

Adult Massive Transfusion Protocol

Version 4.1 March 2019

Trauma

Emergency Department

Non-trauma

Other locations

Suspected critical bleeding

Should I activate Code Red?

Major trauma and **2 or more of the following:**

- Penetrating injury
- FAST scan positive for intra abdominal fluid
- HR > 120/min
- SBP < 90 mmHg

or

Major trauma and

- Senior clinician's suspicion of ongoing bleeding and circulatory failure despite volume resuscitation

- Bleeding > 150 ml/min
- Blood loss > 1500ml
- Loss of half the circulating blood volume in less than 2 hours
- Rapid blood loss leading to circulatory failure despite volume resuscitation

Activate **CODE RED 2222**

Request Pack A

Stop the cause of bleeding

Stop bleeding - apply physical methods. **Damage Control Resuscitation.** Identify occult source of bleeding.

Send bloods for baseline tests and ROTEM.

Transfuse Red Cells and up to 6 g Fibrinogen concentrate: Aim for Hb 100g/L and FIBTEM A5 ≥ 10 mm

Drugs

Tranexamic acid 1g if within 3h of injury. Reverse **warfarin** (give Octaplex). DOACs - seek Haematology advice.

if ongoing bleeding **Request Pack B**

Repeat ROTEM.

Transfuse Red Cells and up to 6 g Fibrinogen concentrate. Ensure Hb 100g/L and FIBTEM A5 ≥ 10 mm

Give additional products according to ROTEM

if ongoing bleeding after 6 units of Red cells **Request Pack C**

Give Platelets (Pack C). Ensure Hb 100g/L; FIBTEM A5 ≥ 10 mm and EXTEM A5 > 35 mm

Give additional products according to ROTEM

if patient still bleeding or ROTEM unavailable **Request Pack D**

Targets

Bloods

Hb 90-100 g/L,
FIBTEM A5 > 10 mm
EXTEM A5 > 35 mm; EXTEM CT <85s
Platelets > 50 x 10⁹/L
Fibrinogen > 2.0 g/L

Metabolic

Temp > 34 deg C
pH > 7.2
iCa > 0.5 mmol/L

Haemodynamics

Systolic BP 80-100mmHg.
If Traumatic Brain Injury - Mean BP ≥ 80 mmHg
Ensure cardiac output is adequate (CI > 2.5)

Excessive transfusion = worse outcomes

Hb 90-100 g/L is enough - Re-check Hb and ROTEM to guide ongoing resuscitation.

Packs

Pack A or Pack B

Red cells - 4 units
Fibrinogen concentrate - 6g

Pack C

Platelets - 1 pool

Pack D

Red cells - 4 units
Platelets - 1 pool
FFP - 4 units
Cryoprecipitate - 4 units



Priority tasks	Personnel <ul style="list-style-type: none"> • Call for senior clinician and assistance • Appoint a Transfusion Coordinator • Identify dedicated blood porter • Inform Theatres if appropriate 	Patient care <ul style="list-style-type: none"> • Immediate physical methods to stop bleeding • Give Tranexamic acid • Warm patient; warm fluids; warm room • Monitor blood pressure directly 	Investigate <ul style="list-style-type: none"> • FAST scan if trauma • Look for occult source of bleeding • Monitor cardiac function by ECHO or ODM
Other tasks	Send blood for these tests <ul style="list-style-type: none"> • FBC • ROTEM • Clotting • Fibrinogen 	Monitor <ul style="list-style-type: none"> • Arterial blood gas: Hb, Lactate, Base deficit • Repeat ABG and ROTEM every 30 mins until patient stable • iCa if available 	Hypocalcemia Consider treating hypocalcemia if ionised [Ca] < 0.9 mmol/L
Ring Transfusion	Give patient information <ol style="list-style-type: none"> 1. Name 2. Gender 3. Age 4. Date of Birth 5. Weight - estimate 6. Hospital number 	Communication <ul style="list-style-type: none"> • Agree telephone extensions to call • Deviate from MTP advisory packs if ROTEM suggests alternative treatment required 	Warfarin + major bleeding <ul style="list-style-type: none"> • Request Octaplex if INR > 1.5 • Give 30-50 IU per Kg • Maximum dose is 3000 IU

A5 - amplitude (mm) at 5 min for FIBTEM and EXTEM	FIBTEM < 10mm	Give 4-6g Fibrinogen concentrate or 4 packs of CRYO
	FIBTEM ≥ 10mm	Check EXTEM
	EXTEM < 35mm	If FIBTEM A5 < 10mm - give 4-6g Fibrinogen concentrate or 4 packs of CRYO If FIBTEM A5 ≥ 10mm - give PLATELETS
	EXTEM ≥ 35mm	No further blood products if FIBTEM A5 ≥ 10mm and EXTEM CT < 85s
CT - clotting time (s) for EXTEM	EXTEM CT < 85s	No further blood products if FIBTEM A5 ≥ 10mm and EXTEM A5 ≥ 35mm
	Extem CT ≥ 85s	If FIBTEM A5 < 10mm - give 4-6g Fibrinogen concentrate or 4 packs of CRYO If FIBTEM A5 ≥ 10mm - give PLATELETS (EXT A5 < 35 mm) or FFP (EXT A5 ≥ 35mm)

