**Massive haemorrhage – UHL protocol**

**NB:** includes massive obstetric Haemorrhage

In **CHILDREN**, involve senior anaesthetist from the start to advise on the appropriate drugs and doses

- E.g. trauma team leader or equivalent – including ‘flying squad’ doctor

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**Massive haemorrhage – UHL protocol**

**ABCDEF** approach in appropriate environment
- Ensure suitably senior staff is involved **NOW**
- Give appropriate warmed IV crystalloid bolus
- Request / transfuse red cells if indicated, using O negative emergency blood if necessary (**NB:** Blood Bank must be informed if emergency blood is used to ensure resupply)
- Immediate haemorrhage control measures, e.g.
  - Direct pressure on wounds / nose if epistaxis
  - Pelvic binder for suspected unstable pelvic #
  - Tourniquet where indicated
- Beware hypothermia - use fluid warming devices and forced-air warming blanket (e.g. ‘ Bair Hugger’)
- Consider antifibrinolytic measures (see box 1)
- Reverse any anticoagulation – see ‘PCC clinician pack’ and ‘Bleeding on DOACs’ guidance on InSite
- Arrange cell salvage where available (see box 2)

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**Antifibrinolytic measures**

Consider tranexamic acid IV; in adults, give
- 1G (i.e. 10mL) neat as slow bolus over 10min

Children, give a 1.5mg/kg bolus (max 1G), then 2mg/kg for 8h in a convenient volume of 0.9% saline

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**Cell salvage**

Cell salvage machines are available from
- LRI
- GGH
- LGH

**Main theatres and obstetric theatres**

**NB:** For every 1L of salvaged red cells ensure balanced replacement of other blood components as follows:
- FFP
- Platelets
- Cryoprecipitate

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**When to declare**

*Typical scenarios include (but are not limited to)*

- Clinically obvious severe traumatic bleeding or collapse
- Haemorrhagic shock (e.g. systolic BP <70 initially or <50 after fluid bolus)
- >4 units (in children: >20mL/kg) red cells transfused within an hour AND similar further needs anticipated
- Bleeding rate 150mL/min
- 50% total blood volume loss in 3h

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**Laboratory test bundle**

- **Near-patient tests**
  - Venous blood gas – machines available in
  - LRI ED
  - GGH AMU
  - LGH ITU
  - CDU
  - CICU
  - ITU
  - depending on local availability also
  - FBC or Hb (HemoCue)
  - Thromboelastography (TEG)
  - Laboratory tests
  - FBC, U&Es, Ionized Calcium, INR, APTT and fibrinogen
  - LFT and G&G only initially

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**Bleeding control measures**

- **For obstetric haemorrhage**
  - See InSite documents UHLSP-600-6660 and UHLSP-600-7067
- **For gynaecological haemorrhage**
  - See InSite document 3691078451
  - See InSite document 8244s9188
- **For acute upper GI bleeding**
  - Consider interventional radiologist advice (e.g. for arterial embolization in pelvic fractures)
  - Consider ‘damage control surgery’
- **Haematology duty doctor can advise if the following products are indicated**
  - Recombinant activated Factor VII (rFVIIa) - see InSite document UHLSP-600-6623
  - Prothrombin Complex Concentrate (PCC)

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**Goal-directed adjustments**

**NB:** in children, involve anaesthetist ASAP to advise on appropriate dosing

- If fibrinogen <1 (<1.5 in obstetrics) Give Cryoprecipitate 2 adult pools
- If ionized Calcium <1 Give Calcium Chloride 10% 10mL IV over 5min
- If platelets <80 Give 1 adult therapeutic dose (ATD) of platelets; give 2 ATD if platelets <30
- If TEG trace abnormal Give appropriate products as guided by TEG treatment algorithm
- If INR or APTT >1.5 (NB: use those only in those areas where no TEG available) Give FFP 4 units

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**Red cells, FFP & cryoprecipitate**

Keep in cool box; return within 2h

**Platelets**

Return within 4h
Massive haemorrhage – UHL protocol

Massive haemorrhage pack (MHP) release sequence
For action by Blood Bank staff (Clinicians: for information only)

Notes to clinicians
• If cross-matched blood not yet available, red cells will be provided as
  • O negative (women aged <50 and children) or O positive (men); available immediately
    (NB: In this situation, the clinical urgency will outweigh any concerns about the untested
    possible presence of atypical red cell antibodies)
• Group specific (available within 20min)
• The first 4 units of FFP are available immediately
• Cryoprecipitate and further doses of FFP will require defrosting – this takes about 20min
• In children, transfusion of 5mL/kg red cells will typically raise Hb by 10g/L