

**Trauma Triage Tool – Major Trauma Criteria (MIST)**

**MECHANISM OF INJURY (MOI)** – Triage by MOI alone has limited accuracy, however the “force of mechanism” still needs to be factored into clinical decision making for appreciation of potential underlying injuries.

**MOI + \*high risk groups = much stronger indicator for major trauma**

**\*High risk groups include:**

- Patients < 16 or ≥ 65 years
- Obstetric patients > 20 weeks gestation
- Patients on anticoagulants, antiplatelet medications or with clotting disorders
- Significant co-morbidities
- NESB / Difficult to assess

In the pre-hospital environment a major trauma patient is defined as a patient that meets **ANY** of the criteria of the Trauma Triage Tool.

**M— MECHANISM**
**Blunt**

Transport Incident	Other Incidents
-Death in same vehicle -Intrusion into occupant compartment > 30cm -Steering wheel deformity -Patient side impact -Cyclist/Motorcyclist (Fall or Collision) -Vehicle vs pedestrian -Ejection from vehicle (partial or complete) -Entrapment with compression	-Agricultural machinery or equipment / Quadbike -Livestock (e.g. horse/cattle) -Crush Injury (excluding fingers/toes) -Falls > 3m or paediatrics twice the child’s height -Falls off ladder > 1m -High voltage injury -Any rapid deceleration incident -Focal blunt trauma to head or torso (eg. implement / assault bike handlebars) -Hanging

**I— INJURIES**

**Penetrating** - All penetrating injury (excluding isolated injury to hands or feet) - e.g. Blast/Shooting/Stabbing/Impalement

**Head:** Head Injury with LOC or amnesic to events with ANY of the following:

- 2 or more vomits
- Seizure
- Pt on anticoagulants, antiplatelet medication or Hx clotting disorder
- Open, depressed skull # or signs of base of skull # (periorbital ecchymosis, CSF leak)

**The primary cause of a patient’s ↓ LOC is due to the traumatic injury until proven otherwise.**

**Alcohol consumption / drug use as the primary cause should only be considered once ALL OTHER CAUSES of ↓ LOC have been ruled out.**

**Face:** Injury with potential airway risk, severe haemorrhage

**Neck:** Swelling, severe bruising, hoarseness or stridor

**Chest:** Suspicion of multiple rib #'s, severe pain, restraint abrasion/contusion, evidence of blunt impact

**Abdomen:** Severe pain, rigidity, distension, swelling, restraint abrasion/contusion, evidence of blunt impact.

**Pelvis:** Pain, **including severe lower back pain**, (Does MOI suggest a potential #), deformity, significant abrasion/contusion.

**Limbs:** 2 or more proximal long bone #'s, degloving injury, ischaemia, amputation proximal to digits

**Spinal/Back:** Visible deformity, priapism, severe pain

**Burns:** Dermal or full thickness burns **Adults > 20%**, **Children > 10%**, or burns involving face, hands, feet, genitalia, perineum, anus and major joints or inhalation injury with cutaneous burns. All circumferential burns or burns in a patient with significant comorbidities or pregnant women in the 2nd/3rd trimester.

**Note:** For burns patients in the Sydney Metro area without multi-system trauma (i.e. no additional T1 criteria other than burns) refer to Protocol T12 Burns Patient Transportation Cascade.



**Trauma Triage Tool – Major Trauma Criteria (MIST) continued**
**S— SIGNS AND SYMPTOMS**
**Airway:** Potential injury / at risk, hoarseness, stridor

**Breathing:** RR < 10 or > 29, SpO<sub>2</sub> < 90% on air, cyanosis or respiratory difficulty, chest wall crepitus, subcutaneous emphysema

**Circulation:** HR > 120

 SBP < 100 **at anytime** or severe haemorrhage or suspected severe haemorrhage

**Disability:** GCS ≤ 13 or combined motor sensory deficit or any worsening trend in ABCD

**Paediatrics:**

Physiological changes are late indicators of serious injury in a child whom may lose 30% blood volume prior to ANY changes in vital signs. The following is a guide:

	1 <sup>st</sup> year	1-5 yrs	6-12 yrs
HR	> 160	> 140	> 120
SBP	< 60	< 70	< 80
RR	> 60	> 35	> 30

**T— TRANSPORT**

 If a patient meets Major Trauma Criteria paramedics are **authorised** to transport up to 60 minutes Metropolitan / 90 minutes Regional from scene in order to reach the appropriate destination (see transport destination algorithm for suitable destinations- this includes cross border)

**MANDATORY NOTIFICATION** by Paramedics via the Control Centre to the Aeromedical Control Centre (ACC) is required for direction on a suitable destination for patients unable to be transported directly to the appropriate destination indicated in the transport destination algorithm. Once a destination hospital has been determined in conjunction with the ACC Retrieval Consultant, Paramedics are to comply with the agreed destination. **Do not delay transport to hospital waiting for higher clinical skill level / Aeromedical team – rendezvous en-route.**

**Considerations for patients ≥ 65 years:**

- May have different physiological responses to trauma resulting in:
  - Vital signs that do not fit within the parameters listed above
  - Vital signs that don't reflect the severity of the injuries due to medications, hypertension Hx and co-morbidities
- Low impact mechanisms (e.g. ground level falls, low speed MVA's etc) may result in severe injury

**Transport destinations**

Major Trauma Service (Adult)		
John Hunter	Liverpool	Royal North Shore
Royal Prince Alfred	St George	St Vincent's
Westmead	Canberra (ACT)	<sup>#</sup> Gold Coast University (QLD)
Major Trauma Service (Paediatric)		
Sydney Children's (POW)	Children's Hospital Westmead	John Hunter Children's

<sup>#</sup> Where established local cross-border agreements exist.

Regional Trauma Services		
<sup>^</sup> Albury	Gosford	Nepean
Wollongong	Coffs Harbour	Lismore
Orange	Port Macquarie	Tamworth
Tweed Heads	Wagga Wagga	

<sup>^</sup>Where established local cross-border agreements exist.

Trauma Staging Hospitals			
Armidale	Broken Hill	Dubbo	Griffith
Manning Base	Shoalhaven	South East Regional (Bega)	



## Treatment:

Patient Care – A2

### T1 Assessment:

Assess the scene and provide reports and requests to the Control Centre:

- Initial situation report using **ETHANE**
  - Exact location
  - Type of incident
  - Hazards
  - Access to location
  - Number of casualties
  - Emergency services, required or present
- Provide Control Centre with SMART Tag™ patient triage colour when completion of a full MIST might be delayed

**RED**  
Priority 1

**YELLOW**  
Priority 2

**GREEN**  
Priority 3

**BLACK**  
Deceased

- Provide a **FULL MIST** report
  - Mechanism of injury
  - Injuries
  - Signs and symptoms
  - Treatment/transport
- Request for additional resources as required (higher clinical skill level/Aeromedical team etc)

Minimise time on scene where possible.

Remember: Patients with penetrating trauma and/or blunt trauma who are exsanguinating require early pre hospital notification from scene to the receiving hospital, extremely short scene times and treatment en-route because surgical intervention and major blood transfusion is often needed to control the bleeding and stabilize the patient

Treat per specific protocol/s

Trauma Code 3 notification to the receiving hospital



Urgent Transport – Refer to specific transport destination algorithm

Regularly repeat and document ABCD physical examinations and physiological observations in order to identify trends, clinical deterioration and/or response to treatment

**Documentation Requirements** - The correct documentation of Protocol 'T1' on a patient's clinical record, is essential to enable pre-hospital and in-hospital data linkage to track patient outcomes.

- Patients who are positive to T1 Trauma criteria – **Record T1P as the chief protocol**
- Patients assessed and are negative to T1 Trauma criteria – **Record T1** on the clinical record

Refer to Reference R39—Pre-Hospital Management of Major Trauma Principles for further information



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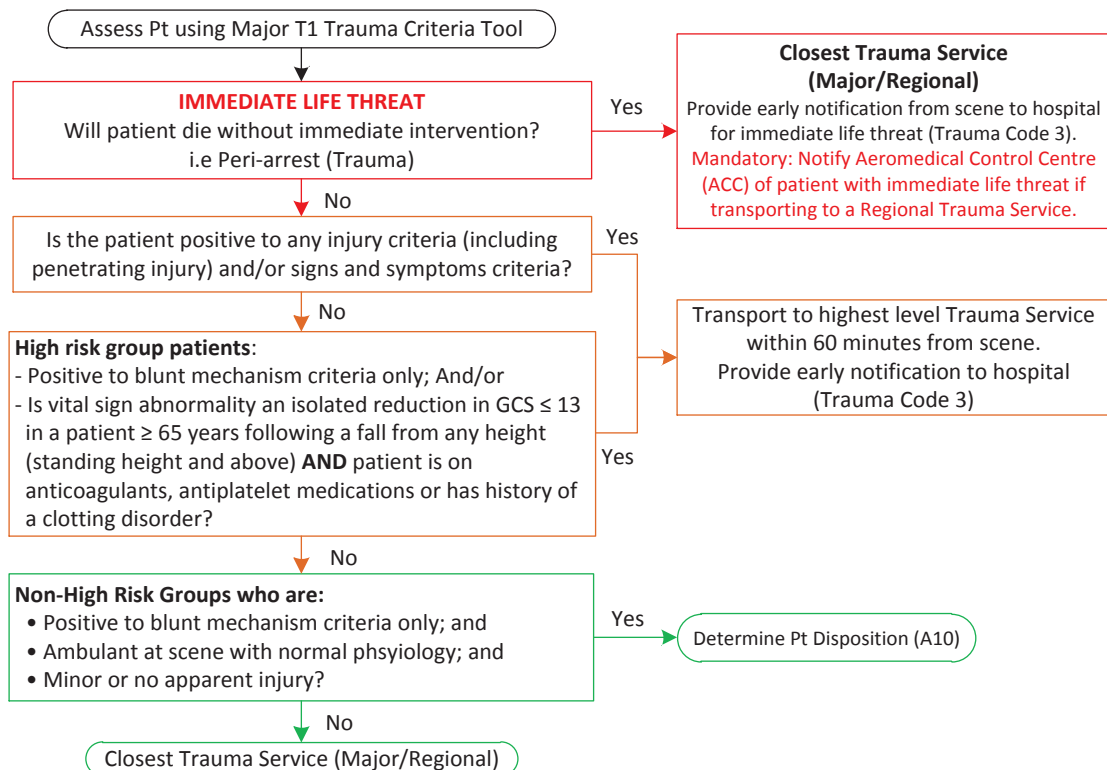
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2018 Protocol and Pharmacology

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## Major Trauma: Adult — Metropolitan Transport Algorithm



If no Trauma Service within 60 minutes from scene

**MANDATORY:** Request Control Centre notify ACC of major trauma patient requiring retrieval and seek direction on appropriate destination.

Do not delay transport waiting arrival of Aeromedical Team – update MIST reports with Control Centre & responding Aeromedical Team regarding any call-off, rendezvous point en-route.

## Major Trauma: Adult - Regional Transport Algorithm

Assess Pt using Major T1 Trauma Criteria Tool

### IMMEDIATE LIFE THREAT

Will patient die without immediate intervention?  
i.e. Peri-arrest (Trauma) and/or an exsanguinating patient requiring blood products

Yes

No

### Head Injury with a GCS ≤ 13?

(Includes an isolated reduction in GCS in a patient ≥ 65 years of age following a fall from any height (standing height and above) **AND** the patient is on anticoagulants, antiplatelet medications or has a history of clotting disorder?)

Yes

No

Is the patient positive to any injury criteria (including penetrating injury) and/or signs and symptoms criteria?

Yes

No

High risk group patient positive to blunt mechanism criteria only?

Yes

No

### Non-High Risk Groups who are:

- Positive to blunt mechanism criteria only; and
- Ambulant at scene with normal physiology; and
- Minor or no apparent injury?

Yes

Determine Pt Disposition (A10)

No

Closest Trauma Service (Major/Regional)



If no Trauma Service within 90 minutes from scene

**MANDATORY:** Request Control Centre notify ACC of major trauma patient requiring retrieval and seek direction on appropriate destination.

Do not delay transport waiting arrival of Aeromedical Team – update MIST reports with Control Centre & responding Aeromedical Team regarding any call-off, rendezvous point en-route.

### Hospital Destination Cascade

1. Trauma Service within 90 minutes from scene, if not then;
2. Trauma Staging Hospital within 90 minutes from scene, if not then;
3. Local Hospital

If unable to transport to a Trauma Service, request Control Centre notify ACC of major trauma patient and seek direction on appropriate destination.

## Major Trauma: Paediatric — Transport Algorithm

