Trauma System Implementation Programme

The Trauma Team

November 2024

Trauma Care Ireland

Seirbhís Sláinte Níos Fearr á Forbairt | Building a Better Health Service

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Glossary of Terms

Trauma	Trauma is a term which refers to physical injuries of sudden onset and severity which require immediate medical attention.
Trauma Team	The Trauma Team, for the purpose of this paper, and as defined by the Major Trauma Audit (MTA), is a team specifically trained for and equipped in specialist trauma care.
Major Trauma	Major trauma describes serious and often multiple injuries where there is a strong possibility of death or disability.
Major Trauma Centre (MTC)	Acute hospitals that provide the highest level of specialist trauma care to the most severely injured patients on a single hospital site. In the new Trauma System for Ireland, the designated Major Trauma Centres are the Mater Misericordiae University Hospital (the MMUH) and Cork University Hospital (CUH).
Trauma Unit with Specialist Services (TUSS)	The National Trauma Strategy recommends the development of University Hospital Galway as a Trauma Unit with Specialist Services, given the breadth and depth of services currently provided and travel distance from the nearest Major Trauma Centre. It will have additional resources and expertise above Trauma Unit status and be equipped to manage most major injuries.
Trauma Units	A number of acute hospitals across the country will be designated as Trauma Units, which will provide definitive care for the majority of patients who do not need the specialist expertise of an MTC. Within the current framework of this document, this refers to candidate Trauma Units as the formal Trauma Unit accreditation process to bring individual hospitals fully to Trauma Unit standard is ongoing and is expected to take three to five years.
Local Emergency Hospitals	These are hospitals designed to be bypassed for major trauma, however it is acknowledged that severely injured patients may self-present and so plans need to be in place for life-saving interventions and expedited transfer.

1. Introduction

1.1. Current configuration of Trauma Services and rationale for Trauma Teams

The MTA in 2021 reported that only 8% of major trauma patients admitted to hospital are received by a formal 'Trauma Team', as defined by the MTA'. A Trauma Triage Tool (TTT - see Appendix 1A.) has been developed, to be used by all pre-hospital emergency services, and is designed to identify patients who may have sustained major trauma so the receiving hospital can receive a 'pre-alert' to activate the trauma team response.

The following KPIs will be monitored through the Major Trauma Audit;

- the number of pre-alerts for major trauma patients
- the number of pre-alerted patients who receive a Trauma Team reception
- the number of pre-alerted patients who receive a Trauma Team Reception led by a consultant Trauma Team Leader
- CT head scans completed within 1 hour where indicated.

Trauma Teams have been shown to optimise patient care by reducing time to diagnostics and interventions. This document defines the 'Trauma Team' as a multidisciplinary team acting as the first responders to the trauma patient as they arrive at the hospital. This document seeks to provide guidance on the composition of trauma teams so that there can be a standardised Trauma Team across the entire trauma system which aligns with the guidance provided in the European Trauma Course (ETC).

Within the Trauma System, is it expected that for any patient in whom major trauma is suspected, a standardised Trauma Team response will be mounted. Major trauma is suspected when patients are deemed positive by the TTT. Therefore, every trauma patient should have the TTT applied to them, with all of those patients who are TTT positive being immediately received by a Trauma Team as described below. Ideally, the TTT should be applied in the pre-hospital environment but it can be also used as part of the immediate triage in an Emergency Department.

1.2. Purpose of this Paper

This document details the proposed composition of a Trauma Team in the new Trauma System, which has been developed in line with key recommendations specific to Major Trauma Centres (MTCs) Trauma Units and Trauma Training and Education from the National Trauma Strategy; it is specific to the 'Reception and Intervention' stage of the trauma patient pathway, as detailed in the National Trauma Strategy.

The aim of this document is to deliver a comprehensive and standardised definition of the Trauma Team across all hospitals, in the process supporting the individuals and teams involved in the

management of trauma patients to deliver world-class patient-centred care, leading to measurable benefits in terms of patient safety, quality of care and better patient outcomes.

2. Trauma Reception Team

2.1 The Planned Future State

The Trauma System will utilise the TTT to determine whether to bypass a Local Emergency Hospital in order to bring the patient directly to an MTC or Trauma Unit, depending on proximity. It is acknowledged, however, that severely injured patients may self-present or be brought by friends or family to a Local Emergency Hospital and so plans need to be in place for life-saving interventions and expedited transfer from these facilities. In acute hospitals, the aim is that all potential major trauma patients will be identified by the TTT and will be received by a Trauma Team which should be led by a consultant or experienced credentialed registrar or Specialist Registrar (SpR) with training in trauma team leadership out-of-hours. A positive TTT can also act as a trigger for 'pre-registration' of the trauma patient as one of the initial actions in standing up the trauma team at the receiving hospital, and also to ensure a more efficient flow of operations; particularly with regard to imaging and the management of blood products.

The Trauma Team should include 'Core' and 'Ancillary' Team members (see Section 2.2 below for more information) and may include nurses and other Trauma Support Practitioners (TSPs - see definition under Section 2.2.2). Activation of the appropriate Trauma Team will be centred around clinical information based on physiology, injuries, mechanism of injury and other set criteria.

One of the main advantages of the approach outlined below is that it will be possible to train and accredit staff utilising recognised courses such as Advanced Trauma Lift Support (ATLS), ETC or equivalent; it will also be possible to develop locally delivered, nationally standardised training based on this approach (see Section 3.1 for more details on training and education). When the Trauma System is fully implemented, the Trauma Team will be standardised at all hospitals who might receive a trauma patient, and Trauma Team members will be trained to provide a coordinated approach to trauma patient management.

2.2. Trauma Team - Definition & Membership

The Trauma Team includes the formation of a Core Trauma Team - to which this document largely refers to - and an Ancillary Trauma Team, whose presence and roles differ based on each hospital's capabilities (i.e. the resources available at the time of patient presentation to the relevant facility) and the patient's clinical presentation.

The Core Trauma Team will be responsible for the coordinated assessment and resuscitation of a patient, performing initial diagnostic tests and determining required consultation and transfer. The size and capability of the Ancillary Trauma Team is entirely scalable from being minimal in a smaller trauma-receiving hospital where major trauma patients would be expected to be

transferred to another facility, to all-encompassing in an MTC. In larger hospitals with specialised resources such as the MTCs and the TUSS, specific Ancillary Trauma Teams might be activated in certain circumstances; the availability of these special teams is likely to differentiate the MTCs and the TUSS from other trauma-receiving hospitals. Some larger units may have a differentiated Emergency Department Trauma Team (EDTT) and a Hospital Trauma Team (HTT) - see Section 2.3 for further information on these differences.

2.2.1 Membership

Fig 1. Trauma Team Organisation.

The Trauma Team's composition is flexible and can evolve depending on the clinical scenario and the availability of potential Core Trauma Team members. Using a common structure and crew resource management principles, it can make relevant transitions seamless.

The basic composition and structure of the Core Trauma Team is proposed to comprise the following:

- Trauma Team Leader (TTL)
- A "Airway" clinician and Airway nurse or Airway TSP
- B "Breathing" clinician
- C "Circulation" clinician and Circulation nurse or Circulation TSP
- Nursing staff, of appropriate seniority and experience
- Dedicated radiographer

- Scribe
- *Trauma Support Practitioner (TSP) - future state*

In the described structure, clinicians will be assigned to roles A, B or C based on their competencies by the TTL. Some larger units have experienced senior nursing support to the Trauma Team and TTL in the resuscitation room; this nurse may be involved in designation of nursing roles in collaboration with the TTL and ensuring support for more junior nurses in the Trauma Team. An Advanced Nurse Practitioner (ANP) is by definition an autonomous senior clinical decision-maker and may develop the skillset required to be designated as a member or lead of a Trauma Team. Similarly, a senior nurse could take up the role of a scribe, as a direct assistant to the TTL and Trauma Team.

The following section defines each member within the Trauma Team and outlines roles and responsibilities.

2.2.2 Trauma Team Member Role Descriptions

TTL:

There should be a defined and recognisable TTL to coordinate the management of the Trauma Team response:

- The TTL should be the consultant on-call covering major trauma reception and resuscitation (or experienced, credentialed registrar until the consultant arrives if out of hours). This is dependent on appropriate consultant staffing numbers to provide 24/7 TTL coverage.
- The TTL coordinates the Trauma Team structure and interaction.
- The TTL is required to have medical expertise and experience in the management of injured patients and coordinating teams.
- The TTL will delegate roles and the performance of procedures based on the skills and competencies available; early de-escalation by the TTL can free up resources, such as medical and nursing, when not required.
- Apart from the situation where an interim TTL is in place until the arrival of a consultant, it is desirable that the TTL should not change. However, should the need arise, for example, to provide procedural support or to cognitively offload, an alternative TTL must be allocated and the handover of role should be explicitly communicated.
- There may be a situation where the TTL in the ED hands over responsibility for the patient's management to an inpatient / ICU / operating team leader as determined by the patient's disposition, but the mechanism for this must be clearly defined at each hospital site.
- The TTL should de-escalate or stand down members of the Trauma Team when they are

not needed.

A - Airway doctor:

- The airway doctor is usually a critical care senior clinical decision-maker (encompasses consultant, registrar, ANP) from Anaesthesiology, Intensive Care, or Emergency Medicine with appropriate difficult / trauma airway skills.
- It is appropriate for the Emergency Medicine doctor to hand over this role to anaesthesiology, freeing the Emergency Medicine doctor to perform time-critical procedures - eFAST, chest drain, central / arterial access, splintage etc. - when needed. Similarly, situations may arise where incrementally more senior airway specialists are required.
- The airway doctor is responsible for assessing, managing, and securing the airway. A trauma airway is, by definition, a difficult airway, requiring the most senior critical care doctor available.
- The airway doctor may also address analgesia requirements and would assess 'disability', i.e. Glasgow Coma Scale (GCS), as part of the airway assessment, as well as an awareness of spine immobilisation requirements.

B - Breathing doctor:

- This role can be undertaken by a range of clinicians who have appropriate training. This may include Emergency Medicine, General Surgery or Orthopaedic consultants or registrars. It is anticipated that the Anaesthesiology consultant or registrar will be managing the airway and will not be available for the 'B' role.
- The breathing doctor is responsible for assessing and identifying necessary interventions. In particular, they will be expected to assess air entry bilaterally and may be required to decompress the chest and insert a chest drain.
- Depending on the clinical scenario, the clinicians' competencies and, under the direction of the TTL or an Ancillary Trauma Team specialist, other life-saving procedures may be required.
- The breathing doctor may also be able to assess the chest with eFAST[1] and would be expected to assist other clinicians if clinical load allows.

[1] *eFast may be performed by the 'B' or 'C' doctor based on their sonographic skills and other tasks required of them in their role as 'B' or 'C' doctor.

C - Circulation doctor:

- The circulation doctor role may be filled by any senior clinical decision-maker depending on skill sets and the need for other time-critical tasks and procedures to be performed in parallel.
- The circulation doctor is responsible for assessing the adequacy of the circulation and needs to be able to establish access to enable resuscitation. This may free the circulation nurse or TSP for their roles in establishing monitoring, sourcing equipment and medication preparation. The circulation doctor should be able to recognise the presence of shock and assess and intervene as appropriate - including stopping bleeding and activating appropriate blood and fluid resuscitation.
- The circulation doctor should make appropriate surgical referral where required e.g. as determined by resource availability and nature of injury.

Nursing:

- A minimum of three appropriately skilled nurses should be available to assist the Trauma Team. This may be de-escalated if, after primary survey, it becomes apparent that this is a greater resource than required.
- Nursing staff may also be able to assist any of the other members of the Trauma Team, including, with appropriate training or expertise, the A, B or C clinician, depending on the clinical situation and resource availability, e.g. if an airway is needed, assisting with chest drain insertion, etc.
- There may be times when a particular specialist nursing need is anticipated, and this should be prepared for in advance through planning and simulation e.g. obstetric trauma. If an emergency surgical procedure is indicated, theatre nurses might be required to attend. Similarly, dedicated Interventional Radiology (IR) nurses might be required as increasingly, IR is involved in haemorrhage control and is a vital part of the Trauma Team.
- Nursing staff, or where available, TSPs, laboratory specialists and haematologists, will be required for activation and management of major transfusion protocols.
- A single point of contact within the Trauma Team is needed to liaise with the transfusion laboratory. This can be fulfilled by a clinician, nurse, TSP or scribe.
- Nursing staff would also have an overview of the patient's wellbeing i.e., being aware of environmental temperature control and appropriate exposure and patient protection measures, as well as an important role in communicating and liaising with patients' family members

Radiographer:

- Should be available immediately for the Trauma Team to perform urgent X-Ray evaluations, and to liaise with the radiology department where more advanced modalities are required, i.e. CT or IR.
- A minimum of one radiographer is required for the Trauma Team. Additional radiographers will be necessary if more advanced imaging is required and should be activated early to ensure the MTA 1-hour KPI for time to CT in patients with traumatic brain injury is met.

Scribe:

- The Scribe is expected to be appropriately trained in major trauma and acts as a support for the TTL in terms of capturing relevant information with an ability to be assertive and provide leadership when required. The Scribe is expected to use standardised communication methods, e.g. TraumaDoc, to fulfil their role.
- The Scribe should be a senior nurse or a TSP and has a vital role in supporting cognitive offload and prompting actions to support the TTL and Trauma Team.

Trauma Support Practitioner:

- A TSP is proposed to be a healthcare professional with training or experience in the management of trauma patients, e.g. Health Care Assistant (HCA), paramedic, or Health and Social Care Professional (HSCP). However, as this role is still in development in the Irish healthcare setting, a clear and developed plan for its implementation and integration into existing trauma teams will be provided in future updates to this document.

Special Teams / Bespoke Ancillary Trauma Team:

In certain larger trauma-receiving hospitals, specialised resources might be 'activated' in certain circumstances. These include, for example, teams for Traumatic Brain Injury (TBI), massive haemorrhage, Paediatrics, Maternity, Older Adults, etc. The availability of these special teams is likely to differentiate MTCs and the TUSS from other trauma-receiving hospitals. These will be specific Ancillary Trauma Teams available to support the Core Trauma Team.

2.2.3 Trauma Team Membership based on Available Staff, Skills, and Clinical Scenarios

As described, the Trauma Team structure can be augmented based on a particular skill set needed, clinical scenarios and availability of team members.

An Emergency Department Trauma Team (EDTT) may be staffed by Emergency Department (ED) personnel in all roles where the patient's injuries and requirements can be managed within the skillset and resources of the EDTT. However, a patient may require more clinical resources where predicted, based on the pre-hospital pre-alert information or updated clinical information on arrival. In such a scenario, a Hospital Trauma Team (HTT) response involving Anaesthesiology / ICU, General Surgery, Trauma and Orthopaedic surgery and other senior clinical decision-makers, as appropriate, should be called.

2.2.4 Membership for Certain Clinical Scenarios:

- **Code black:** If TBI is suspected, a dedicated neurosurgical response and presence may be required. In sites without on-site neurosurgical services, urgent discussion should occur via the dedicated 1800-TRAUMA inter-hospital transfer referral service with either the National Neurosurgical Centre (NNC) at Beaumont Hospital or the neurosurgical service in CUH regarding patients who have sustained a TBI[2].

- **Code red:** Where significant haemorrhage is anticipated, it might be necessary to alert a range of services, e.g. CT, IR, blood bank, General, Vascular, Cardiothoracic Surgery, Theatre etc. In cases of penetrating trauma with shock, it may be appropriate to have Vascular, Cardiothoracic and / or Resuscitative surgeons available on reception to facilitate a fast-track decision to the operating theatre.

- **eFAST**: A core skill in Emergency Medicine and may be performed by the breathing or circulation clinician, or a member of the Ancillary Trauma Team, depending on role and task allocation by the TTL.

- **Massive transfusion protocol:** Where initiated, a single point of contact between the Trauma Team and the laboratory is required. It may be that the circulation clinician and circulation nurse can provide for this if their initial roles of assessment, taking blood and establishing large bore access has been completed. Alternatively, the TTL will identify resources that can be dedicated to the role of ensuring safe massive transfusion, being the single point of contact for the laboratory, and providing feedback to the TTL.

- **Maternity:** Where there is trauma to a pregnant woman, the presence of obstetric expertise +/- neonatal medicine may be required.

- **Older adults:** With the increased incidence of major trauma in older adults and the potential for multiple and complex medical comorbidities, it might be necessary to access specialist gerontology care as part of the Ancillary Trauma Team (there is more detail on this in the HSE *Clinical Guidance Document*: *Management of Major Trauma in Older Adults*).

- **Paediatrics:** When a child is involved, the Trauma Team might require input from a consultant / or experienced registrar in Paediatric Emergency Medicine (PEM), paediatric surgery, medical social work, and child protection / liaison.

2.3. Emergency Department Trauma Team vs Hospital Trauma Team

Note: Smaller units might not have a differentiated EDTT and HTT so the makeup of the Trauma Team could be an amalgam of the below.

[2] The dedicated 1800-TRAUMA referral service is coordinated by the National Ambulance Service (NAS) National Emergency Operations Centre (NEOC).

2.3.1 EDTT

An MTC / Trauma Unit might have an EDTT that is comprised of:

- A TTL who is the most senior doctor in the ED, i.e. consultant during the extended working day and experienced credentialed registrar or SpR at night.
- Team members who are the Non-Consultant Hospital Doctors (NCHDs) and / or nursing staff in the ED designated to 'A', 'B', 'C' roles as per skills / training:
- Nurses who are available to the resuscitation area, including a scribe.
- HCA and / or porter allocated to the ED at that time.
- The radiographer who is allocated to the ED at that time.

2.3.2. HTT

An MTC / Trauma Unit should have a HTT that is composed of senior clinical decision-makers, e.g. Anaesthesiology, surgical, orthopaedic consultant / registrar-grade decision-makers. This acknowledges the fact that these patients are likely to require time-critical decisions and management beyond the ED, so early activation and integration is required.

An MTC / Trauma Unit should have an HTT that is comprised of:

- A TTL who is the consultant on-call covering major trauma reception and resuscitation.
- An airway clinician (the anaesthesiologist who is on-call 'in-house' would assume the airway doctor role in a HTT response)
- A breathing clinician
- A circulation clinician
- Splint application and joint reduction may be performed by the Emergency Medicine or orthopaedic registrar, depending on role and task allocation by the TTL.
- If a patient needs to be fast-tracked to the operating theatre to stop bleeding, it is expected that the general surgery doctor would expedite this pathway operationally.
- Appropriately skilled nursing staff in sufficient numbers e.g., where a massive transfusion is required, the skillset and number of nurses required increases.
- HCA
- Dedicated Porter.
- Radiographer on-call to ED.

3. Next Steps

3.1. Links to Training and Education

There is a need for individuals and teams involved in the provision of trauma care across all stages of the care pathway, from pre-hospital care and retrieval to rehabilitation, to be trained specifically in the core competencies that make up a Trauma Team. Therefore, medical, nursing, HSCPs, pre-hospital and other support staff working in these Trauma Teams require standardised training and support to ensure they are equipped to manage trauma patients safely, effectively, and consistently across the Trauma System. The National Trauma Training Framework, currently in development by the National Office for Trauma Services, will act as a guide for all trauma-receiving hospitals on the core competencies and associated training required for staff to effectively deliver trauma care.

It is important to acknowledge that trauma care involves several disciplines, various kinds of expertise and several medical specialties, each with their own specialty training curriculum and ongoing Continuous Professional Development (CPD) needs. Training should include communication, teamwork, human factors training, and other non-technical skills training. Such training requirements are constantly changing in line with evidence-based practice and are guided by a combination of individual, hospital-specific, and discipline-specific CPD requirements.

3.1.1 ETC and ATLS Certification

Advanced Trauma Life Support (ATLS) certification is a minimum standard that will be expected of medical Trauma Team members at MTCs, Trauma Units and Local Emergency Hospitals (some members may have completed ETC).

TTLs should be ETC-certified. However, increased course availability will be required and will be addressed through the rolling out of the National Trauma Training Framework. It will be the responsibility of the National Office for Trauma Services (NOTS), in conjunction with the MTCs for their respective Trauma Networks, to oversee sufficient courses to achieve this aim. It is intended that a cohort of ETC instructors is created for Ireland. It is key that more ATLS instructors are developed from trauma-facing specialties. Increasing availability on ATLS courses for doctors who could potentially be required to treat should be a twin goal of the trauma system, alongside expansion of ETC.

There is also an opportunity to develop additional, shorter, locally based training for Trauma Team membership. A locally deliverable and standardised training course, currently in advanced stages of development, will be delivered to staff who might be expected to perform as trauma team members. This training can be delivered to coincide with expected staff turnover. It is based on ETC and ATLS syllabi, offering foundation skills in both, as well as National Trauma Team standards, and provides the basis for trauma team membership, structure and organisation.

3.1.2 Nursing training

Notwithstanding the importance of experiential-based nursing excellence, increased access to trauma training is fundamental to supporting and improving the nursing contribution to the Trauma Team. Availability needs to be made in Ireland for delivery of the Advanced Trauma Nursing Course (ATNC), which is a sister course to ATLS. Increased capacity is also required on the Trauma Nursing Core Course (TNCC).

Appropriate levels of nursing training need to be determined and includes provision of Trauma Nursing Core Course (TNCC). Observer opportunities are available on ATLS and ETC courses, as well as ETC training for nursing staff and TSPs.

3.2. Training & Education Funding

At present, there is no funding within the Trauma Programme specifically identified for the provision of training and education specific to the upskilling of Trauma Team members.

Depending on future funding for the provision of training becoming available to the Trauma Programme, the National Office for Trauma Services will aim to support the delivery of standardised training courses that are defined within this document**.**

ETC and ATLS-type courses will continue to be delivered under their current basis, remunerated through study / Continued Medical Education (CME) grants.

3.3 Document Revision - Timeframes and Scope

The information as outlined in this document can be applied to all trauma-receiving hospitals. The policy will be reviewed after 6-12 months from Q4 2024 (the date of its approval by the Trauma Programme Steering Group). As the Trauma System incrementally develops and the Regional Health Areas are progressed, the document will be revised to include further guidance on key items such as the development of pre-registration processes, roadmaps on implementation and integration of proposed core trauma team roles such as the TSP, and updated guidance on training and education recommendations for each member of the Trauma Team.

4. Conclusion

Poly-traumatised patients present unique and immediate challenges in terms of their initial clinical presentation, often requiring expedited access to a variety of clinical specialties and vital interventions. Trauma Teams ensure that a patient who is Trauma Triage Tool positive (see Appendix A1.) is received by an appropriately skilled and co-ordinated level of clinical response, to ensure those vital interventions happen in a coordinated, safe, and timely manner, resulting in a better outcome for the patient.

This document defines the Trauma Team and outlines the roles and responsibilities of each member. It aims to act as a guide, in conjunction with the National Trauma Training Framework,

for each individual trauma-receiving hospital across the Trauma System, on how to ensure that its staff is appropriately organised and trained in the core competencies required to effectively deliver trauma care. This described model of a Trauma Team is understandable, trainable for, accreditable, deliverable, and interchangeable across trauma-receiving hospitals in Ireland.

Appendix

A1. Trauma Triage Tool[3]

All patients attended to prehospital as the result of an injury, should have the Trauma Triage Tool applied. Pre-hospital, a patient who meets <u>any</u> of the criteria of the Trauma Triage Tool is considered a Major Trauma +ve Patient.

Traumatic event
+ any <u>single</u> criteria from Injuries, Physiology or Mechanism
= Major Trauma +ve Patient

A. Injuries Identified:

Injuries:	
Airway	▪ Airway injury or potential airway injury ▪ Hoarseness or stridor
Chest	▪ Evidence of respiratory compromise ▪ Cyanosis, crepitus, subcutaneous emphysema ▪ Suspicion of multiple rib fractures, severe pain, ▪ Seatbelt abrasion, contusion, evidence of blunt impact ▪ Significant chest wall trauma (e.g. deformity, flail chest)
Haemorrhage	▪ Severe haemorrhage or suspected severe haemorrhage ▪ Arterial bleeding requiring tourniquet control
Head	▪ Any Canadian head CT positive patients ▪ Open/depressed skull fracture
Limbs	▪ Fracture to 2 or more of: femur, tibia, humerus. ▪ Major compound fracture or open dislocation. ▪ Crushed, degloved, mangled, pulseless limbs ▪ Amputation above wrist or ankle ▪ *Plastics may be suitable for some TUs?
Penetrating	▪ All penetrating injuries except isolated superficial limb injuries
Abdomen	▪ Severe pain, rigidity, distension, swelling ▪ Seatbelt abrasion, contusion, evidence of blunt impact.
Pelvis	▪ Suspected major pelvic fractures (i.e. active bleeding is suspected from a pelvic fracture following blunt high-energy trauma)
Spine	▪ Spinal trauma suggested by new, abnormal neurology. ▪ Visible deformity, priapism, severe pain.
Burns	▪ >20% BSA ▪ Suspected respiratory tract burns

These are not exclusive or absolute. Any significant injuries involving more than one body region, or which require specialist care or treatment to preserve life, limb or quality of life should be considered for triage to MTC. **If there is concern on the part of the treating clinicians pre hospital, the case should be discussed with the NEOC Trauma Desk**.

[3] Note that most Trauma Units do not have an on-site plastic surgery service.

B: Patient Physiology:

Physiology:	
SpO2:	< 90% on air
Respiratory Rate:	< 10 or > 29
Heart Rate:	> 120bpm after adequate analgesia
Systolic Blood Pressure:	< 90mmHg at any stage
Glasgow Coma Score:	< 13 or deteriorating

These are not exclusive. **If there is concern on the part of the treating clinicians pre hospital, the case should be discussed with the NEOC Trauma Desk.**

C: Mechanism of Injury:

Mechanism:	
Fall	▪ >3metres (or 2 x patient's own height) ▪ Fall off ladder > 1metre
Large animal incident	▪ Collision, fall, trampled
RTC	▪ Death in same vehicle ▪ Ejection (partial or complete) from vehicle ▪ Significant intrusion ▪ Intrusion with compression ▪ Damage to A post of vehicle ▪ Prolonged extrication time (> 30 minutes) ▪ Motorcycle > 30kph ▪ Cyclist > 30kph ▪ Any pedestrian vs vehicle ▪ Bullseye windscreen ▪ High speed RTC (> 60kph)
Electrocution	▪ High voltage electrocution
Burns	▪ Isolated burns may be considered for triage direct to burns unit
Other	▪ Any rapid deceleration incident ▪ Available information consistent with high risk of injury ▪ Focal blunt trauma to head or torso ▪ Hanging

Mechanism is recognised as being an important, but sometimes not specific, tool for prediction of major trauma. **Any decisions to designate (or not) a patient as Major Trauma, based on mechanism alone, should be discussed with the NEOC Trauma Desk.**

A2. Trauma Team Role Cards

Trauma Team Role Cards provide more detail on the roles and responsibilities of each of the Trauma Team members and can be created and utilised as required until Trauma Team systems and processes are well established and normalised. They are designed to consider the possible roles and specific actions which may need to be carried out for patients who have experienced major trauma. They are not intended to be prescriptive for the specific team members that must be present or to limit the scope of practice of those team members. Below are examples of some of the Core Trauma Team Ancillary Trauma Team members.

1. Core Trauma Team

Individual trauma-receiving hospitals can develop role cards for Core Trauma Team members. Example of role cards created for the airway, breathing, and circulation clinician roles can be seen here:

Airway Doctor:	
Prior to Arrival	**On Arrival**
• ROLE STICKER (front & back) & PPE • Identify and work with Airway nurse • Formulates and clearly states airway plan with airway nurse and team leader • With Airway nurse, utilises RSI checklist to prepare equipment and drugs • Prepare equipment for transfer	• Controls and commands safe transfer of patient to resus trolley • Responsible for assessing and managing the airway & ventilation • Assess GCS with airway nurse • Ensures C-spine precautions & controls the log roll • Assesses need for intervention / intubation and communicates this with TTL • Liaise with TTL re choice of anaesthetic drugs and analgesia • Confirms ventilation parameters • Monitors neurological status • Insert orogastric tube / nasogastric tube • Ensures appropriate on-going sedation • Accompanies patient on transfer, takes equipment & drugs

Breathing Doctor:	
Prior to Arrival	**On Arrival**
• ROLE STICKER (front & back) & PPE	• Examine the chest; inspects and palpates the

• Identify and work with breathing nurse • Prepares equipment - thoracostomy kit, chest drain etc. as required • Locates Ultrasound Machine for eFAST • Special circumstances – prepare for Thoracotomy, pericardial decompression and inform relevant specialties (Cardiothoracics) as directed by TTL	neck • Assess breathing pattern – RR, adequacy • Assist with SpO2 and ECG monitoring • Perform lateral thoracostomy and chest drain insertion as directed by TTL • Perform eFAST if trained • Perform the secondary survey & AMPLE History as directed by TTL

Circulation Doctor:	
Prior to Arrival	**On Arrival**
• ROLE STICKER (front & back) & PPE • Identify and work with Circulation Nurse • Activate Trauma team EDTT / HTT as directed by TTL • Coordinate telephone communications, including specialist teams • Prepares IV access equipment and / or IO kit • Prepares for catastrophic external haemorrhage: Tourniquet, haemostatic dressing, splints, pelvic binder etc. • Special circumstances – prepare for resuscitative hysterotomy and inform relevant specialties (Obstetrics, Neonatology) as directed by TTL.	• Control external haemorrhage • Continue primary survey assess CRT, HR, and BP • Assess the abdomen and perform eFAST as directed by TTL • Establish size and function of pre-existing IV lines. Ensure two large bore IV cannulas • Take bloods incl. Group & Crossmatch • Complete and sign forms • Consider invasive haemodynamic lines • Order diagnostics as requested by TTL • Splint/pelvic binder application, reduction of fractures

2. Nursing

Role cards can also be created by individual trauma-receiving hospitals for other Core Trauma Team members with additional responsibilities defined, such as the below cards developed for nursing:

Airway Nurse:	
Prior to Arrival	**On Arrival**
• ROLE STICKER (front & back) & PPE • Completes equipment checks, locate difficult airway trolley • Clarifies airway plan with Airway Doctor & TTL	• Ensures cervical spine immobilisation • Perform rapid neurological assessment (GCS, pupil size & response) • Ensure oxygenation (15 litres / NRB)

• Check suction available & working (both wall & transport) • Set up ETCO2 • Prepares ventilator • Prepares for intubation as per RSI checklist • Clarifies medications for RSI with Airway Doctor & TTL • Transport Bag ready	• Assists with intubation and airway management as required and secures the ET tube • Manages ventilator with Airway Doctor • Assists with / inserts nasogastric or orogastric tube • Performs eye care • Accompanies the intubated patient during transfer with appropriate airway equipment for transfer

Breathing Nurse:	
Prior to Arrival	**On Arrival**
• ROLE STICKER (front & back) & PPE • Identify and work with breathing doctor • Prepare monitors • Prepare chest drain trolley • Special circumstances - locate thoracotomy kit, pericardial decompression kit as directed by TTL.	• Apply monitors when patient arrives • Perform an ECG if indicated • Assist with removal of clothing • Assist with chest procedures e.g. thoracostomy, chest drain insertion

Circulation Nurse:	
Prior to Arrival	**On Arrival**
• ROLE STICKER (front & back) & PPE • Identify & work with the Circulation doctor • Ensure monitoring equipment prepared • Prepare Fluid warmer • Prepares external warming device • Blood bank on standby, as applicable	• Attach monitoring, assess & continuous monitoring of circulatory status • External bleeding control (apply direct pressure) • Reminds team of Group & Crossmatch sample pre-transfusion • IV lines & attach warm IV fluids • Draw up non-anaesthetic drugs (analgesia, antibiotics, Tetanus) • Relay fluid input / output volumes to Scribe • Bair hugger / blankets • Assists with MTP / rapid infuser

3. Ancillary Trauma Team

Individual hospitals can also develop role cards for additional Ancillary Trauma Team members based on need and resource availability. An example role card for the Porter Ancillary Trauma Team member can be seen below:

Porter:	
Prior to Arrival • ROLE STICKER (front & back) & PPE • Oxygen with ventilator attachment • Spare oxygen cylinder for transfer • Blood bank if required • Ensure Transport bag & portable suction ready	**On Arrival** • Obtain blood products from blood bank if required • Liaise with MTP team • Inform CT when ready to leave resus • Gathers transport bag & portable suction • Ensures blood bank aware if stood down in consultation with TTL • Return unused blood products to blood bank

A3. Trauma Team Operational Structure

Trauma Team Operational structures can also be created by individual trauma-receiving hospitals and / or TTL / Trauma Teams with additional responsibilities defined, such as the below cards developed for Trauma Team Leader:

Trauma Team Leader Checklist:			
• Sign into Trauma team book • Traumadoc • Notify Senior EM Doctor/TTL • Trauma Team Activation • Role allocation • Task allocation • Pre-Brief *What do we know?* *What do we expect?* *What do we need to prepare for?* *Treatment priorities?* • Resuscitative surgical procedures likely – 'Thoracotomy / Hysterotomy' 'or need	• **Trauma Bay setup for shocked patient reception:** ○ PoCUS ○ Procedure trolley ○ Circulation trolley • **Massive transfusion likely** ○ Blood products ordered ○ Rapid infuser checked • **Lifesaving interventions:** ○ Pleural decompression ○ External haemorrhage control	• **Pre arrival time out:** ○ Expected injuries based on mechanism ○ Team priorities • **Revise lifesaving interventions / review aides memoire (e.g. WETFLAG)** • **Large bore IV access** • **RSI** ○ Analgesia, Sedation & paralytic ○ Maintenance	• Last set of vitals • Transfer the patient to ED trolley • MIST AMBO handover* • Monitoring applied* • History* ○ Anticoagulant /Antiplatelets ○ Significant medical history ○ NOK notified • Direct primary survey* • Rapid transfer to theatre or IR suite if indicated. • Order radiology series • Facilitate secondary survey

to go to theatre ASAP: Notify surgical specialties and Anaesthesiology. ● Paediatric trauma team members alerted.	○ Pelvic splinting ● **Resuscitative surgical procedures likely:** ○ Thoracotomy Kit ○ Hysterotomy Kit Specialties informed	drugs ● **Drugs** ○ TXA, Hypertonic saline, Calcium ● **Disposition** ○ CT +/- IR ○ OT / ICU / Ward ● **Transfer - Paediatric trauma** ● **Inform Eye / ENT in advance** ● **Debrief**	● Disposition *May occur simultaneously
● ***Summarises regularly and vocalises plan / next steps using '10-seconds-for-10- minutes principle'*** ● ***After Action Review/hot debrief*** ● ***Consider forensics***			