CLINICAL GUIDELINE

ADULT MASSIVE HAEMORRHAGE PATHWAY (MHP) AND CODE CRIMSON PROTOCOL

Applicable to: **Te Whatu Ora – Health New Zealand | Te Pae Hauora o Ruahine o Tararua | MidCentral**	Issued by: **Emergency Department** Contact: **Emergency Department, PNH**

1. PROTOCOL ACTIVATION CRITERIA

The massive haemorrhage pathway (previously known as Massive Transfusion Protocol or MTP) and code crimson protocol must be activated for a specific patient when the patient has been assessed as requiring the protocol for massive and rapid bleeding by an experienced medical practitioner.

2. CLINICAL GUIDELINE

2.1 Blood bank should be notified immediately of MHP or Code Crimson activation.

2.2 Obtain group specific red cells from blood bank if none available obtain units of O Neg red cells from theatre or blood bank and ensure Blood bank is notified if A/Hours supply of O Neg red blood cells used from OT.

2.3 Each Box will be made ready for issue upon release of the preceding pack but will only be issued on request.

2.4 To avoid any delay in receiving the required units of blood products an orderly needs be assigned specifically to this role.

2.5 On receipt of each Box or every 30mins a coagulation screen bloods must be requested.

2.6 Contact Blood bank ph 8558 to speak to the Transfusion Medicine Specialist on call or the haematologist on call for advice if needed. Between 2400hrs - 0800hrs contact blood bank via the operator if they are not already on site.

2.7 Blood Bank MUST be informed when the MHP or Code Crimson is ceased to prevent wastage.

3. APPENDICES

MidCentral Adult Code Crimson Flow Diagram (Emergency Department) (print on A3)

MidCentral Adult Code Crimson Flow Diagram (Operating Theatre) (print on A4)

4. KEYWORDS

Mass transfusion, Code Crimson, Bleeding, Trauma, Abnormal coagulation, Shock, Haemorrhage

CODE CRIMSON - ABC Score

- **Penetrating** mechanism = 1
- **SBP ≤ 90** mmHg = 1
- **Positive eFAST*** ** = 1
- **HR ≥ 120 bpm** = 1

Code Crimson requires senior clinician approval and input, as activation identifies the highest risk trauma patients and needs a multi-service approach.

****eFAST** scan accuracy relies on the skill level of the practitioner*

Team Leader of the Resuscitation

- The team leader is the decision maker including activation of the MHP once the stat packs have been transfused
- Send urgent group & screen to blood bank
- Ensure Tranexamic Acid is administered, as a bolus through a fast flowing IV line

MHP Coordinator (e.g. Guardian, Coordinator)

- Supports the team leader
- Once the MHP has been activated, communicate with the blood bank team

Tasks (Delegated as Necessary)

- Once stat packs have been transfused re-evaluates the patient alongside the team leader to evaluate the need for continuation of the MHP.
- If required after stat pack - activate MHP, state which MHP pathway (i.e. code crimson/standard/obstetric MHP)
  - If senior clinician requests MHP activation immediately, stat pack is still issued while the blood bank prepares pack 1/pack 2
- Ensure blood bank have your name and contact number
- Organize adequate orderly/health care assistant support
- Repeat MHP bloods every 30mins
- Ensure 1g Calcium given with every MHP pack *(10mL Calcium Chloride 10% or 30mL Calcium Gluconate 10%)* as a bolus through fast flowing line
- Hand-over coordination role if patient location changes; ensure blood bank notified of new coordinators name and number
- Cease MHP once the patient is clinically stable, inform blood bank, move to targeted therapy
- Ensure transfusion documentation / checklists maintained; all swing labels retained

****Smaller Centres should** check Full Blood Count BEFORE giving platelets, avoid transfusing if PLT > 75 x 10^9/L

Blood Bank Tasks

- Process group & screen ASAP
- Liaise with MHP coordinator
- Release Stat Pack and MHP Packs as per protocol / SOP
- Notify NZBS TMS as per SOP & manage inventory
- Maintain Blood Bank Tracking Sheet / Checklist documentation and eTraceline records

****Smaller Centres BEFORE releasing Pack 3**, liaise with MHP coordination role to confirm PLT count is < 75 x 10^9/L and platelets clinically indicated

Infusion Standards

- RBC, FFP, Cryoprecipitate:
  - warmed
  - standard blood infusion set
- Platelets:
  - warmed or room temp
  - new infusion set preferred, not essential

Clinical Targets

- Surgical/radiological **control of bleeding** ASAP
- Normal **pH/base deficit**
- Normal body **temperature**
- **A lower MAP** may be tolerated until bleeding slowed - unless brain injury

MHP Runner

- Identified by MHP runner and works with MHP coordinator

Adult Massive Haemorrhage Pathway And Code Crimson

Massive Bleeding PLUS Shock Signs or
HR > 120 or SBP < 90

Code Crimson	Standard MHP	Obstetric MHP
Trauma + ABC Score ≥ 2 + senior clinician approval	Medical or Surgical Bleeding	
2g Tranexamic Acid (Includes pre hospital dose given)	**1g Tranexamic Acid**	**1g Tranexamic Acid**

Send Group + Screen (Pink Top)
Initiate: Call Blood Bank **8558**, Provide Patient Details + Request
State "I am requesting (Code Crimson, Standard, Obstetric) Stat Pack"

Code Crimson Stat Pack	Stat Pack	Obstetric Stat Pack
2 RBC, 2 FFP	2 RBC	2 RBC

Reassess: Ongoing Massive Bleeding + Shock: Call Blood Bank
Activate MHP stating "I am activating **(Code Crimson, Standard, Obstetric) MHP**" **+ Identify MHP Coordinator**

Code Crimson	Standard Pack 1	Obstetric Pack 1
Straight to Pack 2	2 RBC, 2 FFP	2 RBC, 3 Cryo

Pack 2
4 RBC, 4 FFP
3 Cryo

1g Calcium with every pack

Pack 3
4 RBC, 4 FFP
1 Platelet*

(*see notes page 2)

Alternating packs 2 & 3 until bleeding slowed

Then stop MHP (call Blood Bank 8558), and start targeted transfusion

Bloods:
Medlab *923,*924
- **repeat every 30min**
- Blood gas
- FBC (purpleTop)
- APTT, INR (blue Top)
- Fibrinogen (blue Top)
- +/- **TEG** (blue Top) (OT 4 Anaesthetic Room Ext 7554)

Coagulation Targets	If Not, Give
PR < 1.5 | APTT < 40	4 U FFP
Fibrinogen > 2g/L	3 U Cryoprecipitate
Platelets > 75×10^9/L	1 U Platelets**
Ionised Ca^{2+} > 1.1 mmol/L	1g Calcium

Obstetric Haemorrhage
- Manage Tone, Trauma, Tissue, Thrombin causes of haemorrhage
- Repeat Transexamic Acid 1g 30 min after initial dose if significant ongoing bleeding

Reverse Anticoagulation
Warfarin Reversal 3-5mg IV Vitamin K and 25-50 units/kg prothrombinex
Dabigatran Reversal – Idarucizumab 5g IV
Rivaroxaban Reversal – Prothrombinex 50units/kg

ABC score ≥ 2/4	
Penetrating Injury	1 pt.
SBP ≤ 90	1 pt.
Pulse ≥ 120	1 pt.
Positive E-FAST scan	1 pt.