Te Whatu Ora
Health New Zealand

Trauma Code Crimson

Trauma Code Crimson

Trauma Call Criteria met on R40

Penetrating mechanism	(1)
Systolic BP < 90mmHg	(1)
Pulse rate > 120BPM	(1)
+ve E-FAST	(1)
Score	

Score 2, 3 or 4

1. **Emergency Department (ED) Charge or Specialist organise:**

   - 777 Trauma Code Crimson with expected time of arrival (ETA) in Adult ED _____:_____ hrs

2. **ED Charge Nurse to ensure the following teams are contacted with, Trauma Code Crimson and ETA:**

   - Anaesthetist 021 496 374 ○
   - L8 Nursing Coord. 021 492 086 ○
   - Blood Bank Ext 24015 ○
   - Radiology Registrar 021 412 581 ○

3. **Surgical Registrar to contact on call Surgical Consultant** ○

4. **If Emergency Department Specialist not in hospital, to be contacted by Charge Nurse** ○

Score 0 or 1

If Trauma call Criteria met:

- 777 Trauma Call with ETA in Adult ED _____:_____ hrs

What is Trauma Code Crimson?

This is an activation of additional staff for critically ill trauma patients who are highly likely to require urgent surgery, interventional radiology and imaging and/or a massive haemorrhage protocol (MHP).

What is the aim of activating a Trauma Code Crimson?

Early access to definitive care and treatment for patients with major trauma.

This project is in collaboration with Auckland HEMS and New Zealand Blood Service.

Auckland HEMS carry whole blood and tranexamic acid for pre-hospital use for the most severely injured patients.

Which patients should have Trauma Code Crimson activated?

Patient would meet criteria for a standard Trauma Call activation on R40 (pre hospital notification) or at any time while in the Adult Emergency Department (ED).

PLUS

An Assessment of Blood Consumption score (ABC) score of two (2) or more.

The Trauma Team Leader feels the patient is likely to require an urgent operative or interventional radiological intervention.

Mandatory Trauma Call

R40	• R40 ambulance call for unstable (status 1 or 2) trauma patient
Unstable physiology	• RR < 10 or > 29 • SBP < 90mmHg • GCS < 13
Injury	• Penetrating injury to the head, neck or torso • Flail Chest • Complex pelvic injury • 2 + long bone fractures • Traumatic amputation proximal to the knee or elbow • Major crush injury • Paraplegia or quadriplegia
Transfer	• Transfer of major trauma patient from another hospital
Multiple	• Multiple casualties (6 or more patients)

A discretionary trauma call can be made by the Emergency Medicine SMO or registrar.

- This may be on the basis of mechanism, physiology, co-morbidities or a combination of these.
- It should especially be considered for an elderly patient.

What is the ABC score?

It is a score out of four (4) made up from:

1. Penetrating mechanism of injury
2. Systolic Blood pressure of 90mmHg or less
3. Pulse of 120/min or more
4. Positive trauma E-FAST ultrasound scan

You score one (1) point for each of the above.

The higher the score the higher the probability the patient will require a MHP activation. We have chosen a score of two (2) or more as this 75% sensitive and 62% specific for predicting the need for massive transfusion.

ABC score was chosen as it is easy to do as it doesn't require any laboratory testing to do the score so it can be done on information obtained from pre hospital staff (HEMS has ultrasound capabilities.

The ABC score was not designed to predict who would require an urgent operative or interventional radiological intervention, but it stands to reason, if you have a score of three (3) or four (4) despite appropriate resuscitation, the likelihood of requiring an urgent operative or interventional radiological intervention increases.

Who can activate a Trauma Code Crimson?

- Auckland HEMS clinical team via R40 communication
- ED Senior medical decision maker or ED Charge Nurse on R40 communication from pre-hospital team
- Trauma Team leader

How is the Trauma Code Crimson activated?

The Trauma Team Leader and or the ED Charge nurse reviews the available R40 information; or reviews the patient and Trauma Code Crimson activation criteria is met.

Call 777 stating Trauma Code Crimson in Adult Emergency Department.

PLUS

Emergency Department Charge nurse will ensure that below additional teams are contacted –

Role	Contact
On-call Anaesthetist	021 496 374
Level 8 Nursing Coordinator	021 492 086
Blood Bank	Ext. 24015
Radiology Registrar	021 412 581

- On-call **Surgical Registrar contacts the on-call Surgical Consultant**.
- If there is no Emergency Medicine Specialist in the hospital, they should be contacted by the Fellow, MOSS or Senior ED Registrar.

What should happen in Resuscitation room prior to patient arrival?

1. Roles of Trauma Team members clearly allocated by Trauma Team Leader.
2. Personal protective equipment donned, and equipment prepared.
3. Belmont fluid warmer / rapid infuser should be primed.
4. Orderly tasked to fetch O-negative blood from Blood Bank – not to be opened unless indicated to by Trauma Team Leader and returned to Blood Bank as soon as it is deemed blood is not needed.
5. Emergency Red cart brought to designated resuscitation bay. Contains –
    - Intraosseous access equipment
    - Thoracotomy equipment
    - Tourniquet
    - Pericardiocentesis equipment
6. Ultrasound brought to resuscitation bay and turned on.

What is expected from the additional activated staff?

1. **DCCM Registrar** to attend as per usual Trauma Call
2. **ED Registrar** to attend as per usual Trauma Call –
   - Notify ED SMO if not in Hospital.
3. **On-Call Surgical Registrar**
   - Attend as per usual Trauma Call.
   - Contact the on-call Surgical Consultant and tell them there is a Trauma Code Crimson in X minutes.
4. **Emergency Medicine Specialist**
   - If not in the hospital to come in and attend the resuscitation. (Mandatory attendance)
5. **On-call Surgical Consultant**
   - Mandatory attendance.
   - Introduce yourself to team leader.
   - Aid early decision making re need for intervention / OR.
   - Procedural support as required.
6. **Level 8 Anaesthetic Coordinator**
   - Call Level 8 Specialist on-call (mandatory attendance).
   - Get Operating Room ready for major trauma.
   - Attend resus., as able. Introduce yourself to Team leader.
   - Your primary purpose is to expedite the movement of the patient from the ED to OR or Interventional Radiology as required.
   - You may also be asked to assist with airway management, intravenous or invasive monitoring access.
   - There may be occasions where there is no immediate actions you need to undertake.
7. **Level 8 Nursing Coordinator**
   - Facilitate early OR availability as needed.
8. **Blood Bank**
   - Send three (3) units of O-negative blood to Resuscitation room.
   - The first box of the Code Crimson MHP to be thawed but not to be sent to the Resuscitation room unless MHP activated.
9. **Radiology Registrar**
   - Let on CT MRT know so that they can prioritise CT workload to ensure that no major delays.
   - Notify the on call Interventional Radiologist.
   - Feedback CT findings as soon as possible to the Trauma Team.
   - Communicate again with the Trauma Team Leader if there are interpretive or management changes after Interventional Radiology imaging review.

When should a Trauma Code Crimson be de-activated?

- Once it is clear that the patient does not require immediate surgical or interventional radiology.
- This should ideally occur within 30 minutes of patient arrival in the emergency department.
- The patients' vital signs should stabilise / normalise so that there is time for further diagnostics before a decision is made on surgical or interventional radiology.

Who should de-activate the Trauma Code Crimson?

Trauma Team Leader or Emergency Department Charge Nurse shall deactivate the Trauma Code Crimson by contacting –

Role	Contact
On-Call Surgical Consultant	By Surgical Registrar
On-call Anaesthetist	021 496 374
Level 8 Nursing Coordinator	021 492 086
Blood Bank	Ext. 24015
Radiology Registrar	021 412 581

Review and Audit

We will regularly review and audit all Trauma Code Crimson cases to ensure that –

- The Trauma Code Crimson is being used appropriately.
- The patients are getting the best possible care.
- There has been appropriate use of resources.

We will also review any cases that are identified by the Trauma Service that may have benefited from a Trauma Code Crimson but didn't receive one.

We will put out a quarterly report on all such cases.

If any significant issues are highlighted early on, they will be addressed as needed, otherwise we will review the process after 12 months.

ED Individual Instruction Cards

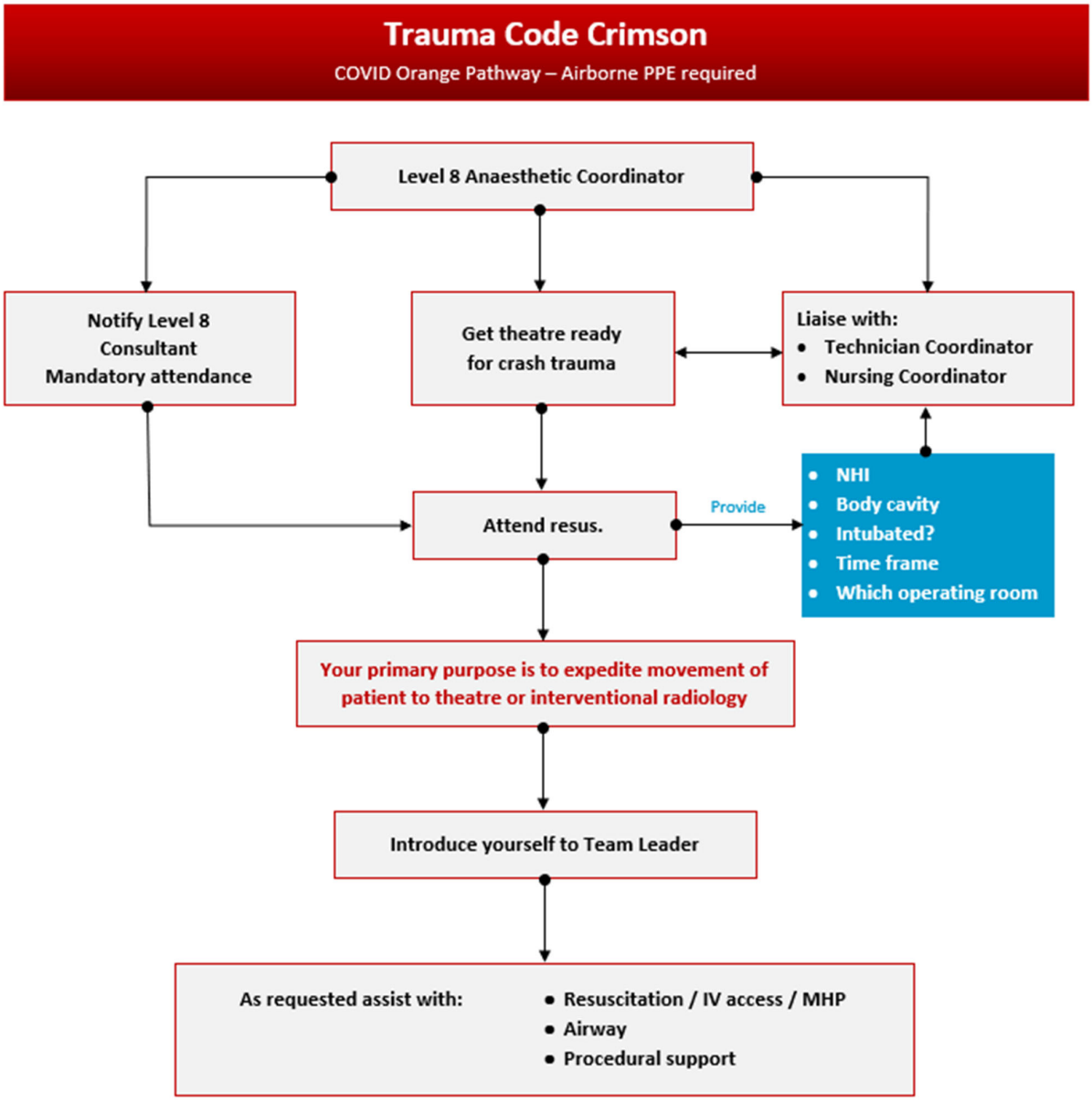
Link: https://adhb.hanz.health.nz/adult-medical/AED-CDU/Pages/Code-Crimson.aspx

Adult Massive Haemorrhage Pathway

Link: https://adhb.hanz.health.nz/Toolkit/Adult%20Massive%20Haemorrhage%20Pathway.pdf

Level 8 Operating Rooms: Code Crimson Pathway

Anaesthesia Coordinator



Provide info to OR asap:

- NHI
- Operative region
- Time Frame
- Haemodynamic status / MHP
- Lines and Tubes

OR Preparations to Receive Code Crimson

A standardised approach to setting up for major cases helps all staff involved share the cognitive load and reserves the team leader 'bandwidth' for clinical decision making.

On notification of major trauma in ED

- Identify OR (after hours, ideally OR 8 or 13)
- Warm room: 24°C
- Staff allocated
- PPE trolley
- Donning and Doffing areas
- Anaesthetic Drugs and equipment ready

Team Brief

Allocation of roles

On notification of transfer to OR

- Open SAFERsleep
- Prime Rapid Infuser
- HCA to Blood Bank for MHP

On Patient Arrival in OR

ED Team Leader Handover

- Unless major resuscitative measures underway all staff pause for the brief before transferring patient to OR table.
- **30 second I-MIST AMBO**
- Reason for OR and immediate priorities / lines and tubes

Transfer patient to OR bed

- Transfer to OR monitoring (return ED monitoring asap)
- Large bore IV / RIC established
- Attach OR rapid infuser and start MHP / volume resuscitation (return ED Belmont asap)
- IA access if possible
- Patient fully prepped & draped with surgeons scrubbed/ready to go before induction
- Rapid Sequence Induction
- Record knife to skin (KTS) time
- Damage Control procedure and Resuscitation
- Nurses to notify at 1 hour post KTS

End of Damage Control

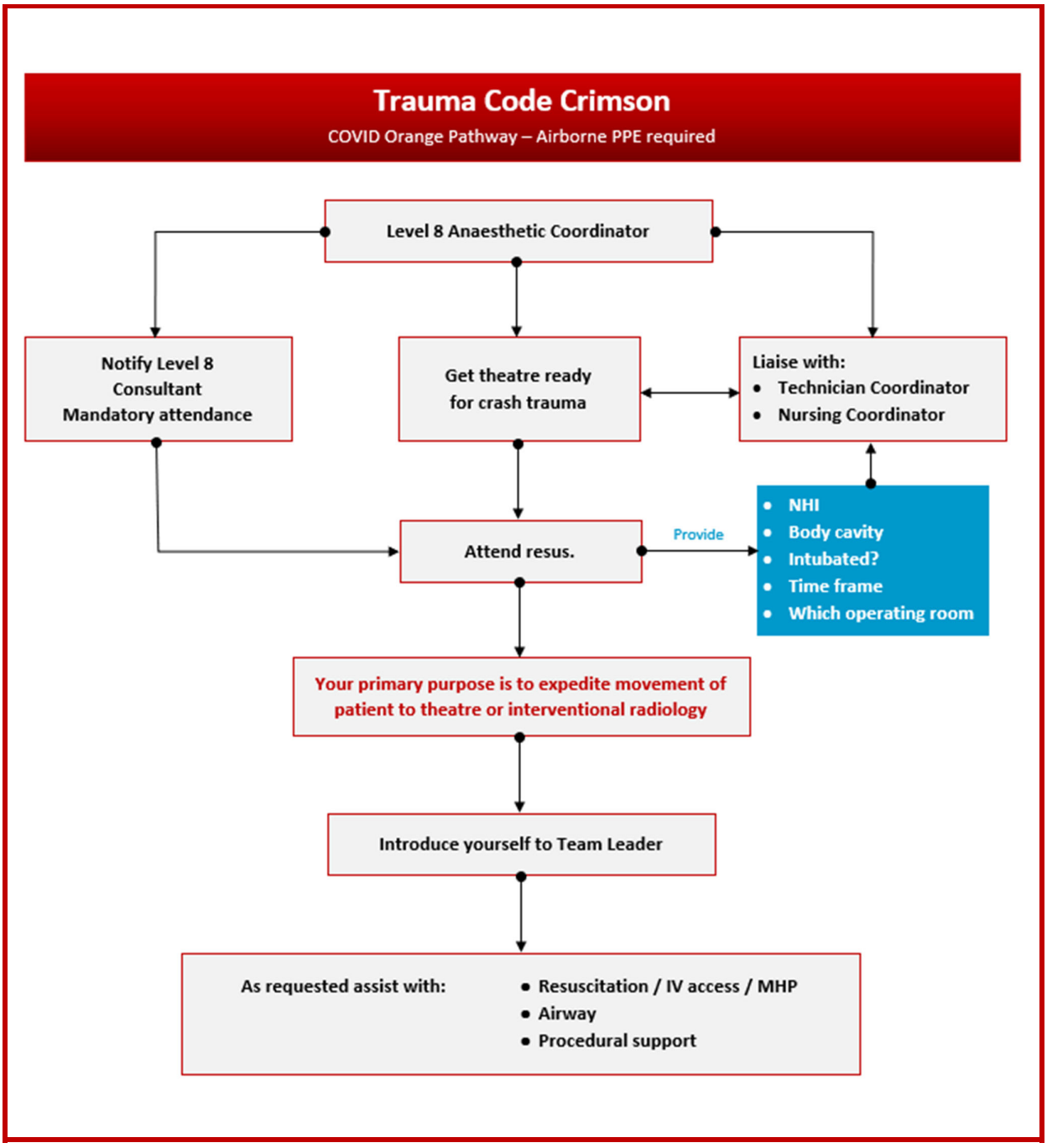
- Team Huddle (Anaesthesia, Surgical, +/- ICU)
- Plan for next priority (DCCM or CT / Angio etc)
- Ongoing problems / concerns
- Transfer to DCCM / Angio etc

HOT team brief as required

Code Crimson

Operating Room

Task Cards



Provide info to OR asap:

- NHI
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- Lines and Tubes

Code Crimson: Nursing Floor Coordinator

ORANGE PATHWAY

- **Phone call received**
  - Assign OR (Ideally OR 8 or 13 if after hours)
  - Warm room / bed: 24°C
- **Staffing**
  - Assign Room Leader
  - Adequate / Appropriate Staff? (RNs, RATs, HCAs)
  - If you need more help: **Think:** on-call, level 9, PACU:

    Think: skill mix, vulnerability etc
  - Assign 2 HCAs (1 x MHP runner and 1 x patient / equipment)
- **Liaise with ED / Surgeon / Anaesthetic Coordinator**
- **Ensure Booking Form / Patient Details / Operative Plan received**
- **Crowd Control**
- **Help ED doff / exit**

Code Crimson: Anaesthetist in OR

- **OR Preparation: Anaesthesia**
  - Warm room 24°C
  - Drugs / Equipment ready
- **Team Brief**
  - Share known information (status, injury, plan etc)
  - Priorities on arrival
- **Allocate anaesthetic roles PRIOR to arrival**
  - Team Lead / drugs
  - Airway / Ventilation
  - IV access / Belmont / MHP (+/- Transfusion Coordinator)
  - IA
  - Scribe
  - +/- CVL
- **Nominate a Transfusion Coordinator (Tech or Anaesthetist)**
- **Nominate second person to check blood (RN or second tech)**
- **On Notification of Transfer to OR**
  - Open Safersleep
  - HCA to Blood Bank for MHP

Transfusion Coordinator (Anaesthetist or Technician)

1) Run Belmont
2) Check blood with second RN / tech
3) Communicate with HCA runner and Blood Bank re required products
4) Check TXA given
5) ABG every 30 minutes
6) Calcium every MHP pack
7) When appropriate inform Blood Bank to pause / stop MHP

Code Crimson: Anaesthetic Technicians

- **OR Preparation**
  - Standard airway equipment + video laryngoscope, RSI
  - Ultrasound scanner (probe sheath on)
  - Peripheral access tray, 16G, 14G + RIC set-up
  - IA access tray
  - CVL available, MAC CVL if peripheral access is not possible
  - Double pressure transducer
  - Fluid warmer
  - Rapid infusion device – Belmont primed
  - At least three (3) syringe drivers
  - Tray for ABG, TEG, FBC, G&H
  - Room temperature up
  - Underbody Bair Hugger
  - Allocate roles prior to patient arrival

Code Crimson: Anaesthetic Technicians Roles

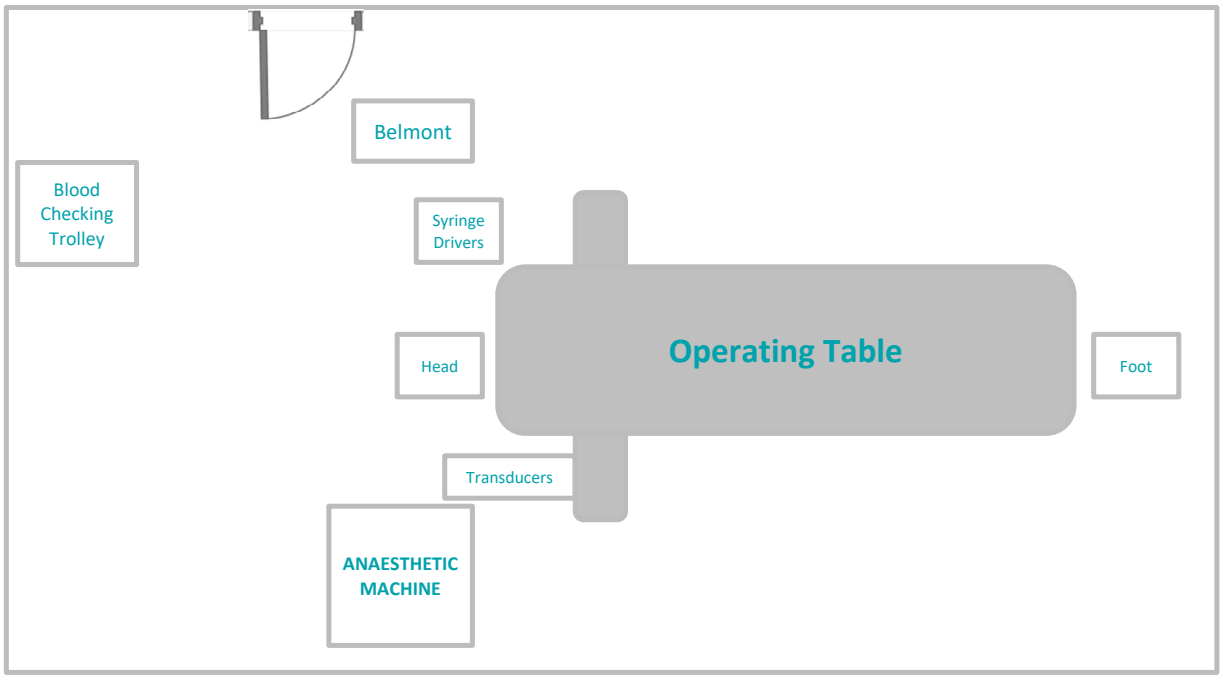
- **Tech 1**
  - Monitoring on / return ED monitoring
  - Assist with arterial line
  - Assist with RSI
  - Take blood samples ABG, TEG, FBC and G+H
  - Maintain stock levels, syringes, drugs etc.

  +/- Assist with CVL / MAC insertion

- **Tech 2**
  - Assist with peripheral access +/- RIC
  - Attach and run Belmont
  - Check blood with second RN / tech

  +/- Transfusion coordinator

Suggested OR Set-up



Code Crimson Nurse 1: Room Leader

- **Liaise with Floor Coordinator:**
  - Confirm surgical plan
  - Assign nursing roles (Scrub and Circ)
  - Confirm availability of PACU staff / extra hands
- **Room preparation:**
  - CODE CRIMSON TROLLEY/PPE outside room
  - Donning and Doffing areas
  - Emergency case cart to prep room
  - Assign blood checking role and area
- **Surgical setup preparation:**
  - Open emergency case cart if proceeding
  - Extra surgical instruments (retractors, consumables etc)
  - Essential items (e.g. swabs, suction, diathermy, sutures, cell saver etc)
  - Emergency equipment (sternal saw & blade)
- **Scrub Nurse support:**
  - Open instrumentation for scrub
  - First count with scrub if time / otherwise DATIX / x-ray after
- **+/- Circulating Nurse support:**
  - Help with patient transfer & positioning, documentation, etc
  - Establish & clear out space for surgical setup, ensure sterility
- **+/- Crowd control:**
  - Ensure traffic flow maintains sterility of surgical setup
- **Communication:**
  - Participate in Time Out
  - Share concerns about surgical setup etc
- **Record KTS time on White Board and tell team at 1 hour**

Code Crimson Nurse 2: Circulating

- **Liaise with Floor Coordinator / Anaesthetist:**
  - Confirm location of patient & transfer plan / timing
- **Support Scrub and Room Leader as required**
- **Liaise with ED team:**
  - Receive handover from ED nurse
  - Return ED equipment (monitor, transfer trolley, etc.)
- **Patient care:**
  - Transfer patient to OR table
  - Assist anaesthetic team with intubation if necessary
  - Position patient
  - Sign in
  - Document patient cares in PIMS
- **Anaesthetic support:**
  - Help with blood checking if possible

Code Crimson Nurse 3: Scrub

- **Equipment:**
  - Emergency case cart to prep room
  - Ensure adequate supply of essential items (e.g. swabs, suction, diathermy, sutures, cell saver etc)
  - Easy access to emergency equipment (e.g. sternal saw & blade)
  - Actively seek info about surgical plan from surgeons
  - Count or DATIX as time allows
- **Scrub preparation:**
  - Complete instrument set up
  - Prioritise emergency equipment
  - Enter OR & complete count if time, or DATIX / X-ray if not
  - Maintain sterility & monitor traffic flow
  - Assist with skin prep & draping prior to induction
- **Communication:**
  - Communicate with circulating nurse / Room Leader
  - Provide update when significant change occurs

Code Crimson: Health Care Assistants

- **Liaise with Floor Coordinator:**
  - Confirm location of patient & transfer plan / timing
  - Liaise with other HCA available to assist
  - Allocate tasks
- **HCA 1: Room preparation & equipment:**
  - Prepares PAT slide & sliding sheets on bed for patient transfer
  - Collect equipment & supplies as requested
  - Help with patient transfer & positioning
- **HCA 2: MHP runner:**
  - Liaise with Room Leader / Transfusion Coordinator for MHP
  - Go to blood bank to retrieve MHP boxes
  - At conclusion of MHP, return unused product to blood bank
- **If resuscitation required:**
  - Assist with compressions as necessary

Code Crimson: ED Team Leader

- **ED Handover:**
  - Unless major resuscitative measures underway, all staff pause for the brief from ED Team Leader **before** transferring patient to OR table

- **30 second I-MIST AMBO**
  - **I**ntroduction / Identification of patient
  - **M**echanism
  - **I**njuries
  - **S**igns and Symptoms
  - **T**reatments / Lines and tubes

    +/- **A**llergies

    +/- **M**edications

    +/- **B**ackground

    +/- **O**ther information

- **Outstanding issues / Priorities**
- **Any questions?**

Code Crimson: Surgeons

- Inform Consultant Surgeon as soon as **CODE CRIMSON** declared
- Liaise with OR Nursing Coordinator and anaesthetist: Injuries and likely operation / cavity
- To remain with the patient at all times

- **Team Briefing on arrival to OR**
  - Blunt / Penetrating
  - Suspected / known injuries
  - Priorities
  - Surgical Plan
  - Extra equipment required

- **Scrub up**
  - Prepare/drape patient before RSI if not intubated
  - Knife to skin (KTS) once ETT confirmed

- **Adhere to Damage Control Principles – Aim for operative time < 1 hour**
  - 1. Stop Haemorrhage
  - 2. Prevent Contamination
  - 3. Preserve physiology over anatomy

- **Regular recap**

- **Nurses to notify 60 min after KTS**
  - Alter plan according to physiology
  - Pack & temporary abdominal closure as appropriate

- **Team Huddle at end of procedure**
  - Ensure decision making / plan clearly documented
  - Write operative note

Code Crimson: Patient Arrival in OR

- Handover
- Monitoring attached / return ED monitor
- Large bore IV / RIC established
- Ensure MHP available and checked
- Attach Belmont and start volume replacement
- IA access if possible
- Patient fully prepped and draped / surgeons scrubbed prior to induction
- Induction / RSI
- Record KTS time
- Damage control procedure: Lifesaving only (aim for ≤ 1 hr)

Code Crimson: Recap

- 15-minute interval mandatory communication with team
- Surgical progress
- Number of blood products transfused & CV stability
- ABG, TEG and temperature
- Problems and priorities

Code Crimson: End of Damage Control

- Team Huddle (Anaesthesia, Surgical +/- ICU)
- Plan for next priority (DCCM or CT / Angio etc.)
- Ongoing problems / concerns
    - Surgical
    - Anaesthesia
    - Nursing
    - Technician
- Transfer to DCCM / Angio etc
- HOT team brief as required