NICE National Institute for Health and Care Excellence

NICE guideline

# Major trauma: service delivery

NICE guideline

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# Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

# Contents

This guideline is the basis of QS166.

# Overview

This guideline covers the organisation and provision of major trauma services in pre-hospital and hospital settings, including ambulance services, emergency departments, major trauma centres and trauma units. It aims to reduce deaths and disabilities in people with serious injuries by providing a systematic approach to the delivery of major trauma care. It does not cover services for people with burns.

The guideline should be read alongside the NICE guidelines on major trauma, spinal injury and complex fractures, which provide clinical recommendations for major trauma care.

NHS England's clinical reference group (CRG) produce the service specification for major trauma. The CRG intends to consider the NICE guidelines on major trauma, major trauma: service delivery, spinal injury and complex fractures in future updates to the service specification which are planned for 2017.

# Who is it for?

- Commissioners of major trauma services, ambulance and hospital trust boards, medical directors, and senior managers in ambulance trusts
- Healthcare professionals and practitioners who provide care for people with major trauma or suspected major trauma in pre-hospital and hospital settings
- People with major trauma or suspected major trauma, their families and carers

# Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

Recommendations apply to both children (under 16s) and adults (16 or over) unless otherwise specified.

## 1.1 Pre-hospital triage

### Recommendations for ambulance trust boards, medical directors and senior managers in ambulance trusts

1.1.1 Provide a pre-hospital major trauma triage tool to differentiate between patients who should be taken to a major trauma centre and those who should be taken to a trauma unit for definitive management.

1.1.2 Choose a pre-hospital major trauma triage tool that includes assessment of physiology and anatomical injury and takes into account the different needs of older patients, children and other high-risk populations (such as patients who take anticoagulants, pregnant women and patients with comorbidities).

1.1.3 Support pre-hospital care providers using the major trauma triage tool with immediate clinical advice from the ambulance control centre.

1.1.4 Train pre-hospital care providers to use the major trauma triage tool.

1.1.5 Monitor and audit use of the major trauma triage tool as part of the major trauma network's quality improvement programme.

# 1.2 Transferring patients with major trauma

## Recommendations for pre-hospital care providers

1.2.1 Be aware that the optimal destination for patients with major trauma is usually a major trauma centre. In some locations or circumstances intermediate care in a trauma unit might be needed for urgent treatment, in line with agreed practice within the regional trauma network.

1.2.2 Spend only enough time at the scene to give immediate life-saving interventions.

1.2.3 Divert to the nearest trauma unit if a patient with major trauma needs a life-saving intervention, such as drug-assisted rapid sequence induction of anaesthesia and intubation, that cannot be delivered by the pre-hospital team.

## Recommendations for senior doctors and nurses in trauma units

1.2.4 Spend only enough time to give life-saving interventions at the trauma unit before transferring patients for definitive treatment.

1.2.5 Be aware that the major trauma centre is the ultimate destination for definitive treatment.

# 1.3 Pre-alert procedures

## Recommendations for medical directors, senior managers and senior pre-hospital care providers within a trauma network

1.3.1 Provide a structured system for recording and receiving pre-alert information. Ensure that the information recorded includes:

- age and sex of the injured person
- time of incident
- mechanism of injury
- injuries suspected

- signs, including vital signs, and Glasgow Coma Scale
- treatment so far
- estimated time of arrival at emergency department
- special requirements
- the ambulance call sign, name of the person taking the call and time of call.

### Recommendation for pre-hospital care providers

1.3.2 Ensure that pre-hospital documentation, including the recorded pre-alert information, is made available to the trauma team quickly and placed in the patient's hospital notes.

### Recommendations for senior managers and senior doctors and nurses in emergency departments

1.3.3 Ensure that a senior nurse or trauma team leader receives the pre-alert information and determines the level of trauma team response according to agreed and written local guidelines.

1.3.4 Ensure that the trauma team leader is easily identifiable to receive the handover and the trauma team is ready to receive the information.

## 1.4 Procedures for receiving patients in trauma units and major trauma centres

### Recommendations for senior managers in trauma units

1.4.1 Ensure that multispecialty trauma teams are activated immediately in trauma units to receive patients with major trauma.

1.4.2 Do not use a tiered team response in trauma units.

1.4.3 Have a paediatric trauma team available immediately for children (under 16s) with major trauma.

### Recommendations for senior managers and senior doctors and

## nurses in major trauma centres

1.4.4 Consider a tiered team response to receive patients in major trauma centres. This may include:

- a standard multispecialty trauma team **or**
- a standard multispecialty trauma team plus specialist involvement (for example, code red for major haemorrhage) and mobilisation of supporting departments and services such as transfusion, interventional radiology and surgery.

1.4.5 Have a paediatric trauma team available immediately for children (under 16s) with major trauma.

# 1.5 Transfer between emergency departments

## Recommendations for ambulance and hospital trust boards, medical directors and senior managers

1.5.1 Provide a protocol for the safe and rapid transfer of patients who need definitive specialist intervention.

1.5.2 Train clinical staff involved in the care of patients with major trauma in the transfer protocol.

1.5.3 Review the transfer protocol regularly.

## Recommendations for senior managers in hospital trusts and senior doctors and nurses in emergency departments

1.5.4 Ensure that patients with major trauma who need critical interventions at a major trauma centre leave the sending emergency department within 30 minutes of the decision to transfer.

# 1.6 Organisation of hospital major trauma services

## Recommendations for hospital trust boards, senior managers and commissioners

1.6.1 Hospital major trauma services should have responsibility and authority for the governance of all major trauma care in hospital.

1.6.2 Provide a dedicated major trauma service for patients with major trauma that consists of:

- a dedicated trauma ward for patients with multisystem injuries
- a designated consultant available to contact 24 hours a day, 7 days a week who has responsibility and authority for the hospital trauma service and leads the multidisciplinary team care
- acute specialist trauma rehabilitation services
- acute specialist services for the paediatric and elderly populations
- a named member of clinical staff (a key worker, often a senior nurse) assigned at each stage of the care pathway who coordinates the patient's care.

## Recommendation for senior managers and key workers in major trauma centres

1.6.3 The key worker should:

- act as a single point of contact for patients, family members and carers, and the healthcare professionals involved in their care
- provide information on how the hospital and the trauma system works (major trauma centres, trauma units and teams)
- attend ward rounds and ensure that all action plans from the ward round are carried out in a timely manner
- provide patient advocacy
- ensure that there is a management plan and identify any conflicts

- organise ongoing care including discharge planning, transfers and rehabilitation.

# 1.7 Documentation

The NICE guideline on major trauma contains recommendations for healthcare professionals on documentation.

## Recommendations for ambulance and hospital trust boards, senior managers and commissioners within a trauma network

1.7.1 Ensure that pre-hospital documentation is standardised within a trauma network, for example using the Royal College of Physicians' Professional guidance on the structure and content of ambulance records.

1.7.2 Ensure that hospital documentation is standardised within a trauma network and there are systems that allow healthcare professionals access to all relevant and current clinical data at different points in the care pathway. This could be by using compatible electronic medical records such as a picture archiving and communication system (PACS) and an image exchange portal.

# 1.8 Monitoring and audit

## Recommendations for ambulance and hospital trust boards, medical directors, senior managers and commissioners

1.8.1 Ensure that there is a major trauma audit programme to evaluate systems, services and processes as part of the major trauma network's quality improvement programme.

1.8.2 Ensure that a major trauma audit programme includes:

- regular review of audits undertaken locally and regionally
- registration with the Trauma Audit and Research Network (TARN)
- accurate and complete data submission to TARN
- quarterly review of TARN reports.

1.8.3 A national trauma audit system should collect and analyse data to enable

providers of major trauma services to review their local, regional and national major trauma performance.

## 1.9 Information and support for patients, family members and carers

The NICE guideline on major trauma contains recommendations for healthcare professionals on information and support.

### Recommendation for ambulance and hospital trust boards, senior managers and commissioners

1.9.1 Establish a protocol for providing information and support to patients, family members and carers.

### Recommendations for healthcare professionals providing information to people with major trauma in the emergency department

1.9.2 The trauma team structure should include a clear point of contact for providing information to patients, family members and carers.

1.9.3 Document all key communications with patients, family members and carers about the management plan.

1.9.4 Allocate a dedicated member of staff to contact the next of kin and provide support for unaccompanied children and vulnerable adults.

1.9.5 For patients who are being transferred from an emergency department to another centre, provide verbal and written information that includes:

- the reason for the transfer
- the location of the receiving centre and the patient's destination within the receiving centre
- the name and contact details of the person who was responsible for the patient's care at the initial hospital.

# 1.10 Training and skills

## Recommendations for ambulance and hospital trust boards, medical directors and senior managers within trauma networks

1.10.1 Ensure that each healthcare professional within the trauma service has the training and skills to deliver, safely and effectively, the interventions they are required to give, in line with the NICE guidelines on non-complex fractures, complex fractures, major trauma and spinal injury.

1.10.2 Enable each healthcare professional who delivers care to patients with major trauma to have up-to-date training in the interventions they are required to give.

1.10.3 Provide education and training courses for healthcare professionals who deliver care to children (under 16s) with major trauma that include the following components:

- safeguarding
- taking into account the radiation risk of CT to children when discussing imaging for them
- the importance of the major trauma team, the roles of team members and the team leader, and working effectively in a major trauma team
- managing the distress families and carers may experience and breaking bad news
- the importance of clinical audit and case review.

# 1.11 Access to major trauma services

## Recommendation for ambulance and hospital trust boards, senior managers and commissioners

1.11.1 Ensure that people with major trauma have access to services that can provide the interventions recommended in this guideline and in the NICE guidelines on non-complex fractures, complex fractures, major trauma and spinal injury. See the appendix for the recommendations for pre-hospital and hospital management of major trauma that might have particular implications for service

delivery.

## Drug-assisted rapid sequence induction of anaesthesia and intubation – recommendation for ambulance and hospital trust boards, medical directors and senior managers

1.11.2 Ensure that drug-assisted rapid sequence induction of anaesthesia and intubation (RSI) is available for patients with major trauma who cannot maintain their airway and/or ventilation, and be aware that RSI should:

- be performed as soon as possible and within 45 minutes of the initial call to the emergency services **and**
- preferably be provided at the scene of the incident and not by diverting to a trauma unit.

(For more information see the section on airway management in pre-hospital and hospital settings in the NICE guideline 'Major trauma'.)

## Interventional radiology and definitive open surgery – recommendation for hospital trust boards, medical directors and senior managers

1.11.3 Ensure that interventional radiology and definitive open surgery are equally and immediately available for haemorrhage control in all patients with active bleeding. (For more information see the section on interventional radiology in the NICE guideline 'Major trauma' and the section on controlling pelvic haemorrhage in the NICE guideline 'Fractures (complex)'.

# Context

According to the National Audit Office's 2010 report Major trauma care in England, 'There is unacceptable variation in major trauma care in England depending upon where and when people are treated. Care for patients who have suffered major trauma, for example following a road accident or a fall, has not significantly improved in the past 20 years despite numerous reports identifying poor practice, and services are not being delivered efficiently or effectively.'

Since then regional trauma networks have been developed across England. Within these networks major trauma centres provide specialised care for patients with multiple, complex and serious major trauma injuries, working closely with local trauma units. This guideline, together with the NICE guidelines on non-complex fractures, complex fractures, major trauma and spinal injury, aims to address areas of uncertainty in the delivery of trauma services.

This guideline includes recommendations on:

- pre-hospital triage
- the destination of patients with major trauma
- the organisation of a hospital major trauma service
- documentation
- national audit systems to improve performance
- provision of information and support for patients with major trauma, their family members and carers.

# More information

You can also see this guideline in the NICE pathway on trauma.

To find out what NICE has said on topics related to this guideline, see our web page on injuries, accidents and wounds.

See also the guideline committee's discussion and the evidence reviews (in the full guideline), and information about how the guideline was developed, including details of the committee.

# Recommendations for research

The guideline committee has made the following recommendations for research.

## 1 Audit

What is the clinical and cost effectiveness of collecting long-term outcomes in a national trauma audit system?

### Why this is important

The UK has a national audit of trauma services in place for adults (Trauma Audit Research Network [TARN]) and entry to this audit is linked to best practice tariff for major trauma centres. An equivalent audit, TARNlet, has been developed for children (under 16s). Data are collected on clinical observations, timing and staffing in the acute phase in patients who are treated at a major trauma centre. Data on longer-term outcomes, for example return to normal activities, after the acute phase are not collected, despite acknowledgement that outcomes are important to monitor the effectiveness of interventions.

## 2 Rehabilitation

What are the barriers to people with major trauma receiving early rehabilitation after rehabilitation assessment? What changes to services are needed to overcome these barriers?

### Why this is important

Major trauma often results in people living with disability that results in a reduced quality of life. It is thus imperative to maximise access to rehabilitation to speed physical and psychological recovery after injury.

A proportion of patients will have complex needs necessitating inpatient rehabilitation from a multidisciplinary team with expertise. A larger group of patients will need ongoing support, rehabilitation and re-enablement once they are discharged home. The major trauma best practice tariff advises that every patient with an Injury Severity Score of 9 or more in either a major trauma centre or a trauma unit should have their rehabilitation needs assessed, and that a rehabilitation prescription should be provided for all patients with rehabilitation needs. The rehabilitation prescription is used to document the rehabilitation needs of patients and identify how their needs

should be addressed. It is unclear whether adequate inpatient and outpatient rehabilitation services for patients with major trauma exist or, if they do exist, what barriers prevent people from using them.

# 3 Dedicated transfer service

Is it clinically and cost effective to provide a dedicated service to transfer patients with major trauma from the emergency department for ongoing care?

## Why this is important

Patients with major trauma may need rapid transfer from the local emergency department to a major trauma centre for specialist care. The local trauma unit's clinical team can transfer them without delay but may not be able to provide specialist treatment during the transfer. A specialist team sent by the receiving centre can provide this specialist care during transfer but the transfer may be delayed while waiting for the specialist team to arrive at the local trauma unit.

# 4 National pre-hospital triage tool

A national pre-hospital triage tool for major trauma should be developed and validated.

## Why this is important

Pre-hospital triage tools identify patients who need to be taken to a major trauma centre, bypassing the local emergency department. They are also used to generate pre-alert or standby calls for a trauma team. Most triage tools in the UK use physiological parameters with diagnostic cut-offs and categorical variables such as mechanism of injury. However, the parameters used, and the weighting given to each parameter, differ across the tools. A national pre-hospital triage tool should be developed and validated that will accurately identify where a patient needs to be taken. This should lead to improved patient outcomes and reduced costs.

# Appendix: Recommendations that might have particular implications for service delivery

Tables 1 and 2 below contain links to recommendations for pre-hospital and hospital management of major trauma in the NICE guidelines fractures (complex), major trauma, major trauma: service delivery and spinal injury that might have particular implications for service delivery. They do not list all the services needed to provide care for patients with major trauma.

The recommendations were reviewed by the guideline committee to identify those with an impact on services through:

- timing – the timing an intervention should be given
- destination of the patient – triaging decisions, initial destination or secondary transfer
- availability of a service – the routine availability of an intervention
- staff skills – expertise not routinely available.

The tables are arranged by clinical area, in alphabetical order.

## Table 1 Pre-hospital management of major trauma: recommendations with implications for service delivery

| Clinical area | Interventions | Recommendations |
|---|---|---|
| Airway management | Basic airway manoeuvres and adjuncts | • Major trauma recommendations 1.2.2 and 1.2.3 |

| | | |
|---|---|---|
| | Drug-assisted rapid sequence induction of anaesthesia and intubation, delivered within 45 minutes of the initial call to the emergency services | • Major trauma recommendations 1.2.1 and 1.2.3<br>• Major trauma: service delivery (this guideline) recommendation 1.11.2 |
| | Supraglottic devices | • Major trauma recommendation 1.2.2 |
| Chest trauma | Open thoracostomy | • Major trauma recommendation 1.3.5 |
| | Needle decompression | • Major trauma recommendation 1.3.5 |
| | Ultrasound performed by specialist team | • Major trauma recommendation 1.3.2 |
| Circulatory access | Peripheral venous access | • Major trauma recommendations 1.5.15 and 1.5.16 |
| | Intra-osseous access | • Major trauma recommendations 1.5.15 and 1.5.16 |
| Fracture, open | Prophylactic antibiotic treatment, delivered as soon as possible and preferably within 1 hour of injury | • Fractures (complex) recommendation 1.1.11 |
| Fracture, pelvic | Pelvic binder application, including purpose-made and improvised pelvic binders | • Fractures (complex) recommendation 1.1.7 |

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|---|---|---|
| Spinal injury | In-line spinal immobilisation | • Spinal injury recommendations 1.1.2, 1.1.4, and 1.1.9 |
| | Assessment using Canadian C-spine rule | • Spinal injury recommendations 1.1.5 and 1.1.6 |

# Table 2 Hospital management of major trauma: recommendations with implications for service delivery

| Clinical area | Interventions | Recommendations |
|---|---|---|
| Circulatory access | Peripheral intravenous access | • Major trauma recommendation 1.5.17 |
| | Intra-osseous access | • Major trauma recommendation 1.5.17 |
| Documentation | Standardised documentation used throughout a trauma network | • Major trauma: service delivery (this guideline) recommendations 1.7.1 and 1.7.2 |
| | Pre-alert information received by senior nurse or trauma team leader in the emergency department, who determines the level of trauma team response | • Major trauma recommendation 1.8.4 |
| | Documentation completed by designated member of trauma team and checked by trauma team leader | • Major trauma recommendations 1.8.8 and 1.8.9 |

| | | |
|---|---|---|
| Haematology | Immediate haematology consultation for anticoagulation reversal | • Major trauma recommendations 1.5.10 and 1.5.11 |
| | Laboratory testing of coagulation to guide blood product protocol | • Major trauma recommendation 1.5.27 |
| | Plasma and red blood cells for fluid replacement | • Major trauma recommendations 1.5.24 and 1.5.25 |
| Information and support for patients, family members and carers | A healthcare professional to facilitate delivery of information | • Major trauma recommendation 1.9.2<br>• Major trauma: service delivery (this guideline) recommendation 1.6.3<br>• Fractures (complex) recommendation 1.4.2<br>• Spinal injury recommendation 1.8.2 |
| | A dedicated member of staff for unaccompanied children and vulnerable adults to contact next of kin and provide personal support | • Fractures (complex) recommendation 1.4.5<br>• Major trauma recommendation 1.9.5<br>• Major trauma: service delivery (this guideline) recommendation 1.9.4<br>• Spinal injury recommendation 1.8.6 |

| | | |
|---|---|---|
| Radiology, imaging | Immediate CT | • Major trauma recommendation 1.4.5 and recommendation 1.5.31 |
| | Whole-body CT | • Fractures (complex) recommendation 1.2.8<br>• Major trauma recommendation 1.5.34 |
| | Immediate eFAST (extended focused assessment with sonography for trauma) | • Major trauma recommendation 1.4.4 |
| | FAST (focused assessment with sonography for trauma) | • Major trauma recommendation 1.5.29 |
| | Ultrasound | • Major trauma recommendation 1.4.6 |
| | X-ray | • Major trauma recommendations 1.4.4 and 1.4.6 and recommendation 1.5.29 |
| | Immediate radiology consultation to interpret results of imaging | • Spinal injury recommendation 1.5.1 |

| | | |
|---|---|---|
| Radiology, interventional | Interventional radiology for haemorrhage control | • Major trauma: service delivery (this guideline) recommendation 1.11.3<br>• Fractures (complex) recommendation 1.2.16<br>• Major trauma recommendations 1.5.40–1.5.43 |
| Surgery | Damage control surgery | • Major trauma recommendation 1.5.37 |
| | Definitive surgery | • Major trauma recommendations 1.5.38 and 1.5.39 |
| | Immediate surgery to explore hard signs of vascular injury | • Fractures (complex) recommendation 1.2.3 |
| Surgery, neurosurgery and spinal | Specialist neurosurgical or spinal surgeon on call immediately for patients with a spinal cord injury | • Spinal injury recommendations 1.6.1 and 1.6.2 |
| | Local spinal cord injury centre consultant | • Spinal injury recommendation 1.6.3 |
| Surgery, orthopaedic | Surgery for pilon fractures, performed within 24 hours of the injury | • Fractures (complex) recommendation 1.2.32 |
| Surgery, orthopaedic and plastic | Surgery performed concurrently by consultants in orthopaedic and plastic surgery to achieve debridement, fixation and cover of an open fracture | • Fractures (complex) recommendation 1.2.27 |

| | | |
|---|---|---|
| Surgery, pelvic | Consultation with pelvic surgeon for unstable pelvic fracture | • Fractures (complex) recommendation 1.2.18 |
| Wound care | Negative pressure wound therapy for open fracture wounds | • Fractures (complex) recommendation 1.2.31 |
| | Photographs of open fracture wounds, taken in accordance with a protocol | • Fractures (complex) recommendation 1.3.4 |

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# Accreditation