

Putting NICE guidance into practice

Resource impact report: Trauma guidelines (NG37–41)

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Summary

NICE has developed 5 guidelines describing and encouraging good practice in the following areas of trauma: [complex fractures](#), [non-complex fractures](#), [spinal injury assessment](#), [major trauma](#) and [major trauma services](#).

This report looks at the combined resource impact of implementing these guidelines in England.

Areas of potential costs are:

- providing airway management in pre-hospital settings
- additional use of CT or MRI for first-line imaging for spinal injury assessment and non-complex fracture
- providing a definitive written report of emergency department X-rays of suspected fractures before the person is discharged from the emergency department.

Areas of potential savings are:

- reduced emergency department costs, saving between £56 and £239 per attendance
- reduced repeat hospital attendances. This may save between £76 and £130 for each avoided adult trauma and orthopaedics attendance, and £93–£144 for each paediatric trauma and orthopaedics attendance
- reduced emergency department consultant time
- a decrease in the use of tourniquets
- not using a rigid cast for torus fractures of the distal radius
- offering K-wire fixation when surgical fixation is needed for dorsally displaced distal radius fractures.

1 Introduction

1.1 NICE has developed 5 guidelines offering best practice advice on trauma care. Each guideline focuses on a different aspect:

- major trauma
- major trauma: service delivery
- spinal injury assessment
- complex fractures
- non-complex fractures.

1.2 This report discusses the resource impact of implementing the guidelines in England. It aims to help organisations plan for the financial implications of implementing NICE guidelines.

1.3 The report was circulated using a consultation period to members of all the 5 guideline committees.

1.4 Trauma care services are commissioned by clinical commissioning groups and NHS England. Providers are primary care services, major trauma centres and other NHS hospitals receiving acute trauma admissions, ambulance services, and rehabilitation services.

2 Background

2.1 Major trauma is the leading cause of death in people under 45 and is a serious public health problem. It is estimated that there are at least 20,000 cases of major trauma each year in England resulting in 5,400 deaths and many others resulting in permanent disabilities requiring long-term care (National Audit Office 2010).

- 2.2 People who have major trauma (injury severity score [ISS] of greater than 15)¹ should be treated in a major trauma centre. Major trauma centres provide specialised care for people with multiple, complex and serious major trauma injuries and they work closely with local trauma units. Major trauma centres operate 24 hours a day, 7 days a week. They are staffed by consultant-led specialist teams, including orthopaedics, neurosurgery and radiology teams with access to diagnostic and treatment facilities.
- 2.3 During 2013–14 there were around 844,200 emergency department attendances with dislocation, fracture, joint injury or amputation as the primary diagnosis. Also there were around 758,400 referrals from emergency departments to fracture clinics (Health and Social Care Information Centre 2015).
- 2.4 Spinal injury involves traumatic fracture or derangement of the spinal column, sometimes leading to spinal cord injury. The incidence of spinal cord injury in the UK is estimated at between 12 and 16 per million people, a wide range in age from infants to the elderly and a majority of injuries caused by trauma ([NHS England](#)). This is equivalent to 600–900 people in England per year, with the majority of cases caused by trauma.

3 Significant resource impact recommendations

3.1 *Airway management in pre-hospital settings*

- Aim to perform rapid sequence induction (RSI) as soon as possible and within 45 minutes of the initial call to the emergency services, preferably at the scene of the incident. If RSI cannot be performed at the scene:
 - consider using a supraglottic device if the patient’s airway reflexes are absent

¹ Injury severity score (ISS) is a clinical scale from 1 to 75 (higher score being more serious) which can classify people after a traumatic incident. Those scoring above 15 are defined as having had major trauma. People with an ISS of 9–15 have moderately severe trauma.

- use basic airway manoeuvres and adjuncts if the patient's airway reflexes are present or supraglottic device placement is not possible
- transport the patient to a major trauma centre for RSI provided the journey time is 60 minutes or less
- only divert to a trauma unit for RSI before onward transfer if a patent airway cannot be maintained or the journey time to a major trauma centre is more than 60 minutes. (Major trauma: assessment and initial management – recommendation 1.2.3)

Background

- 3.1.1 RSI can only be delivered by doctors trained in prehospital emergency medicine. Doctors are already being trained in prehospital emergency medicine nationally. However, this function exists in some areas of England and not in others (predominantly rural). So the availability of people in the prehospital setting to perform the procedure may be limited in some areas.
- 3.1.2 Current practice may be to start with the least invasive device and then increase the complexity until the patient's airway is secure. Patients may end up being taken to a trauma unit for RSI to be performed if it is nearer than a major trauma centre and other methods have failed. A secondary transfer to a major trauma centre would then be needed.

Resource impact

- 3.1.3 There would be a commissioning cost to ensure the service is universally available. There may be costs associated with setting up a formal system in some areas, with doctors trained in prehospital emergency medicine being identified and affiliated to the ambulance service.
- 3.1.4 The recommendation should encourage more efficient dispatching and people with the correct skills responding first.

- 3.1.5 Using RSI as the definitive method of securing the airway may also improve outcomes and result in a decrease in long-term disability.

3.2 Diagnostic imaging

- Perform MRI for children (under 16s) if there is a strong suspicion of:
 - cervical spine cord injury as indicated by the Canadian C-spine rule and by clinical assessment **or**
 - cervical spinal column injury as indicated by clinical assessment or abnormal neurological signs or symptoms, or both. (Spinal injury: assessment and initial management – recommendation 1.5.2)
- Perform CT in adults (16 or over) if:
 - imaging for cervical spine injury is indicated by the Canadian C-spine rule **or**
 - there is a strong suspicion of thoracic or lumbosacral spine injury associated with abnormal neurological signs or symptoms. (Spinal injury: assessment and initial management – recommendation 1.5.6)
- If, after CT, there is a neurological abnormality which could be attributable to spinal cord injury, perform MRI. (Spinal injury: assessment and initial management – recommendation 1.5.7)
- Use CT for first-line imaging in adults (16 or over) with suspected high-energy pelvic fractures. [Fractures (complex): assessment and management – recommendation 1.2.14]
- Consider MRI for first-line imaging in people with suspected scaphoid fractures following a thorough clinical examination. [Fractures (non-complex): assessment and management – recommendation 1.2.3]

Background

- 3.2.1 The NICE guidelines recommend the use of CT and MRI scans when a plain film X-ray may not give an accurate diagnosis. For example, pelvic fractures and some scaphoid fractures, and also

lower cervical and upper thoracic fractures. The true incidence of spinal column injuries converting to spinal cord injuries because of inadequate initial diagnostic imaging or poor management is unknown.

Resource impact

- 3.2.2 The additional use of CT or MRI for first-line imaging will put further demands on resources, which are currently limited. This may mean that organisations need to redesign their imaging services and review the capacity and availability of 7-day working in imaging departments. This should involve using existing resources differently and be linked to planned capital investment in imaging services. Organisations may use the [Good practice guidance on implementing 7 day working in imaging departments](#) to reorganise their imaging departments. The resource impact will depend on whether it is a major trauma centre, a trauma unit or an emergency department.
- 3.2.3 Implementing the guideline recommendations should lead to improved diagnosis of fractures. This may reduce the use of NHS resources from return visits to an emergency department or visits to a GP who may refer the person to secondary care. Potential savings could result from:
- reduced emergency department costs. This may save between £56 and £239 per attendance (Enhanced tariff option for 2015/16)
 - reduced repeat hospital attendances. This may save between £76 and £130 for each avoided adult trauma and orthopaedics attendance, and £93–£144 for each paediatric trauma and orthopaedics attendance (Enhanced tariff option for 2015/16)
 - reduced litigation costs.

3.3 *Hot reporting*

3.3.1 A radiologist, radiographer or other trained reporter should deliver the definitive written report of emergency department X-rays of suspected fractures before the patient is discharged from the emergency department. [Fractures (non-complex): assessment and management – recommendation 1.1.9]

Background

3.3.2 Experts suggest the recommendation primarily relates to the timing of the definitive report. In some areas the report is delivered after the patient has been discharged from the emergency department. Hot reporting is not an entirely new service but provides what should already exist, that is an adequate and definitive image interpretation at a clinically relevant time.

3.3.3 Over the past decade the reporting of emergency department radiographs has been increasingly delegated to appropriately qualified radiographers (Hardy et al. 2013). However, the provision of a definitive report before a person is discharged still varies across the country, with some organisations providing the definitive report after 24 hours.

3.3.4 Experts suggest that the recommendation could be a challenging change in practice in many X-ray departments where 24-hour access to hot reporting is not available 7 days a week.

Resource impact

3.3.5 Clinical experts suggest that many centres already have good arrangements for reporting in hours because of radiology registrars and reporting radiographers. However, depending on local services there may be some costs to cover out of hours.

3.3.6 Providing an immediate interpretation of emergency department X-ray tests could reduce recalls and also enable quick treatment. It

would also reduce inappropriate referrals for follow-up care as a result of false-positive diagnosis. This may help to:

- reduce admissions to hospital
- reduce the number of missed fractures and the need for subsequent patient recall because of a change in the management plan after the patient has left the emergency department. This could save £76–£130 (adult outpatient settings) and £93–£144 (paediatric outpatient settings) (Enhanced tariff option for 2015/16)
- reduce emergency department consultant time reviewing the reports that come back with positive findings 24–48 hours after patient was discharged.

4 Other considerations

4.1 Organisations may also need to consider potential resource implications associated with the following recommendations:

- Providing a dedicated major trauma service that includes a dedicated trauma ward (Major trauma: service delivery – recommendation 1.6.2). In current practice a person may receive care in different wards, dependency settings and hospitals, with transfer or shared care between major trauma centres, trauma units, district general hospitals and community and specialist units. Under this arrangement, there is some concern that people may experience a lack of continuity of care, which may lead to suboptimal outcomes. To address these concerns, in some major trauma centres the care of people with major trauma is supervised by a trauma coordinator, who has responsibility for coordinating care across multiple specialities and settings. The Trauma: service delivery guideline committee believes that where models of multidisciplinary care have already been introduced, healthcare staff would need to be organised differently rather than increase their numbers. However, the

Trauma: service delivery guideline committee agreed that it may be difficult for some hospitals to create a trauma ward covering all specialties on 1 site and this may have some resource implications. Providing a dedicated major trauma service that includes a dedicated trauma ward would help trauma rehabilitation by the consultant lead rehabilitation team.

- Providing a major trauma audit programme that is registered with and submits data to the Trauma Audit and Research Network (TARN) (Major trauma: service delivery – recommendations 1.8.1 to 1.8.3). Hospitals subscribe to TARN at a cost of between £3,700 and £5,800 per year (National Audit Office 2010). Entry to this audit is linked to the best practice tariff for major trauma centres, which can receive best practice tariff payments if they meet certain criteria. For each patient with an ISS higher than 8, there is an extra payment of £1,500. Currently most hospitals submit data to TARN. However, based on the 2015 [performance comparison data](#), the level of completeness of the submitted data varies across the country. Some hospitals may incur additional costs in order to increase the level of data completeness. The costs to achieve this would depend on local needs.
- Timing of debridement, fixation and cover of open fractures [Fractures (complex): assessment and management – recommendations 1.2.27 to 1.2.30]. This has no impact on caseload but affects providers who may need to ensure that additional theatre lists are in place. However, there would also be savings through better outcomes and reduced complications.

5 Benefits and savings

- 5.1 Depending on local practice, there may be some opportunities for savings in the following areas:

- Using simple dressings with direct pressure to control external haemorrhage (Major trauma: assessment and initial management – recommendation 1.5.1).
- Not using a rigid cast for torus fractures of the distal radius [Fractures (non-complex): assessment and management – recommendation 1.3.3]. Not using a rigid plaster cast will avoid a return visit to hospital and could save £76–£130 (adult outpatient settings) and £93–£144 (paediatric outpatient settings) (Enhanced tariff option for 2015/16).
- Offering K-wire fixation when surgical fixation is needed for dorsally displaced distal radius fractures in adults [Fractures (non-complex) assessment and management – recommendations 1.4.6].

6 References

[NHS reference costs 2013–14](#). All NHS trusts and NHS foundation trusts – outpatient attendances (currency code 812 – diagnostic imaging)

[Guide to the enhanced tariff option for 2015/16](#). Outpatient attendances (treatment function 214 – trauma and orthopaedics, and 214 paediatric trauma and orthopaedics)

Hardy M, Snaith B, Scally A (2013) The impact of immediate reporting on interpretive discrepancies and patient referral pathways within the emergency department: a randomised controlled trial. *British Journal of Radiology* 86(1021), 20120112 doi.org/10.1259/bjr.20120112

National Audit Office (2010) [Major trauma care in England](#)

The Health and Social Care Information Centre (2015) [Hospital Episode Statistics for England, Accident and Emergency attendances in England – 2013–14](#)

About this resource impact report

This resource impact report accompanies the NICE guidelines on trauma care ([complex fractures](#), [non-complex fractures](#), [spinal injury assessment](#), [major trauma](#) and [major trauma services](#)) and should be read in conjunction with them. See [terms and conditions](#) on the NICE website.

This report is written in the following context

This report represents the view of NICE, which was arrived at after careful consideration of the available data and through consulting healthcare professionals. The report is an implementation tool and focuses on the recommendations that were considered to have a significant impact on national resource use.

Assumptions used in the report are based on assessment of the national average. Local practice may be different from this, and the impact should be estimated locally.

Implementation of the guidance is the responsibility of local commissioners and providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this resource impact product should be interpreted in a way that would be inconsistent with compliance with those duties.

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