Management of Major Haemorrhage (MH) in Trauma - Adults

**Recognise Major Haemorrhage**

- Estimated Blood Loss:
  - Blood loss of 150ml/min
- Haemodynamic Parameters:
  - Bleeding with a heart rate of >110 beats/min and/or systolic blood pressure <90mmHg or
  - Confirmed (or suspected) traumatic blood loss in the context of haemodynamic instability

**Activate the MH Pathway**

- Call for senior help
- Send baseline bloods
  - Secure IV access
  - Prepare a transfusion crossmatch
  - Assign team roles including communication lead
  - Early pelvic binder
  - Use emergency O negative blood
  - Haemodynamic Parameters:
    - Estimated Blood Loss
    - Blood loss of 150ml/min
    - Haemodynamic Parameters
      - Bleeding with a heart rate of >110 beats/min and/or systolic blood pressure <90mmHg
      - Confirmed (or suspected) traumatic blood loss in the context of haemodynamic instability

**Secure IV access**

- Take bloods urgently and send to the laboratory:
  - Pre-transfusion crossmatch sample
  - Full blood count (FBC)
  - Coagulation screen*: PT, APTT, Clauss fibrinogen (plus PT/APTT ratios if available)
  - Biochemistry including renal (U+Es), liver and bone profiles
  - Send a second pre-transfusion crossmatch sample when able to do so if no historical group

**Monitor and Correct**

- Consider tranexamic acid (TXA) bolus administered by paramedic
- If not, give TXA 1g IV over 10 minutes immediately (must be within 3 hours of injury)
- Follow the TXA bolus by a 1g infusion over 8 hours

**Transfuse and Monitor**

- Aim for Hb >80g/L
- Keep the patient warm and use blood warmer
- Transfuse Major Haemorrhage Pack 1 (Minimum of 4 red cell units and 4 FFP units)
  - Aim to maintain a packed red cell: plasma transfusion ratio of 1:1 for traumatic haemorrhage
  - Use pre-thawed FFP in MH Pack 1 where available
  - Laboratories may provide group O positive red cells for males over 18 and women of non-child-bearing potential (over 50 years) where suitable, change to group specific when able to do so

**Tailor component transfusion when blood results become available**, see ‘Aims for Therapy’ below

**Stand down**

- Consider, where appropriate:
  - Direct pressure/ tourniquet use
  - Topical haemostatic agents
  - Pelvic binder if suspected fracture
  - Early surgical intervention
  - Cell salvage

- Consider where appropriate:
  - Direct pressure/ tourniquet use
  - Topical haemostatic agents
  - Pelvic binder if suspected fracture
  - Early surgical intervention
  - Cell salvage

- If ongoing haemorrhage, order MH Pack 2 (do not wait until the end of Pack 1 to order)

**Limit Blood Loss**

- Until bleeding ceases, continue regular blood monitoring, repeat and tailor MH Pack 2 (aims below)

**Aims for Therapy**

- Haemogobulin 80-100g/L If haemoglobin falling - give red cells
  - Platelets >75x10^9/L If <75x10^9/L - give 1 adult dose (order if <100x10^9/L)
    - Maintain platelets >100x10^9/L if a traumatic brain injury (TBI) and consider increasing platelet threshold to >100x10^9/L, for ongoing haemorrhage
  - PT/APTT ratio <1.5 If >1.5 - give FFP (15-20mls/kg)
  - Fibrinogen >1.5g/L* If <1.5g/L* - give cryoprecipitate (2 pools)
    - *Maintain a fibrinogen >2.0g/L in pregnancy

**MH Pack 2**

- Contact the laboratory to confirm stand down when reached, document and debrief

---

**References**

1. Emergency department, NH, Haemoglobin, FFP, Fresh frozen plasma, PT, Prothrombin time, APTT, Activated partial thromboplastin time, TEG, Thromboelastography, ROTEM, Rotational thromboelastometry

[Last updated: 17th Jan 2020]