

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 - <u>All</u> penetrating injury (excluding isolated injury to hands or feet) - e.g. Blast/Shooting/Stabbing/Impalement	
<p>Head: Head Injury with LOC or amnesic to events with ANY of the following:</p> <ul style="list-style-type: none"> • 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) <p>The primary cause of a patient’s ↓ LOC is due to the traumatic injury until proven otherwise.</p> <p>Alcohol consumption / drug use as the primary cause should only be considered once ALL OTHER CAUSES of ↓ LOC have been ruled out.</p> <p>Face: Injury with potential airway risk, severe haemorrhage</p> <p>Neck: Swelling, severe bruising, hoarseness or stridor</p> <p>Chest: Suspicion of multiple rib #'s, severe pain, restraint abrasion/contusion, evidence of blunt impact</p>	<p>Abdomen: Severe pain, rigidity, distension, swelling, restraint abrasion/contusion, evidence of blunt impact.</p> <p>Pelvis: Pain, including severe lower back pain, (Does MOI suggest a potential #), deformity, significant abrasion/contusion.</p> <p>Limbs: 2 or more proximal long bone #'s, degloving injury, ischaemia, amputation proximal to digits</p> <p>Spinal/Back: Visible deformity, priapism, severe pain</p> <p>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.</p> <p>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.</p>



Trauma Triage Tool – Major Trauma Criteria (MIST) continued

S— SIGNS AND SYMPTOMS

Airway: Potential injury / at risk, hoarseness, stridor
Breathing: RR < 10 or > 29, SpO₂ < 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 st 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)	#Gold Coast University (QLD)
Major Trauma Service (Paediatric)		
Sydney Children's (POW)	Children's Hospital Westmead	John Hunter Children's

Where established local cross-border agreements exist.

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

^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
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- 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

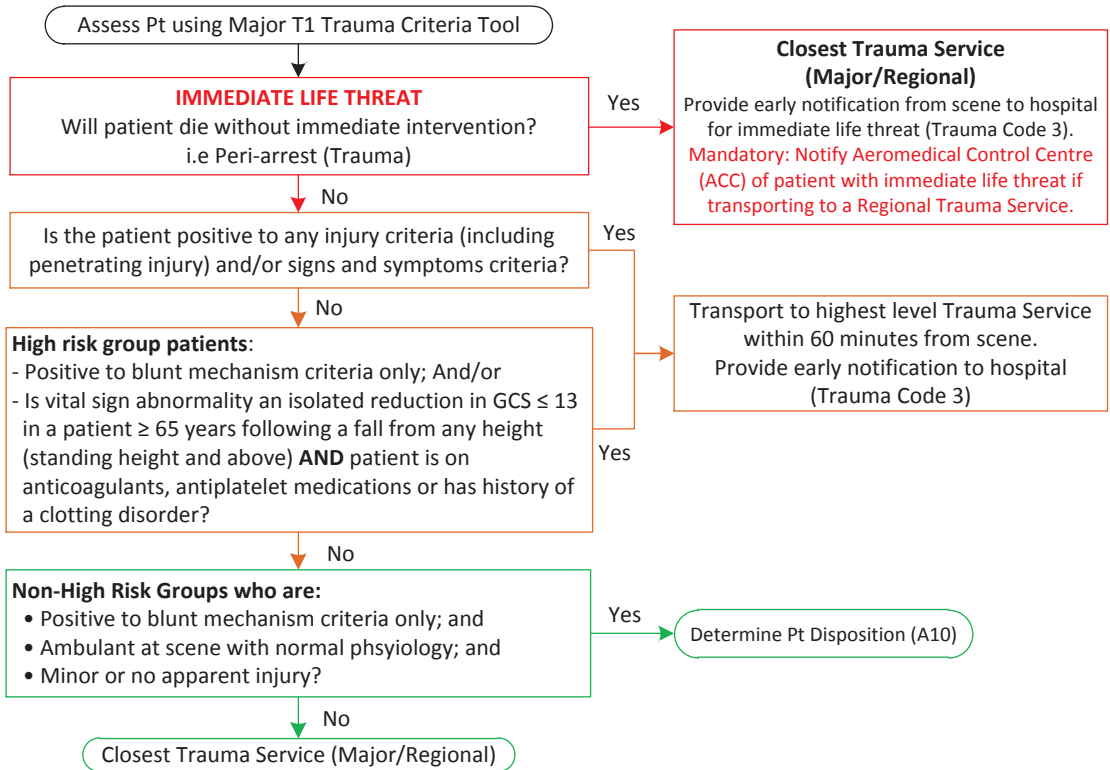
Documentation Requirements - The correct documentation of Protocol 'T1' on a patient's clinical record, is essential to enable pre-hospital and in-hospital data linkage to track patient outcomes.


- 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

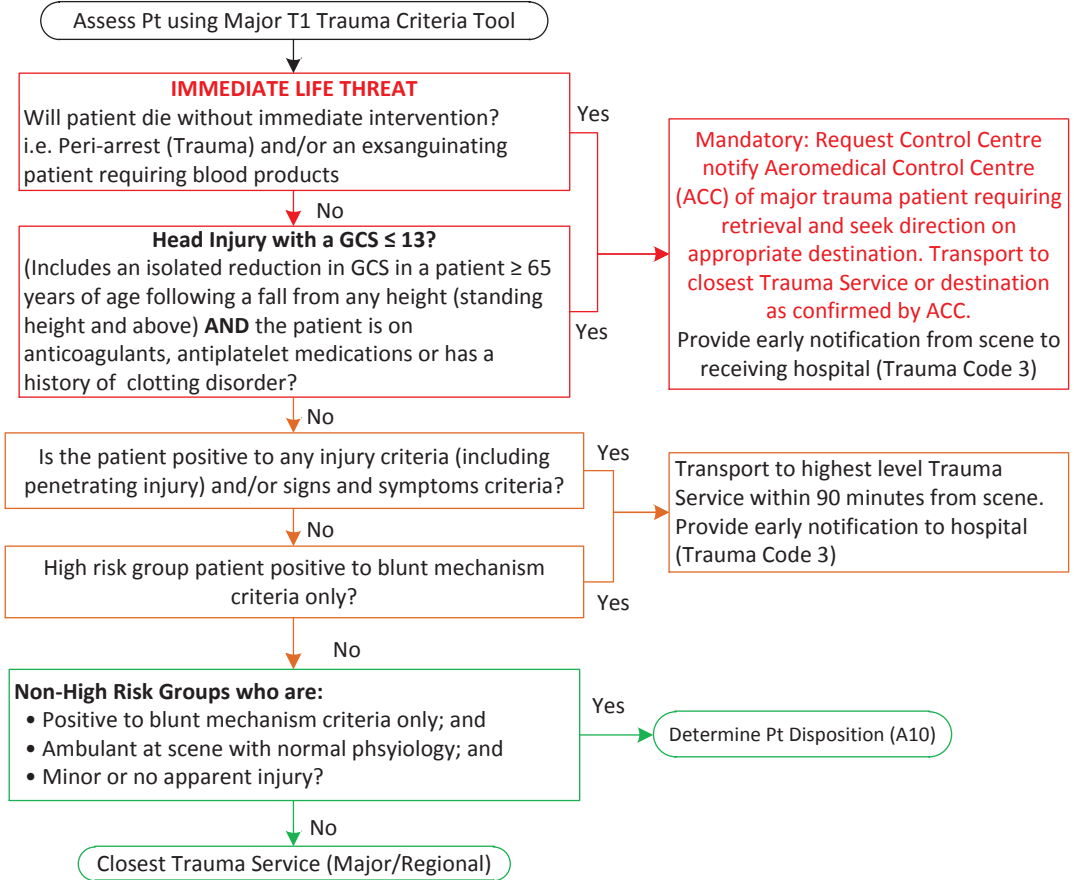



Major Trauma: Adult — Metropolitan Transport Algorithm



 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



 **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.

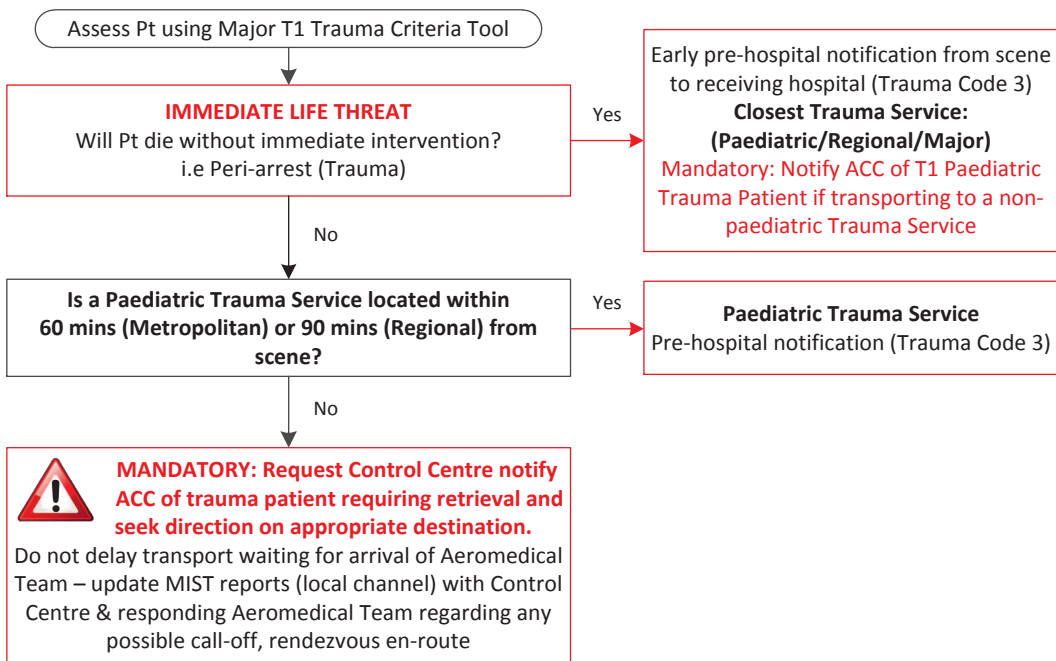
Hospital Destination Cascade

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



Paediatric Destination cascade if no Paediatric Trauma Service located within 60 mins (metro) or 90 mins (regional) from scene:

- Major Trauma Service, if not then
- Regional Trauma Service, if not then
- Trauma 'Staging' Hospital, if not then
- Local Hospital

ACC notification and direction on appropriate destination / rendezvous point remains mandatory and takes precedence.

