MASSIVE HAEMORRHAGE ● 1/2

RECOGNITION AND ASSESSMENT

- Rare but potentially fatal neonatal event
- Can occur in the following situations:
  - damage to cord before clamping
  - massive placental abruption
  - massive acute feto-maternal haemorrhage
  - subgaleal haemorrhage
  - unintended scalpel injury during caesarean section

DEFINITION

- Actual/suspected blood loss with haemodynamic instability or
- Blood loss 2–3 mL/kg/hr

SYMPTOMS AND SIGNS

Hypovolaemia

- High/increasing heart rate (>160 bpm)
- Low/falling Hb or haematocrit
- Poor peripheral perfusion with slow central capillary refill (>3 sec)
- Low or falling blood pressure [mean blood pressure (MBP) <40 mmHg in a term baby]
- Presence of, or worsening, metabolic acidosis
- Echocardiography (if available) to assess volume status
  - small systemic veins and low ventricular filling volumes can indicate hypovolaemia

INVESTIGATIONS

- Crossmatch
- FBC
- PT
- APTT
- Fibrinogen
- U&E
- Ionised calcium
- Blood gases
- If feto-maternal haemorrhage suspected, request maternal Kleihauer test

Hb can be normal due to lack of dilutional effect – do not view as reassuring

IMMEDIATE TREATMENT

- Follow **Major haemorrhage pathway (MHP)** – see below

Group O RhD negative blood can be used whilst awaiting massive haemorrhage protocol blood products –
ALWAYS available on labour suite/obstetric theatres

Table 1: Products

Product	Unit
RBC (20 mL/kg)	Paediatric (<100 mL)
Plasma (20 mL/kg)	Neonatal fresh frozen plasma (100 mL)
Platelets (20 mL/kg)	Paediatric platelets (50 mL)
Cryoprecipitate (10 mL/kg)	Single donor (40 mL)

Table 2: Paediatric major haemorrhage pack contents

	Pack 1	Pack 2
Packed red cells	✓	✓
FFP	✓	✓
Platelets		✓
Cryoprecipitate		✓

- **Note:** Pack contents – these are not packs that actually exist, but provide a way of thinking through what should be needed in suitable ratios. Many centres will need to design and implement a local protocol between haematology and neonatal teams to plan for this eventuality, based on this structure and flowchart

SUBSEQUENT MANAGEMENT

- The following may be necessary, discuss with neonatologist:
- elective intubation and ventilation (following resuscitative blood and blood product replacement)
- inotropic support

DISCHARGE AND FOLLOW-UP

- Neurodevelopment follow-up for long-term neurological outcome

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Flowchart: Major haemorrhage pathway (MHP)