked clothes, use air warming blanket, warmed fluids, warmed blood)

- **Obtain Intravenous (IV) access and/or Intraosseous (IO) access.**
  Maximum of 2 attempts at IV before proceeding to IO

- Send **Cross-match, FBC, U&E, Calcium, Coagulation Screen** and perform **Blood Gas** (Venous or Arterial).

- Give **Tranexamic Acid**:
  Loading dose 15 mg / kg (max 1 gram) over 15 minutes.
  Then continuous infusion of 2 mg / kg / hr (max 125 mg / hr) for 8 hours.

- Consider **IV Calcium** if ionised Ca^{2+} < 1.0 mmol/L
  Calcium Gluconate 10%: 0.5 ml / kg (maximum 20ml) over 10 mins

TARGET LABORATORY VALUES

- **Haemoglobin** (Hb): > 80 g/L
- **Platelets** (Plt): > 75 $x10^9$/L
  > 100 $x10^9$/L if Major Trauma / HI
- **Fibrinogen** (Fib): > 1.5 g/L
  > 2 g/L in Major Trauma / HI
- **PT**: < 17 secs (Ratio < 1.5)
- **APTT**: < 41 secs (Ratio < 1.5)

CONTACTS

Blood Bank:	**4311**	(24/7)
Paediatrics:	**UHW**	**24/7 via Switchboard**
Haematologist:	4320	(OOH via Switchboard)
Anaesthesia / ICM:	4578	(24/7)
General Surgery:	4547	(24/7)
Theatre Co-ordinator:	4053	(OOH via Switchboard)

CONSULTANT HAEMATOLOGIST WILL ADVISE:

- **Reversal of Anticoagulation** (Wafarin, Heparin, DOACs)
- **Patients with Bleeding Disorders**
- **Special Requirements** (Irradiated Blood, CMV-Negative)
- Use of Recombinant Factor VIIa

in an emergency, additional information can be found in the full Major Haemorrhage Protocol for Paediatric Patients document.
- available via Right Decisions Service (RDS) website and NHSL Guidelines app -

Cautions / Complications in Massive Transfusion

- **Adverse Transfusion Reaction** - Fever, Itch, Rashes (including Urticaria / Hives), Flushing / Vasodilation are unlikely to be seen as early responses to major trauma. See also Adverse Transfusion Reaction management document - available via FirstPort.
- **Hypothermia** - Resulting from prolonged patient exposure or infusion of cold blood components / fluids / drugs. Monitor temperature frequently, use warming blankets, warm blood and fluids.
- **Hyperkalaemia** - Blood components contain high levels of potassium or can contribute to cell lysis. Monitor potassium regularly, treat according to standard protocols.
- **Hypocalcaemia** - Calcium is consumed as part of the coagulation / haemostatic cascade and is diluted by large volumes of fluids / blood components which do not contain Calcium. Monitor regularly, replace according to standard protocols.

Stand-Down of Paediatric Major Haemorrhage Protocol

•Major Haemorrhage Co-Ordinator informs Blood Bank to stand down. •Return Blue Traceability Labels to Blood Bank. • Return un-used products to blood bank. •Complete all transfusion documentation.