New Zealand Out-of-Hospital Major Trauma Triage Policy

This document is for the use of clinical personnel when triaging patients with trauma in the out-of-hospital setting in New Zealand. It has been developed by the National Trauma Network in conjunction with the Ambulance Sector.

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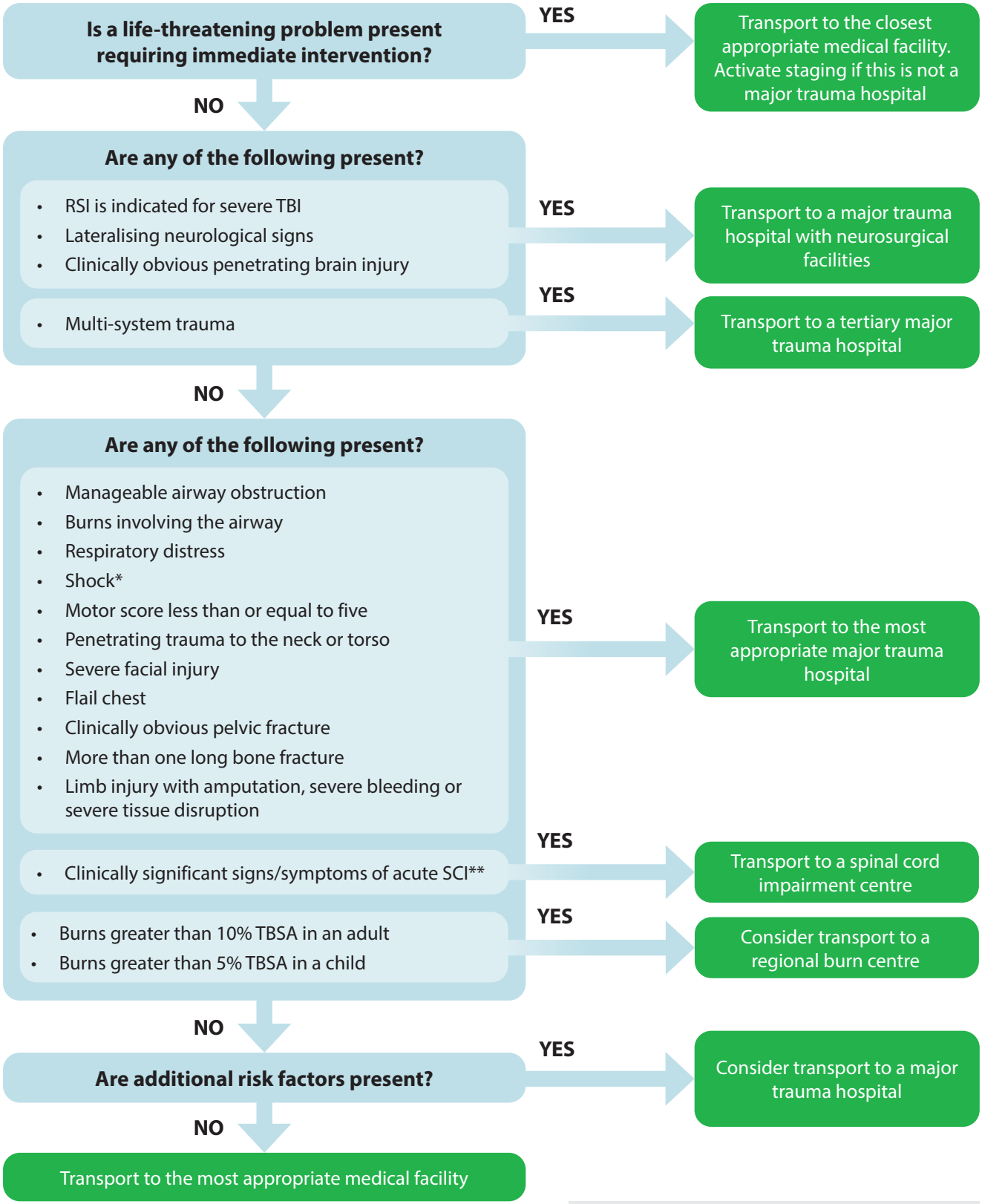
WELLINGTON
FREE AMBULANCE
kia ora te tangata

Major Trauma Triage Policy Flowchart



Note:
* Consider Critical Haemorrhage notification
** Refer to Spinal Cord Injury Destination Policy

Major Trauma Triage Policy: Additional Information

Introduction

The information within this policy complements the major trauma triage flowchart and should be read in conjunction with it. The major trauma triage flowchart is to be used by clinical personnel (for example ambulance and PRIME personnel) to identify which patients meet criteria for major trauma in the out-of-hospital setting. Patients who have been identified as having major trauma should be transported directly to the most appropriate major trauma hospital provided this is feasible and safe.

Major trauma hospitals are those hospitals designated by the Regional Major Trauma Networks to receive patients who have major trauma. Further details are described in Regional Major Trauma Destination Policies.

Determining the most appropriate major trauma hospital

- Not all major trauma hospitals have the facilities required to treat all the injuries a patient with major trauma may have. Clinical judgement must be used when determining which major trauma hospital the patient is transported to, taking into account:
  - The information within the Regional Major Trauma Destination Policies, and
  - The patient's expected treatment requirements, and
  - The transport time to the relevant hospitals.
- In most cases, the most appropriate major trauma hospital will be the closest major trauma hospital. However, in some cases there will be a choice of major trauma hospitals that the patient could be transported to and in this setting the patient should be transported to the major trauma hospital with the most appropriate facilities to meet the expected treatment needs of the patient, provided this is feasible and safe.
- Personnel should seek clinical advice if they are uncertain.

Life-threatening problems requiring immediate intervention

- It should be rare for a patient with a life-threatening problem to be transported to a medical facility that is not a major trauma hospital, because delays to definitive care worsen outcomes. However, some patients have a life-threatening problem requiring immediate intervention that cannot be provided by personnel at the scene, such that there is a high risk of death before reaching a major trauma hospital and the problem may be able to be rectified at a closer medical facility. Examples include, but are not limited to:
  - Severe airway obstruction despite manual techniques and airway adjuncts.
  - Inadequate breathing.
  - Severe external bleeding that is not controlled.
- The closest appropriate medical facility will usually be a hospital, but sometimes it will be a medical centre, particularly in remote areas of New Zealand.
- The decision to transport a patient with a life-threatening problem to a medical facility that is not a major trauma hospital requires clinical judgement and personnel should have a low threshold for seeking clinical advice. The decision should take into account the nature of the patient's injuries, the rate of deterioration, the relative proximity of the medical facilities and the personnel available at the medical facility.
- Personnel in the receiving medical facility must be notified as soon as possible, preferably before leaving the scene.
- Staging must be activated via the Ambulance Communications Centre, preferably before leaving the scene, if the medical facility is not a major trauma hospital.

Severe traumatic brain injury (TBI)

- Patients with any of the following clinical features have a high probability of requiring urgent neurosurgery and/or neuro-intensive care and should be transported to a major trauma hospital with neurosurgical facilities, provided this is feasible and safe:
  - RSI is indicated for severe TBI. These patients usually require neuro-intensive care and may require urgent neurosurgery.
  - Lateralising neurological signs, for example unilateral pupil dilatation or unilateral weakness. These patients usually require urgent neurosurgery for extradural or subdural bleeding.
  - Clinically obvious penetrating brain injury. These patients usually require neurosurgery.
- In addition to the above features, transport to a major trauma hospital with neurosurgical facilities should be strongly considered in patients with a progressively falling GCS that is not due to sedation.
- Personnel should have a low threshold for seeking clinical advice if transport to a major trauma hospital with neurosurgical facilities will be prolonged, particularly if the patient is not intubated and ventilated.

Multi-system trauma

- Multi-system trauma is defined as the patient having major injuries to more than one body region. Examples include, but are not limited to, a patient with more than one long bone fracture and a flail chest, or a patient with severe facial injury and a clinically obvious pelvic fracture.
- Patients with multi-system trauma will usually benefit from transport to a tertiary major trauma hospital, provided this is feasible and safe. This is because tertiary major trauma hospitals have additional personnel and facilities to manage patients with multi-system trauma.
- Personnel should seek clinical advice prior to commencing transport, if transport to a tertiary major trauma hospital will be prolonged.

Abnormal Primary Survey

Airway obstruction

- Clinical judgement is required when determining that the patient has manageable airway obstruction (as per step three in the flowchart), rather than life-threatening airway obstruction requiring immediate intervention (as per step one in the flowchart).
- For the majority of patients their airway obstruction is manageable and provided they can be adequately oxygenated using airway adjuncts and supplemental oxygen they should be transported to a major trauma hospital.

Respiratory distress

- A patient with chest wall bruising or a few isolated rib fractures will often have pain when taking a deep breath, but in order to have respiratory distress the patient must have clinical signs of difficulty breathing or severe pain with normal breathing.

Shock

- Shock is a clinical diagnosis and cannot be tightly defined using specified vital signs.
- Clinical signs of shock include tachycardia (unless the patient is beta-blocked or has 'end stage' shock when the heart rate is falling), a narrowed pulse pressure, vasoconstriction, and an altered level of consciousness (this usually occurs late in shock particularly in children and young adults and usually manifests as agitation with preservation of the ability to obey commands).
- Blood pressure is a poor guide to the severity of shock and must be considered as part of the overall clinical picture. Blood pressure may only begin to fall when shock is severe and blood pressure varies with age, sex, degree of fitness and medications.
- If IV fluid is clinically indicated the patient has shock.

Critical haemorrhage

- Critical haemorrhage codes such as Code Crimson and Code Red are used to accelerate clinical care for patients with critical haemorrhage. Personnel who are transporting patients that meet the following criteria should notify personnel in the receiving major trauma hospital as soon as possible that a critical haemorrhage code activation may be required. Where an agreed protocol is in place this may be activated by transporting personnel.
- The criteria for critical haemorrhage code activation in patients with signs of clinically significant haemorrhage are either of the following:
  - An Assessment of Blood Consumption (ABC) score greater than or equal to 2:
    - Heart rate ≥ 120/min.
    - Systolic blood pressure ≤ 90 mmHg.
    - Penetrating truncal trauma.
    - A positive E-FAST scan for free fluid.
  - The patient has received blood products.

Motor score of less than or equal to five

- A motor score of less than or equal to five is a more useful predictor of clinically important TBI than the GCS.
- Consider transporting patients with a falling GCS or severe agitation to a major trauma hospital, even if they are obeying commands.
- A patient with alcohol or drug intoxication who has a motor score of less than or equal to five following a mechanism of injury consistent with TBI, should be presumed to have severe TBI until proven otherwise, even if it is suspected that alcohol or drug intoxication is contributing to the altered level of consciousness. Factors that point towards a higher risk of TBI include a high risk mechanism of injury, clear evidence of physical trauma to the head or face, or a progressively falling level of consciousness.

Injury patterns

Penetrating injury to the neck or torso

- To meet the definition of penetrating injury to the neck or torso, there must be a clinical impression that the injury may have penetrated:
  - The deep tissues when the injured region is the neck.
  - The thoracic cavity when the injured region is the chest.
  - The abdominal cavity when the injured region is the abdomen or pelvis.
- Clinical judgement may be used if the patient has a penetrating injury that appears to only involve skin or subcutaneous tissue and the patient's vital signs are normal, however a high index of suspicion is required for these injuries, and transport should usually occur to a major trauma hospital.

Severe facial injury

- To meet the criteria for severe facial injury patient should have either obvious facial deformity or severe tissue disruption.
- This will usually be due to a high force mechanism of injury.

Flail chest

- Flail chest is a clinical diagnosis. There must be clinical signs of paradoxical chest wall movement with breathing.
- The patient usually has very severe pain, but pain alone is not a diagnostic sign of flail chest.

Clinically obvious pelvic fracture

- A clinically obvious pelvic fracture is defined as an obvious major deformity or clear evidence of a pelvic fracture visible through a wound.
- The most common symptom of a pelvic fracture is the presence of pelvic pain, but the presence of pain alone is not sufficient to diagnose a clinically obvious pelvic fracture.
- There is no role for springing/stressing the pelvis for signs of instability or crepitus, because the pelvis may be severely unstable without these signs being present and the force required to elicit signs may cause harm.

More than one long bone fracture

- For the purposes of meeting criteria for major trauma, a fractured long bone requires the patient to have a clinically obvious fracture of the shaft of the femur, tibia or humerus.
- A fracture that is clinically isolated to the neck of femur or to the ankle is not considered a long bone fracture.
- No distinction is made between closed and compound fractures for the purpose of meeting criteria for major trauma.

Limb injury with amputation, severe bleeding or severe tissue disruption

- To meet criteria for major trauma, amputation or severe limb injury must occur proximal to the wrist or the ankle.
- If direct pressure is not able to control severe bleeding or a tourniquet remains in place the patient should be transported to a major trauma hospital with vascular surgical facilities provided this is feasible and safe. If the bleeding has been controlled without a tourniquet and the limb has normal perfusion transport may occur to a hospital that is not a major trauma hospital, provided it has surgical facilities.
- Severe tissue disruption cannot be tightly defined, however will usually meet one or both of the following criteria:
  - Severe bony and/or soft tissue disruption, or
  - Poor or absent distal perfusion.

Acute spinal cord injury

- Refer to the Spinal Cord Injury Destination Policy.
- If the patient has signs and/or symptoms of acute spinal cord injury, the patient should be transported directly to a spinal cord impairment (SCI) centre provided this is feasible and safe. The patient should be transported to a SCI centre if there are other signs of major trauma in addition to that of spinal cord injury, provided this is feasible and safe, as the SCI centres are also major trauma hospitals.
- If it is not feasible or safe to transport to a SCI centre, for example the patient has other major injuries and is deteriorating, the patient should be transported to the most appropriate major trauma hospital.
- Personnel should seek clinical advice prior to commencing transport if this will involve a prolonged transport time.

Burns

- To meet criteria for direct transport to a regional burns centre, the patient should have partial or full thickness burns of greater than 10% of total body surface area for an adult or greater than 5% of total body surface area for a child. Clinical judgement must be used to determine the most appropriate destination if the transport time will be prolonged, or will bypass the nearest major trauma hospital. Personnel should seek clinical advice if they are uncertain.

- Patients with burns involving the airway should be transported to the nearest major trauma hospital, and RSI should be considered in these patients for airway protection if transport time is prolonged. The signs of airway involvement include:
  - Burns involving the inside of the mouth.
  - Loss of nasal hair.
  - Voice change.
  - Black sputum.
- Burns involving the face, hands or genitals may require treatment in a regional burn centre. However, provided the burn injury is less than or equal to 10% of total body surface area in an adult or less than or equal to 5% of total body surface area in a child, treatment is not usually time sensitive and the patient should usually be transported to the most appropriate hospital, and subsequently transferred if required.

Additional risk factors

- Consider transporting the patient to a major trauma hospital if the patient has injuries and additional risk factors, but does not meet criteria for having major trauma.
- Signs or symptoms of concern. Examples include, but are not limited to:
  - Severe abdominal pain.
  - Severe spinal pain.
  - Signs of limb ischemia or severely impaired limb perfusion.
- High risk mechanisms of concern. Examples include, but are not limited to:
  - Ejection from a vehicle.
  - Person hit by vehicle at >30km/hr.
  - Fall greater than 3 metres.
- Patient risk factors of concern. Examples include, but are not limited to:
  - Elderly.
  - Pregnant.
  - Taking an oral anticoagulant.
  - Known bleeding disorder.
- Even in the presence of additional risk factors, if the patient has apparently minor injuries and normal vital signs, clinical judgement should be used and transport should usually occur to the most appropriate hospital, rather than to a major trauma hospital. This is particularly the case if a major trauma hospital is significantly further away than the alternative hospital.

Staging

Activation of staging by ambulance personnel

- Patients with major trauma should be transported directly to a major trauma hospital, provided this is feasible and safe. However, it may be appropriate for the patient to be transported via another medical facility while a helicopter or road ambulance is simultaneously dispatched to immediately transport the patient onward to a major trauma hospital. This is termed staging and should only occur when all the following apply:
  - The patient meets criteria to be transported to a major trauma hospital, and
  - Transport by road directly to the major trauma hospital is not feasible because of transport time, and
  - The patient has a life-threatening problem requiring immediate intervention that cannot be provided by personnel at the scene, and
  - The patient can be transported to the staging medical facility significantly faster than suitable backup can locate at the scene.

- When a medical facility is being used as a staging point by ambulance personnel:
  - The aim of treatment at the staging medical facility is to provide resuscitation and prepare the patient for immediate onward transport.
  - Ambulance personnel must notify Ambulance Communications Centre personnel that the medical facility is being used as a staging point, prior to arrival at the medical facility and preferably before leaving the scene.
  - Personnel in the staging medical facility must be notified as soon as possible by ambulance personnel that the medical facility is being used as a staging facility.
  - An appropriate helicopter and crew will be dispatched as soon as possible and preferably before the patient leaves the scene. If it is not feasible or safe to use a helicopter, transport will occur by road ambulance provided this is feasible and safe.
  - Air Desk personnel are responsible for arranging onward transport from the staging facility to a major trauma hospital and updating staging facility personnel on the ETA of the helicopter/road ambulance.
- When a helicopter is being dispatched to a medical facility that is being used as a staging facility by ambulance personnel:
  - The helicopter mission will be dispatched as an out-of-hospital mission and not as an inter-hospital transfer.
  - The clinical care of the patient during transport will be provided by the helicopter crew.

Additional information

Hanging

- While hanging is a traumatic injury, and many of these patients will require management in a hospital with ICU facilities, these patients usually do not require urgent surgery or advanced procedures. For this reason, patients following hanging should be transported to the most appropriate hospital which may not be a major trauma hospital.

Determining the most appropriate medical facility

- If the patient does not meet criteria to be transported directly to a major trauma hospital, they should be transported to the most appropriate medical facility, taking into account:
  - The location of the scene.
  - The anticipated healthcare needs of the patient.
  - Where the patient lives.
- The patient should be transported to a medical facility capable of meeting their anticipated healthcare needs provided this is feasible and safe. For example, a patient with a compound fracture should be transported to a hospital with orthopaedic surgical facilities and a patient with minor injuries should be transported to an appropriate medical centre.

Patients that rapidly improve without treatment

- A patient may initially meet criteria for major trauma but then rapidly improve without specific treatment.
- For example, a patient may have lost consciousness and then rapidly recovered, or had respiratory distress from an emotional cause that has rapidly improved.
- Provided the patient is very clearly improving and meets no other criteria for major trauma, clinical judgement should be used and transport should occur to the most appropriate medical facility.