

Paediatric Major Haemorrhage

Quick Reference Guide

DEFINITION OF MAJOR HAEMORRHAGE		CIRCULATING BLOOD VOLUME	
Active haemorrhage PLUS any of: - Bleeding rate >2 ml/kg/min 20 ml/kg red cells in preceding hour 40 ml/kg any fluid in preceding hour - Hypovolaemic shock and/or coagulopathy		Age	Volume
		Term infant	90 ml/kg
		< 3 months	80–90 ml/kg
		> 3 months	70 ml/kg
IMMEDIATE APPROACH			
CALL 2222 — Activate Major Haemorrhage Protocol - A–B–C approach 2× large bore IV access (IO if IV unavailable) - Take baseline samples (see Labs) - Minimise crystalloid — max 10 ml/kg - Give TXA immediately (see dosing) - Damage control: pressure, elevation, dressings, tourniquet - Consider internal / intracerebral haemorrhage in infants - Early surgical involvement + consider cell salvage		Hypothermia >36°C	Fluid warmer, Bair Hugger
		Acidosis BD<6, Lactate<2	1–2 ml/kg sodium bicarbonate
		Coagulopathy	Blood products — see below
		Hypocalcaemia Ca>1 mmol/L	CaGluc 10%: 0.5 ml/kg (max 20 ml) slow IV over 10 min
		Hyperkalaemia K>6 mmol/L	10 ml/kg 10% dextrose + 0.1 units/kg insulin
LABORATORY TESTS			
Send: Blood gas • Cross-match (4 units) • FBC • Coagulation screen • Fibrinogen • U&E / Creatinine / LFTs / Calcium • POCT if available			
TRANEXAMIC ACID (TXA)			
LOADING DOSE		MAINTENANCE INFUSION	
15 mg/kg (max 1 g) Dilute in 0.9% NaCl — give over 10 min		2 mg/kg/hr 500 mg TXA in 500 ml 0.9% NaCl or 5% glucose Run at 2 ml/kg/hr for ≥8 hours or until bleeding stops	
BLOOD PRODUCT RESUSCITATION			
Product	Volume	Protocol	
Packed Red Cells (PRC)	5 ml/kg	Start: 1:1 PRC:FFP (5ml/kg each) After 15ml/kg each (30ml/kg total): Add PLT 10ml/kg + cryoprecipitate 5ml/kg empirically if bleeding ongoing and no results back. Recheck FBC, coagulation, fibrinogen. Continue 1:1 until results. Blood type: O D-negative initially. O D-positive acceptable for boys. Switch to specific type when available. Consider irradiated/CMV negative for specific groups	
Fresh Frozen Plasma (FFP)	5 ml/kg		
Platelets (PLT)	10 ml/kg		
Cryoprecipitate	5 ml/kg		
Recombinant Factor VIIa †	20–180 mcg/kg		
† Recombinant factor VIIa is off-label in paediatrics			
RESULTS-GUIDED TREATMENTS AND GOALS			
Test	Threshold	Action	
Haemoglobin	< 100 g/L	Give PRC	
PT or APTT	> 1.5× normal	Give FFP	
Platelets	< 75 × 10 ⁹ /L	Give platelets	
Fibrinogen	< 1.5 g/L (after FFP)	Give cryoprecipitate	
Calcium	< 1.0 mmol/L	Calcium gluconate 10% 0.5 ml/kg slow IV over 10 min	
Ongoing bleeding	After above	Consider recombinant factor VIIa — discuss haematology	
NEONATE-SPECIFIC CONSIDERATIONS			
Blood volume: 90 ml/kg (term) · 80–90 ml/kg (<3 months) Threshold: same major haemorrhage criteria apply Products: Use irradiated, CMV-negative, leucodepleted blood products. Avoid large-volume FFP in neonates with cardiac compromise. Platelets threshold may be higher (>100×10 ⁹ /L in sick neonates — discuss haematology). Monitor glucose closely. Hypocalcaemia is especially common with rapid transfusion. Avoid NSAIDs and ibuprofen in neonates.			
COMMUNICATION & TEAM ROLES			
Team roles: - Lead clinician directs resuscitation - Coordinator liaises with blood bank - Two people to check blood, deliver blood and record volumes - Porter delivers blood and takes samples to lab - Complete major haemorrhage log sheet		Call on-call haematology registrar if: > 30 ml/kg PRC given - Second shock pack issued - Unusual product request - Recombinant factor VIIa discussion	
TREATMENT AIMS			
Temp >36°C Hb >100 g/L PLT >75 Fibrinogen >1.5 g/L INR/APTT <1.5 Ca >1 mmol/L K <6 mmol/L BD <6 mmol/L			



References

1. Lyttle M. Transfusion: Paediatric Major Haemorrhage Procedure. University Hospitals Bristol and Weston NHS Foundation Trust. Version 4.1, 2020. 2. Brighton & Sussex Paediatric Major Haemorrhage Protocol (2019) 3. BSH Guidelines: Neonatal Transfusion (2016) 4. BJA Education: Paediatric Major Haemorrhage (2018)

Disclaimer: For guidance only. Clinician responsible for all dose verification before administration. Review date: 2026

WATCH GUIDELINES

