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Spinal injury: assessment and initial management

NICE guideline: short version

Draft for consultation, August 2015

This guideline covers the care of people with spinal column or spinal cord injury secondary to a traumatic event. It includes recommendations on:

- initial triage and management by pre-hospital care staff
- acute stage clinical assessment and management
- acute stage imaging
- timing of referral and the criteria for acceptance by tertiary services
- information and support needs of patients and their families and carers
- documentation.

It does not cover:

- spinal injury that is caused by a disease, rather than a traumatic event
- the assessment and imaging of people who have a [head injury](#) and a suspected cervical spine injury

Who is it for?

- People with suspected spinal column or spinal cord injury secondary to a traumatic event, and their families and carers.
- Healthcare professionals and practitioners who provide care for people with suspected or confirmed spinal injury in pre-hospital and hospital settings.

This version of the guideline contains the recommendations, context and recommendations for research. The Guideline Committee’s discussion and the evidence reviews are in the [full guideline](#).

Other information about how the guideline was developed is on the [project page](#). This includes the scope, and details of the Committee and any declarations of interest.

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1 Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in [Your care](#).

[Using NICE guidelines to make decisions](#) explains how we use words to show the strength of our recommendations, and has information about safeguarding, consent and prescribing medicines.

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

2 **1.1 Assessment and management in pre-hospital** 3 **settings**

4 **Assessment for spinal injury**

5 1.1.1 On arrival at the scene of the incident, use a prioritising sequence
6 to assess people with suspected trauma, for example <C>ABCDE:

- 7 • Catastrophic haemorrhage
- 8 • Airway with in-line spinal immobilisation (for guidance on airway
9 management refer to the draft NICE guideline on major trauma,)
- 10 • Breathing
- 11 • Circulation
- 12 • Disability (neurological)
- 13 • Exposure and environment.

14 1.1.2 At all stages of the assessment:

- 15 • protect the person's cervical spine with manual in-line spinal
16 immobilisation, particularly during any airway intervention, **and**
- 17 • avoid moving the remainder of the spine.

1 1.1.3 Assess the person for spinal injury, initially taking into account the
2 factors listed below check if the person:

- 3 • has any significant distracting injuries
- 4 • is under the influence of drugs or alcohol
- 5 • is confused or uncooperative
- 6 • has a reduced level of consciousness
- 7 • has any spinal pain
- 8 • has any hand or foot weakness (motor assessment)
- 9 • has altered or absent sensation in the hands or feet (sensory
- 10 assessment)
- 11 • has priapism (unconscious or exposed male)
- 12 • has a history of past spinal problems, including previous spinal
- 13 surgery or conditions that predispose to instability of the spine.

14 1.1.4 Carry out full in-line spinal immobilisation if any of the factors in
15 recommendation 1.1.3 are present or if this assessment cannot be
16 done.

17 **Assessment for cervical spine injury**

18 1.1.5 Assess whether the person has a high- or low-risk factor for
19 cervical spine injury using the Canadian C-spine rule as follows:

- 20 • the person has a high-risk factor if they have at least one of the
21 following:
 - 22 – age 65 years or older
 - 23 – dangerous mechanism of injury (fall from a height of greater
24 than 1 metre or 5 steps, axial load to the head – for example
25 diving, high-speed motor vehicle collision, rollover motor
26 accident, ejection from a motor vehicle, accident involving
27 motorised recreational vehicles, bicycle collision, horse riding
28 accidents)
 - 29 – paraesthesia in the upper or lower limbs
- 30 • the person has a low-risk factor if they have at least one of the
31 following factors:

- 1 – involved in a minor rear-end motor vehicle collision
- 2 – not comfortable in a sitting position
- 3 – not been ambulatory at any time since the injury
- 4 – midline cervical spine tenderness
- 5 – delayed onset of neck pain
- 6 and
- 7 – is unable to actively rotate their neck 45 degrees to the left
- 8 and right (the range of the neck can only be assessed safely
- 9 if the person is at low risk and there are no high risk factors).

10

11 1.1.6 Be aware that applying the Canadian C-spine rule to children is
12 difficult and the child's developmental stage should be taken into
13 account.

14 **Management of suspected cervical spine injury**

- 15 1.1.7 Carry out or maintain full in-line spinal immobilisation if:
- 16 • a high risk for cervical spine injury is indicated by the Canadian
 - 17 C-spine rule, **or**
 - 18 • a low risk for cervical spine injury is indicated by the Canadian
 - 19 C-spine rule and the person is unable to actively rotate their
 - 20 neck 45 degrees left and right

21 1.1.8 Do not immobilise the cervical spine in people who have low-risk
22 factors, are pain free and are able to actively rotate their neck 45
23 degrees left and right.

24 **Assessment of suspected thoracic or lumbosacral spine injury**

- 25 1.1.9 Assess the person with suspected thoracic or lumbosacral spine
26 injury using the factors listed in recommendation 1.1.3 as well as
27 these additional factors:
- 28 • age 65 years or older and reported pain in the thoracic or
 - 29 lumbosacral spine

- 1 • dangerous mechanism of injury (fall from a height of greater than
- 2 3 metres; axial load to the head or base of the spine – for
- 3 example falls landing on feet or buttocks, high-speed motor
- 4 vehicle collision, rollover motor accident, lap belt restraint only,
- 5 ejection from a motor vehicle, accident involving motorised
- 6 recreational vehicles, bicycle collision, horse riding accidents)
- 7 • pre-existing spinal pathology, or known or at risk of osteoporosis
- 8 – for example, steroid use
- 9 • suspected spinal fracture in another region of the spine
- 10 • abnormal neurological symptoms (paraesthesia or weakness or
- 11 numbness)
- 12 • on examination:
- 13 – abnormal neurological signs (motor or sensory deficit)
- 14 – new deformity or bony midline tenderness (on palpation)
- 15 – bony midline tenderness (on percussion)
- 16 – midline or spinal pain (on coughing)
- 17 • on mobilisation (sit, stand, step, assess walking): pain or
- 18 abnormal neurological symptoms (stop if this occurs).

19 1.1.10 Be aware that assessing children with suspected thoracic or
20 lumbosacral spine injury is difficult and the child's developmental
21 stage should be taken into account.

22 **Management of suspected thoracic or lumbosacral spine injury**

23 1.1.11 Carry out or maintain full in-line spinal immobilisation if indicated by
24 one or more of the factors listed in recommendations 1.1.3 and
25 1.1.9.

26 1.1.12 Do not immobilise the thoracic or lumbosacral spine in people who
27 do not have any of the factors listed in recommendations 1.1.3 and
28 1.1.9.

1 **How to carry out in-line spinal immobilisation**

2 1.1.13 When immobilising the spine tailor the approach to the person's
3 specific circumstances. See recommendations 1.1.14 and 1.1.18 to
4 1.1.20.

5 1.1.14 The use of spinal immobilisation devices may be difficult and could
6 be counterproductive. In uncooperative, agitated or distressed
7 people, including children, think about letting them find a position
8 where they are comfortable with manual in-line spinal
9 immobilisation.

10 1.1.15 When carrying out full in-line spinal immobilisation in adults,
11 manually stabilise the head with the spine in-line using the following
12 stepwise approach:

- 13
- 14 • Fit an appropriately sized semi-rigid collar unless contraindicated
15 by:
 - 16 – a compromised airway
 - 17 – known spinal deformities, such as ankylosing spondylitis (in
18 these cases keep the spine in the person's current position).
 - 19 • Reassess the airway after applying the collar.
 - 20 • Place the person on a scoop stretcher.
 - 21 • Secure the person with head blocks and tape, ideally in a
vacuum mattress.

22 1.1.16 When carrying out in-line spinal immobilisation in children,
23 manually stabilise the head with the spine in-line using the stepwise
24 approach in recommendation 1.1.15 and consider:

- 25
- 26 • involving family members and carers if appropriate
 - 27 • keeping infants in their car seat if possible
 - 28 • using a scoop stretcher with blanket rolls, vacuum mattress,
vacuum limb splints or Kendrick extrication device.

1 **Extrication**

2 1.1.17 When there is immediate threat to a person's life and rapid
3 extrication is needed, make all efforts to limit spinal movement
4 without delaying treatment.

5 1.1.18 Consider asking a person to self-extricate if they are not physically
6 trapped and have none of the following:

- 7
- 8 • significantly distracting injuries
 - 9 • abnormal neurological symptoms (paraesthesia or weakness or
10 numbness)
 - 11 • spinal pain
 - 12 • high-risk factors for cervical spine injury as assessed by the
Canadian C-spine rule.

13 1.1.19 Explain to a person who is self-extricating that if they develop any
14 spinal pain, numbness, tingling or weakness, they should stop
15 moving and wait to be moved.

16 1.1.20 When a person has self-extricated:

- 17
- 18 • ask them to lay supine on a stretcher positioned adjacent to the
vehicle or incident
 - 19 • in the ambulance, use recommendations 1.1.1 to 1.1.15 to
20 assess them for a spinal injury and manage their condition.

21 1.1.21 Do not transport people on a longboard. The longboard should only
22 be used as an extrication device.

23 **1.2 *Pain management in pre-hospital and hospital***
24 ***settings***

25 **Pain assessment**

26 1.2.1 See the NICE guideline on [patient experience in adult NHS](#)
27 [services \(CG138\)](#) for advice on assessing pain in adults.

1 1.2.2 Assess pain regularly in people with spinal injury using a pain
2 assessment scale suitable for the patient's age, developmental
3 stage and cognitive function.

4 1.2.3 Continue to assess pain in hospital using the same pain
5 assessment scale that was used in the pre-hospital setting.

6 **Pain relief**

7 1.2.4 Offer medications to control pain in the acute phase after spinal
8 injury.

9 1.2.5 For people with spinal injury use intravenous morphine as the first-
10 line analgesic and adjust the dose as needed to achieve adequate
11 pain relief.

12 1.2.6 If intravenous access has not been established, consider the
13 intranasal¹ route for analgesic delivery.

14 1.2.7 Consider ketamine in analgesic doses as a second-line agent.

15 1.2.8 Use intravenous morphine with caution in people with
16 hypovolaemic shock and older people.

17 **1.3 *Immediate destination after injury***

18 **Suspected spinal cord injury**

19 1.3.1 Transport people with suspected acute traumatic spinal cord injury
20 (with or without column injury) to a major trauma centre irrespective
21 of transfer time, unless the person needs an immediate lifesaving
22 intervention.

23 1.3.2 Ensure that time spent at the scene is limited to giving life-saving
24 interventions.

¹ At the time of consultation (August 2015), intranasal morphine and ketamine did not have a UK marketing authorisation for use in children and young people for this indication. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's [Prescribing guidance: prescribing unlicensed medicines](#) for further information.

1 1.3.3 Divert to the nearest trauma unit if a patient with spinal injury
2 needs an immediate life-saving intervention, such as rapid
3 sequence induction of anaesthesia and intubation, that cannot be
4 delivered by the pre-hospital teams.

5 1.3.4 Do not transport people with suspected acute traumatic spinal cord
6 injury (with or without column injury) directly to a spinal cord injury
7 centre from the scene of the incident.

8 **Suspected spinal column injury**

9 1.3.5 Transport adults with suspected spinal column injury without
10 suspected acute spinal cord injury to the nearest trauma unit,
11 unless there are pre-hospital triage indications to transport them
12 directly to a major trauma centre.

13 1.3.6 Transport children with suspected spinal column injury (with or
14 without spinal cord injury) to a major trauma centre.

15 **1.4 *Emergency department assessment and management***

16 1.4.1 On arrival at the emergency department use a prioritising sequence
17 for assessing people with suspected trauma (see recommendation
18 1.1.1).

19 1.4.2 Protect the person's cervical spine as in recommendation 1.1.2 or
20 maintain full in-line spinal immobilisation.

21 1.4.3 Assess the person for spinal injury as in recommendation 1.1.3.

22 1.4.4 Carry out or maintain full in-line spinal immobilisation if indicated
23 (see recommendation 1.1.4).

24 **Suspected cervical spine injury**

25 1.4.5 Assess the person with suspected cervical spine injury using the
26 factors listed in recommendation 1.1.3 and the Canadian C-spine
27 rule (see recommendations 1.1.5 and 1.1.6).

1 1.4.6 Carry out or maintain full in-line spinal immobilisation and request
2 imaging if any of the factors in recommendation 1.1.3 are present
3 or if this assessment cannot be done.

4 1.4.7 Carry out or maintain full in-line spinal immobilisation and request
5 imaging if:

- 6 • a high risk for cervical spine injury is indicated and identified by
7 the Canadian C-spine rule, **or**
- 8 • a low risk for cervical spine injury is indicated and the person is
9 unable to actively rotate their neck 45 degrees left and right.

10 1.4.8 Do not immobilise the cervical spine or request imaging for people
11 who have low-risk factors for cervical spine injury, are pain free and
12 are able to actively rotate their neck 45 degrees left and right.

13 **Suspected thoracic or lumbosacral spine injury**

14 1.4.9 Assess the person with suspected thoracic or lumbosacral spine
15 injury using the factors listed in recommendations 1.1.3, 1.1.9 and
16 1.1.10.

17 1.4.10 Carry out or maintain full in-line spinal immobilisation and request
18 imaging if indicated by one or more of the factors listed in
19 recommendations 1.1.3, 1.1.9 and 1.1.10.

20 **How to carry out in-line spinal immobilisation**

21 1.4.11 When carrying out or maintaining full in-line immobilisation refer to
22 recommendations 1.1.13 to 1.1.16.

23 **1.5 Diagnostic imaging**

24 1.5.1 Imaging should be performed urgently and then interpreted
25 immediately by a radiologist to exclude or confirm spinal injury.

26 **Suspected cervical spine cord or column injury**

27 **Children (under 16 years)**

1 1.5.2 Perform MRI for children if there is a strong suspicion of cervical
2 spine injury as indicated by the risk factors of the Canadian C-spine
3 rule and by clinical assessment.

4 1.5.3 Consider 3 view plain X-rays in children who do not fulfil the criteria
5 for MRI in recommendation 1.5.2 but clinical suspicion remains
6 after repeated clinical assessment.

7 1.5.4 Discuss the findings of the 3 view plain X-rays with a consultant
8 radiologist and perform further imaging if needed.

9 1.5.5 For imaging in children with head injury and suspected cervical
10 spine injury, follow the recommendations in section 1.5 of the NICE
11 guideline on [head injury](#).

12 **Adults**

13 1.5.6 Perform CT in adults with any high-risk factor for cervical spine
14 injury as indicated by the Canadian C-spine rule. If, after CT, a
15 neurological abnormality attributable to spinal cord injury cannot
16 confidently be excluded, perform MRI.

17 1.5.7 For imaging in adults with head injury and suspected cervical spine
18 injury, follow the recommendations in section 1.5 of the NICE
19 guideline on [head injury](#).

20 **Suspected thoracic or lumbosacral injury**

21 ***Suspected column injury only***

22 1.5.8 Perform an X-ray as the first-line investigation for people with a
23 suspected spinal column injury without abnormal neurological signs
24 or symptoms in the thoracic (T1–L3) or lumbosacral region.

25 1.5.9 Perform CT if the X-ray is inadequate or abnormal or there are
26 clinical signs or symptoms of a spinal column injury.

27 1.5.10 If a new spinal column fracture is confirmed assess whether there
28 is a fracture elsewhere in the spine and image if appropriate.

1 ***Suspected column and cord injury in children***

2 1.5.11 In children where there is a strong suspicion of a spinal column
3 injury as indicated by clinical assessment and abnormal
4 neurological signs or symptoms, perform MRI of the thoracic or
5 lumbosacral spine.

6 1.5.12 Consider plain X-rays in children who do not fulfil the criteria in
7 recommendation 1.5.11 for MRI but clinical suspicion remains after
8 repeated clinical assessment.

9 1.5.13 Discuss the findings of the plain X-rays with a consultant radiologist
10 and perform further imaging if needed.

11 ***Suspected column and cord injury in adults***

12 1.5.14 Perform CT in adults with a suspected thoracic or lumbosacral
13 spine injury associated with abnormal neurological signs or
14 symptoms. If, after CT, a neurological abnormality attributable to a
15 spinal cord injury cannot confidently be excluded, perform MRI.

16 **Whole-body CT**

17 1.5.15 Use whole-body CT (consisting of a vertex-to-toes scanogram
18 followed by CT from vertex to mid-thigh) in adults with blunt major
19 trauma and suspected multiple injuries.

20 1.5.16 Use clinical findings and the scanogram to direct CT of the limbs in
21 adults with limb trauma.

22 1.5.17 If a person with a suspected spinal column injury has whole-body
23 CT carry out multiplanar reformatting to show all of the thoracic and
24 lumbosacral regions with sagittal and coronal reformats.

25 1.5.18 Do not routinely use whole-body CT to image children. Use clinical
26 judgement to limit CT to the body areas where assessment is
27 needed.

1 **1.6 Communication with tertiary services**

2 1.6.1 For people in a trauma unit who have a spinal cord injury, the
3 trauma team leader should immediately contact the specialist
4 neurosurgical or spinal surgeon on call in the trauma unit or nearest
5 major trauma centre.

6 1.6.2 For people in a major trauma centre who have a spinal cord injury,
7 the trauma team leader should immediately contact the specialist
8 neurosurgical or spinal surgeon on call.

9 1.6.3 For people who have a spinal cord injury, the specialist
10 neurosurgical or spinal surgeon at the major trauma centre should
11 contact the local spinal cord injury centre consultant within 4 hours
12 of diagnosis.

13 1.6.4 All people who have a spinal cord injury should have a lifetime of
14 personalised care that is guided by a spinal cord injury centre.

15 **1.7 Early management in the emergency department after**
16 **traumatic spinal cord injury**

17 1.7.1 The management of spinal cord injury for people in the emergency
18 department should be agreed with spinal specialists.

19 1.7.2 Do not use the following medications, aimed at providing
20 neuroprotection and prevention of secondary deterioration, in the
21 acute stage after acute traumatic spinal cord injury:

- 22 • methylprednisolone
23 • nimodipine
24 • naloxone.

25
26 1.7.3 Do not use medications in the acute stage after traumatic spinal
27 cord injury to prevent neuropathic pain from developing in the
28 chronic stage.

1 **1.8*****Information and support for patients, family members***
2 ***and carers***

3 Our draft guideline on ‘trauma: service delivery’ contains recommendations for
4 ambulance and hospital trust boards, senior managers and commissioners on
5 support and information for patients, family members and carers.

6 **Providing support**

7 1.8.1 When communicating with patients, family members and carers:

- 8 • manage expectations and avoid misinformation
- 9 • answer questions and provide information honestly, within the
10 limits of your knowledge
- 11 • do not speculate and avoid being overly optimistic or pessimistic
12 when discussing information on further investigations, diagnosis
13 or prognosis
- 14 • ask if there are any other questions.

15 1.8.2 The trauma team structure should include a clear point of contact
16 for providing information to the patient, their family members or
17 carers.

18 1.8.3 Make eye contact and be in the person’s eye line to ensure you are
19 visible when communicating with this person to avoid them moving
20 their head.

21 1.8.4 If possible, ask the patient if they want someone (a family member,
22 carer or friend) with them.

23 1.8.5 If the patient agrees, invite their family member, carer or friend into
24 the resuscitation room, accompanied by a member of staff.

25 **Support for children and vulnerable adults**

26 1.8.6 Allocate a dedicated member of staff to contact the next of kin and
27 provide support for unaccompanied children and vulnerable adults.

- 1 1.8.7 Contact a mental health team as soon as possible for people who
2 have a pre-existing psychological or psychiatric condition that might
3 have contributed to their injury, or a mental health problem that
4 might affect their wellbeing or care in hospital.
- 5 1.8.8 For children and vulnerable adults with spinal injury, enable family
6 members and carers to remain within eyesight if appropriate.
- 7 1.8.9 Work with family members and carers of children and vulnerable
8 adults to provide information and support. Take into account the
9 age, developmental stage and cognitive function of the child or
10 vulnerable adult.
- 11 1.8.10 Include siblings of an injured child when offering support to family
12 members and carers.

13 **Providing information**

- 14 1.8.11 Explain to patients, family members and carers what is wrong, what
15 is happening and why it is happening. Provide:
- 16 • information on known injuries
 - 17 • details of immediate investigations and treatment, and if possible
18 include time schedules
 - 19 • information about expected outcomes of treatment, including
20 time to returning to usual activities and the likelihood of
21 permanent effects on quality of life, such as pain, loss of function
22 or psychological effects.
- 23 1.8.12 Provide information at each stage of management (including the
24 results of imaging) in face-to-face consultations.
- 25 1.8.13 Document all key communications with patients, family members
26 and carers about the management plan.

1 ***Providing information about transfer from an emergency department to***
2 ***a ward***

3 1.8.14 For patients who are being transferred from an emergency
4 department to a ward, provide written information that includes:

- 5 • the name of the senior healthcare professional who spoke to
6 them in the emergency department
- 7 • how the hospital and the trauma system works (major trauma
8 centres, trauma units and trauma teams).

9 ***Providing information about transfer from an emergency department to***
10 ***another centre***

11 1.8.15 For patients who are being transferred from an emergency
12 department to another centre, provide verbal and written
13 information that includes:

- 14 • the reason for the transfer, focusing on how specialist
15 management is likely to improve the outcome
- 16 • the location of the receiving centre and the patient's destination
17 within the receiving centre. Provide information on the linked
18 spinal cord injury centre (in the case of cord injury) or the unit to
19 which the patient will be transferred to (in the case of column
20 injury or other injuries needing more immediate attention)
- 21 • the name and contact details of the person responsible for the
22 patient's care at the receiving centre
- 23 • the name of the senior healthcare professional who spoke to
24 them in the emergency department.

25 **1.9 *Documentation in pre-hospital and hospital settings***

26 Our draft guideline on 'trauma: service delivery' contains recommendations for
27 ambulance and hospital trust boards, senior managers and commissioners on
28 documentation within trauma networks.

29 **Recording information in pre-hospital settings**

30

1 1.9.1 Record the following in patients with spinal injury in pre-hospital
2 settings:

- 3 • <C>ABCDE (catastrophic haemorrhage, airway with spinal
4 protection, breathing, circulation, disability [neurological],
5 exposure and environment)
- 6 • spinal pain
- 7 • motor function, for example hand or foot weakness
- 8 • sensory function, for example altered or absent sensation in the
9 hands or feet
- 10 • priapism in an unconscious or exposed male.

11
12 1.9.2 If possible, record information on whether the assessments show
13 that the person's condition is improving or deteriorating.

14 1.9.3 Record pre-alert information using a structured system and include
15 all of the following :

- 16 • age and sex of the injured person
- 17 • time of incident
- 18 • mechanism of injury
- 19 • injuries suspected
- 20 • signs, including vital signs and Glasgow Coma Scale
- 21 • treatment so far
- 22 • estimated time of arrival at emergency department
- 23 • requirements (such as bloods, specialist services, on-call staff,
24 trauma team or tiered response by trained staff)
- 25 • the ambulance call sign, name of the person taking the call and
26 time of call.

27 **Receiving information in hospital settings**

28 ***At the emergency department***

29 1.9.4 A senior nurse or trauma team leader should receive the pre-alert
30 information and determine the level of trauma team response.

1 1.9.5 The trauma team leader should be easily identifiable to receive the
2 handover and the trauma team ready to receive the information.

3 1.9.6 The pre-hospital documentation, including the recorded pre-alert
4 information, should be quickly available to the trauma team and
5 placed in the patient's hospital notes.

6 **Recording information in hospital settings**

7 1.9.7 Record the items listed in recommendation 1.9.3 as a minimum, for
8 the primary survey.

9 1.9.8 Record the secondary survey results, including a detailed
10 neurological assessment and examination for any spinal pain or
11 spinal tenderness.

12 1.9.9 If spinal cord injury is suspected in people aged over 4 years,
13 complete an ASIA chart (American Spinal Injury Association) as
14 soon as possible before the person is moved to a ward, and record:

- 15 • vital capacity for people over 7 years
- 16 • ability to cough.

17 1.9.10 One member of the trauma team should have designated
18 responsibility for completing all documentation.

19 1.9.11 The trauma team leader should be responsible for checking the
20 information recorded to ensure it is complete.

21 **Sharing information in hospital settings**

22 1.9.12 Follow a structured process when handing over care within the
23 emergency department (including shift changes) and to other
24 departments. Ensure that the handover is documented.

25 1.9.13 Ensure that all patient documentation, including images and
26 reports, goes with the patient when they are transferred to other
27 departments or centres.

1 1.9.14 Produce a written summary within 24 hours of admission, which
2 gives the diagnosis, management plan and expected outcome and
3 is:

- 4 • aimed at the patient's GP
- 5 • written in plain English
- 6 • understandable by patients, family members and carers
- 7 • updated whenever the patient's clinical condition changes
- 8 • readily available in the patient's records
- 9 • sent to the patient's GP on discharge.

10 1.10 ***Training and skills***

11 **These recommendations are for ambulance and hospital trust boards,**
12 **and senior managers.**

13 1.10.1 Provide each healthcare professional and practitioner within the
14 major trauma service the training and skills to deliver, safely and
15 effectively, the interventions they are required to give, in line with
16 the NICE guidelines on non-complex, complex fractures, major
17 trauma and spinal injury assessment.

18 1.10.2 Enable each healthcare professional and practitioner who delivers
19 care to patients with trauma to have up-to-date training in the
20 interventions they are required to give.

21 1.10.3 Provide education and training courses for healthcare
22 professionals and practitioners who deliver care to children with
23 major trauma include the following components:

- 24 • safeguarding
- 25 • taking into account the radiation risk of CT to children when
26 discussing imaging for them
- 27 • the importance of the major trauma team, the roles of team
28 members and the team leader, and working effectively in a major
29 trauma team

- 1 • communicating with distressed relatives and breaking bad news
- 2 • the importance of clinical audit and case review.

3

You can also see this guideline in the NICE pathway on [\[pathway title\]](#).

[Available at publication]

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

4

5 **Implementation: getting started**

6 This section will be completed in the final guideline using information provided
7 by stakeholders during consultation.

8 To help us complete this section, please use the [stakeholder comments form](#)
9 [update hyperlink with guidance number] to give us your views on these
10 questions:

11 1. Which areas will have the biggest impact on practice and be challenging to
12 implement? Please say for whom and why.

13 2. What would help users overcome any challenges? (For example, existing
14 practical resources or national initiatives, or examples of good practice.)

15 **Context**

16 Spinal injury usually involves a fracture of the spinal column, which sometimes
17 leads to spinal cord injury. The main causes of spinal injury are road traffic
18 collisions, falls, violent attacks, sporting injuries and domestic incidents.

19 Although spinal injury affects all ages, young and middle-aged men and older
20 women tend to be the populations at highest risk. Approximately 700 people
21 sustain a new spinal cord injury each year in the UK. These injuries are
22 associated with serious neurological damage, and can result in paraplegia,
23 quadriplegia or death. Currently there are no 'cures' for spinal cord injury and

1 in the UK there are 40,000 people living with long-term disabilities as a result
2 of such injuries.

3 This guideline covers the assessment, imaging and early management of
4 people (adults and children) with spinal column or spinal cord injury secondary
5 to a traumatic event. It includes the following key clinical areas:

- 6 • initial triage and management by pre-hospital care staff
- 7 • acute stage clinical assessment and management
- 8 • acute stage imaging
- 9 • timing of referral and the criteria for acceptance by tertiary services
- 10 • information and support needs of patients and their families and carers
- 11 • documentation
- 12 • training and skills.

13 The guideline does not cover spinal injury that is caused by a disease, rather
14 than a traumatic event.

15 **Recommendations for research**

16 The Guideline Committee has made the following recommendations for
17 research.

18 ***1 Neuropathic pain relief***

19 Does early treatment with a centrally acting analgesic (for example
20 pregabalin) reduce the frequency or severity of neuropathic pain in people
21 with spinal cord injury?

22 **Why this is important**

23 Neuropathic pain occurs in 40% of people with spinal cord injury. It can be
24 severe and disabling, and in people with spinal cord injury it can lead to
25 further impairment of function. Having neuropathic pain can also result in
26 increased care needs and costs of care, and make it difficult to find
27 employment. It also increases the risk of significant depressive illness and
28 suicide. Research is needed to address whether early treatment of spinal cord

1 injury with a centrally acting analgesic such as pregabalin might reduce the
2 frequency or severity of neuropathic pain.

3 ***2 Disclocation***

4 What is the clinical and cost effectiveness of emergency reduction of cervical
5 spinal dislocations following acute traumatic cervical spinal injury?

6 **Why this is important**

7 Half of all traumatic spinal cord injuries involve the cervical spinal cord, and a
8 large proportion of these are caused by cervical spinal dislocation. Cervical
9 spinal cord injury caused by traumatic cervical spinal dislocation produces
10 permanent disability. The greater the permanent neurological impairment the
11 greater the disability. A high level of disability is associated with less
12 independence, fewer opportunities for a full life, reduced prospects for
13 employment and a shorter life expectancy. Any intervention that improves the
14 neurological outcome in this group of people will improve all of these adverse
15 outcomes.

16 ***3 Thoracic and lumbosacral assessment tool***

17 After injury, what is the best method of clinical assessment to determine who
18 needs imaging of the thoracic and lumbar spine to exclude injury to the spinal
19 column or cord, and who is safe to discharge without risk of missing significant
20 injury?

21 **Why this is important**

22 Injuries to the thoracic and lumbar spine are associated with significant
23 morbidity and can be associated with relatively minor mechanisms of injury.
24 This is a particular problem in older people where such injuries can have a
25 significant impact on their mobility, functional status and level of
26 independence.

27 ISBN