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Fractures (non-complex): assessment and management

NICE guideline: short version Draft for consultation, August 2015

This guideline covers the diagnosis, management and follow-up of non-complex fractures in children (under 16s) and adults (over 16s). It includes recommendations in the following key clinical areas:

- initial pain management and immobilisation
- acute stage assessment and diagnostic imaging
- management in the emergency department
- ongoing management
- documentation
- information and support for people with non-complex fractures and their families and carers.

The guideline does not cover all situations for every individual fracture. It is based around a group of topics that should be considered as representative of an evidence-based guide to the general management of non-complex fractures and it provides recommendations for areas in which there is variation in practice. It does not cover skull fractures, hip fractures, spinal injuries and open fractures. These are covered by other NICE guidelines.

Who is it for?

- Healthcare professionals and healthcare practitioners who deliver care for people with non-complex fractures.
- Providers of NHS services for people with non-complex fractures.
- Commissioners of NHS services for people with non-complex fractures.
- People with non-complex fractures, their families and carers.

This version of the guideline contains the recommendations, context and recommendations for research. The 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 Guideline 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](#).

[How to use NICE guidelines](#) 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. Some recommendations on management depend on whether the growth plate of the injured bone has closed (skeletal maturity). The age at which this happens varies. In practice, healthcare professionals use clinical judgement to determine whether a bone is skeletally mature. When a recommendation depends on skeletal maturity this is clearly indicated.

2 **1.1 Initial pain management and immobilisation**

3 **Pain assessment**

4 1.1.1 See the NICE guideline on [patient experience in adult NHS](#)
5 [services \(CG138\)](#) for advice on assessing pain in adults.

6 1.1.2 Assess pain regularly in people with fractures using a pain
7 assessment scale suitable for the person's age, developmental
8 stage and cognitive function.

9 1.1.3 Continue to assess pain in hospital using the same pain
10 assessment scale that was used in the pre-hospital setting.

11 **Initial pharmacological management of pain in adults (over 16s)**

12 1.1.4 For the initial management of pain in adults (over 16s) with
13 suspected long bone fractures of the legs (tibia, fibula) or arms
14 (humerus, radius, ulna), offer:

- 15 • oral paracetamol for mild pain

- 1 • oral paracetamol and codeine for moderate pain
2 • intravenous paracetamol supplemented with intravenous
3 morphine titrated to effect for severe pain.

4 1.1.5 Use intravenous opioids with caution in frail or older adults.

5 1.1.6 Do not offer non-steroidal anti-inflammatory drugs (NSAIDs) to frail
6 or older adults.

7 1.1.7 Consider NSAIDs to supplement the pain relief in recommendation
8 1.1.4 except for frail or older adults.

9 **Initial pharmacological management of pain in children (under 16s)**

10 1.1.8 For the initial management of pain in children (under 16s) with
11 suspected long bone fractures of the legs (femur, tibia, fibula) or
12 arms (humerus, radius, ulna), offer:

- 13 • one or more out of oral ibuprofen or paracetamol for mild to
14 moderate pain
15 • intranasal or intravenous opioids for moderate to severe pain
16 (use intravenous opioids if intravenous access has been
17 established).

18 **Femoral nerve blocks in children (under 16s)**

19 1.1.9 Consider a femoral nerve block or fascia iliaca block in the
20 emergency department for children (under 16s) with suspected
21 displaced femoral fractures.

22 **Splinting long bone fractures in the pre-hospital setting**

23 1.1.10 In the pre-hospital setting, consider the following for people with
24 suspected long bone fractures of the legs:

- 25 • a traction splint or adjacent leg as a splint if the suspected
26 fracture is above the knee
27 • a vacuum splint for all other suspected long bone fractures.

1 **1.2 *Acute stage assessment and diagnostic imaging***

2 **Use of clinical prediction rules for suspected knee fractures**

3 1.2.1 Use the Ottawa knee rules to determine whether an X-ray is
4 needed in people over 2 years with suspected knee fractures.

5 **Use of clinical prediction rules for suspected ankle fractures**

6 1.2.2 Use the Ottawa ankle and foot rules to determine whether an X-ray
7 is needed in people over 5 years with suspected ankle fractures.

8 **Imaging of scaphoid fractures**

9 1.2.3 Consider MRI for first-line imaging in people with suspected
10 scaphoid fractures.

11 **Hot reporting**

12 1.2.4 A radiologist, radiographer or other trained reporter should deliver
13 the definitive written report of emergency department X-rays of
14 suspected fractures before the patient is discharged from the
15 emergency department.

16 **1.3 *Management in the emergency department***

17 **Reduction of distal radius fractures**

18 1.3.1 Consider intravenous regional anaesthesia (Bier's block) when
19 reducing dorsally displaced distal radius fractures in adults
20 (over 16s) in the emergency department. This should be performed
21 by healthcare professionals trained in the technique, not
22 necessarily anaesthetists.

23 1.3.2 Do not use gas and air (nitrous oxide and oxygen) on its own when
24 reducing dorsally displaced distal radius fractures in the emergency
25 department.

26 **Management of torus fractures**

27 1.3.3 Do not use a rigid cast for torus fractures of the distal radius.

- 1 1.3.4 Discharge children with torus fractures after first assessment and
2 advise parents and carers that further review is not usually needed.

3 **1.4 Ongoing management**

4 **Non-surgical management of unimalleolar ankle fractures**

5 1.4.1 In the non-surgical management of unimalleolar ankle fractures:

- 6 • advise immediate unrestricted weight-bearing as tolerated
7 • arrange for orthopaedic follow-up in 1 week if there is uncertainty
8 about stability
9 • advise all patients to return for review if symptoms are not
10 improving 6 weeks after injury.

11 **Timing of surgery for ankle fractures**

12 1.4.2 If treating an ankle fracture with surgery, consider operating on the
13 day of injury or the next day.

14 **Timing of surgery for distal radius fractures**

15 1.4.3 When needed for distal radius fractures, perform surgery:

- 16 • within 72 hours of injury for intra-articular fractures
17 • within 7 days of injury for extra-articular fractures.

18 1.4.4 When needed for re-displacement of distal radius fractures,
19 perform surgery within 72 hours of the decision to operate.

20 **Definitive treatment of distal radius fractures in adults (skeletally 21 mature)**

22 1.4.5 Consider manipulation and a plaster cast in adults (skeletally
23 mature) with dorsally displaced distal radius fractures.

24 1.4.6 When surgical fixation is needed, offer adults (skeletally mature)
25 with dorsally displaced distal radius fractures:

- 26 • K-wire fixation if:

- 1 – no fracture of the articular surface of the radial carpal joint is
2 detected, or
3 – displacement of the radial carpal joint can be reduced by
4 closed manipulation
5 • open reduction and internal fixation if closed reduction of the
6 radial carpal joint is not possible.

7 **Definitive treatment of distal radius fractures in children (skeletally**
8 **immature)**

9 1.4.7 In children (skeletally immature) with dorsally displaced distal
10 radius fractures (including fractures involving a growth plate) who
11 have undergone manipulation, consider:

- 12 • a below-elbow plaster cast, or
13 • K-wire fixation if the fracture is completely displaced (off-ended).

14 **Definitive treatment of humerus fractures in adults (skeletally mature)**

15 1.4.8 Offer non-surgical management as definitive treatment for adults
16 (skeletally mature) with displaced low-energy proximal humerus
17 fractures.

18 **Definitive treatment of femoral fractures in children (skeletally immature)**

19 1.4.9 Admit all children (skeletally immature) with femoral shaft fractures
20 and consider 1 of the following according to age and weight:

- 21 • prematurity and birth injuries: simple padded splint
22 • 0 to 6 months: Pavlik's harness or Gallows traction
23 • 3 to 18 months (but not in children over 15 kg): Gallows traction
24 • 1 to 6 years: straight leg skin traction (becomes impractical in
25 children over 25 kg) with possible conversion to hip spica cast to
26 enable early discharge
27 • 4 to 12 years (but not in children over 50 kg): elastic
28 intramedullary nail

- 1 • 11 years to skeletal maturity (weight more than 50 kg): elastic
2 intramedullary nails supplemented by end-caps, lateral-entry
3 antegrade rigid intramedullary nail, or submuscular plating.

4 **Mobilisation after surgery in people with distal femoral fractures**

- 5 1.4.10 Consider advising immediate unrestricted weight-bearing as
6 tolerated for people who have had surgery for distal femoral
7 fractures.

8 **1.5 Documentation, information and support**

9 Our draft guideline on trauma: service delivery contains recommendations for
10 ambulance and hospital trust boards, senior managers and commissioners on
11 documentation within trauma networks.

12 **Documentation**

- 13 1.5.1 Consider developing and using standard documentation to prompt
14 the assessment of the following from first presentation in people
15 with fractures:

- 16 • safeguarding
17 • comorbidities
18 • falls risk
19 • description of fracture, including classification where possible.

- 20 1.5.2 Follow a structured process when handing over care within the
21 emergency department (including shift changes) and to other
22 departments. Ensure that the handover is documented.

- 23 1.5.3 Ensure that all patient documentation, including images and
24 reports, goes with patients when they are transferred to other
25 departments or centres.

- 26 1.5.4 Produce a written summary within 24 hours of admission, which
27 gives the diagnosis, management plan and expected outcome and
28 is:

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

7 1.5.5 If possible, ask the patient if they want someone (family member,
8 carer or friend) with them.

9 ***Support for children and vulnerable adults***

10 1.5.6 Allocate a dedicated member of staff to contact the next of kin and
11 provide support for unaccompanied children and vulnerable adults.

12 1.5.7 For children and vulnerable adults with fractures, enable parents
13 and carers to remain within eyesight if appropriate.

14 1.5.8 Work with family members and carers of children and vulnerable
15 adults to provide information and support. Take into account the
16 age, developmental stage and cognitive function of the child or
17 vulnerable adult.

18 1.5.9 Include siblings of an injured child when offering support to family
19 members or carers.

20 1.5.10 Address issues of non-accidental injury before discharge in all
21 children with femoral fractures. This is particularly important for
22 children who are not walking or talking. For more information, see
23 the NICE guideline on [when to suspect child maltreatment](#).

24 ***Support for people having procedures***

25 1.5.11 Reassure people while they are having procedures for fractures
26 under local and regional anaesthesia.

27 **Communication**

28 1.5.12 When communicating with patients, family members and carers:

- 1 • manage expectations and avoid misinformation
- 2 • answer questions and provide information honestly, within the
- 3 limits of your knowledge
- 4 • do not speculate and avoid being overly optimistic or pessimistic
- 5 when discussing information on further investigations, diagnosis
- 6 or prognosis
- 7 • ask if there are any other questions.

8 1.5.13 Document all key communications with patients, family members
9 and carers about the management plan.

10 **Providing information**

11 1.5.14 Explain to patients, family members and carers, what is happening
12 and why it is happening. Provide:

- 13 • information on known injuries.
- 14 • details of immediate investigations and treatment, and if possible
- 15 include time schedules.

16 1.5.15 Offer people with fractures the opportunity to see images of their
17 injury taken before and after treatment.

18 1.5.16 Provide both verbal and written information on the following when
19 the management plan is agreed for people with fractures:

- 20 • expected outcomes of treatment, including time to returning to
- 21 usual activities and the likelihood of any permanent effects on
- 22 quality of life (such as pain, loss of function or psychological
- 23 effects)
- 24 • activities they can do to help themselves
- 25 • home care options, if needed
- 26 • rehabilitation, including whom to contact and how (this should
- 27 include information on the importance of active participation for
- 28 achieving goals and the expectations of rehabilitation)

- 1 • mobilisation and weight-bearing, including upper limb load-
2 bearing for arm fractures.

3 1.5.17 Provide information at each stage of management (including the
4 results of imaging) in face-to-face consultation.

5 1.5.18 Ensure that all health and social care practitioners have access to
6 information previously given to people with fractures to enable
7 consistent information to be provided.

8 ***Providing information about transfer from the emergency department to***
9 ***a ward***

10 1.5.19 For patients who are being transferred from an emergency
11 department to a ward, provide written information that includes:

- 12 • the name of the senior healthcare professional who spoke to
13 them in the emergency department
14 • how the hospital and the trauma system works (major trauma
15 centres, trauma units, trauma teams and fracture clinics).

16 ***Providing information about transfer from the emergency department to***
17 ***another centre***

18 1.5.20 For patients who are being transferred from an emergency
19 department to another centre, provide verbal and written
20 information that includes:

- 21 • the reason for the transfer, focusing on how specialist
22 management is likely to improve the outcome
23 • the location of the receiving centre and the patient's destination
24 within the receiving centre
25 • the name and contact details of the person responsible for the
26 patient's care at the receiving centre
27 • the name of the senior healthcare professional who spoke to
28 them in the emergency department.

1 **1.6 *Training and skills***

2 **These recommendations are for ambulance and hospital trust boards,**
3 **and senior managers within trauma networks.**

4 1.6.1 Provide each healthcare professional and practitioner within the
5 trauma service with the training and skills to deliver, safely and
6 effectively, the interventions they are required to give, in line with
7 the NICE guidelines on non-complex fractures, complex fractures,
8 major trauma and spinal injury assessment.

9 1.6.2 Enable each healthcare professional and practitioner who delivers
10 care to people with fractures to have up-to-date training in the
11 interventions they are required to give.

12

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

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

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2 **Implementation: getting started**

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

5 To help us complete this section, please use the [stakeholder comments form](#)
6 to give us your views on these questions:

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

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

11

1 **Context**

2 The annual incidence of fractures in Britain is about 3.6% and the lifetime
3 prevalence nearly 40%. Most of the 1.8 million fractures that occur in England
4 each year are non-complex, and include a wide range of injuries over the
5 complete age range from infancy to old age. Many different bones can be
6 involved and the mechanisms of injury are many and varied. The range of
7 treatment options is also wide. Because of this, non-complex fractures present
8 an enormous challenge to healthcare systems.

9 Many non-complex fractures get better with minimal clinical intervention. But
10 healthcare systems can overcomplicate matters, with unnecessary time and
11 effort being expended on fractures that are likely to get better without
12 treatment. However, some non-complex fractures can appear minor and be
13 easily missed, but have the potential for a poor long-term outcome; scaphoid
14 fracture is an example. So there is a need to achieve a balance between
15 making sure that injuries needing treatment are not missed and treatment is
16 avoided for injuries that are likely to get better on their own.

17 This guideline covers the diagnosis, management and follow-up of non-
18 complex fractures in children (under 16s) and adults (over 16s). It includes
19 recommendations in the following key clinical areas:

- 20 • initial pain management and immobilisation
- 21 • acute stage assessment and diagnostic imaging
- 22 • management in the emergency department
- 23 • ongoing management
- 24 • documentation
- 25 • information and support for people with fractures and their families and
26 carers.

27 The guideline does not cover all potential situations for every individual
28 fracture. It is based around a group of topics that should be considered as
29 representative of an evidence-based guide to the general management of
30 non-complex fractures and it provides recommendations for areas in which

1 there is variation in practice. It does not cover prevention, management of
2 dislocations and conditions predisposing to fractures (for example,
3 osteoporosis and arthritis) and management after referral to a specialist clinic.

4 The guideline does not cover skull fractures, hip fractures, spinal injuries and
5 open fractures. These are covered by other NICE guidelines.

6 **Recommendations for research**

7 The Guideline Committee has made the following recommendations for
8 research.

9 ***1 Imaging of ankle fractures***

10 Is CT scanning in addition to initial plain film X-ray clinically effective and cost
11 effective for planning surgical treatment of unstable/displaced ankle fractures
12 compared with plain film X-ray alone?

13 **Why this is important**

14 Ankle fractures are common and affect a significant number of people every
15 year. Outcomes following surgery are important for patients' long-term
16 function and quality of life, and may also be associated with additional cost if
17 another operation is needed. It is important to know whether adding CT
18 scanning to plain film X-ray improves outcomes following surgery and is cost
19 effective.

20 ***2 Virtual compared with face-to-face clinics***

21 What is the clinical and cost effectiveness of virtual new patient fracture clinics
22 compared with next-day consultant-led face-to-face clinics in people
23 presenting with non-complex fractures in the emergency department and
24 thought to need an orthopaedic opinion?

25 **Why this is important**

26 Currently many people with fractures are asked to attend a next-day clinic led
27 by a consultant, although it is believed that a virtual clinic may be at least as
28 effective. If this is the case, face-to-face clinics may be an unnecessary use of

1 time and resources for both patients and the NHS. Firm evidence of clinical
2 and cost effectiveness is needed before virtual clinics can be introduced as
3 part of a change in service structure.

4 ***3 Image guidance in the reduction of displaced distal radius*** 5 ***fractures***

6 For patients with displaced fractures of the distal radius, is manipulation with
7 real-time image guidance more clinically and cost effective than manipulation
8 without real-time image guidance?

9 **Why this is important**

10 In a large minority of patients with a distal radius fracture, the bone fragments
11 are displaced and need manipulation and reduction into an anatomical
12 position. Currently in the NHS, most manipulations for distal radius fractures
13 are performed in the emergency department without real-time image
14 guidance. It is believed that image guidance may be important, but despite
15 hundreds of people having manipulation for these fractures in the emergency
16 department each day, there are no high-quality studies in this area.

17 ***4 Post-operative weight-bearing in people with ankle fractures***

18 What is the most clinically effective and cost effective strategy for weight-
19 bearing in people who have had surgery for internal fixation of an ankle
20 fracture?

21 **Why this is important**

22 In the NHS, open reduction and internal fixation of the ankle is often
23 performed. Currently there is variation in the advice about mobilisation and
24 weight-bearing given to people who have had this done. There is uncertainty
25 as to whether people should be advised to immediately start unrestricted
26 weight-bearing as tolerated or to wait a number of weeks.

1 **5 Treatment of torus fractures**

2 What is the clinical effectiveness and cost effectiveness of no treatment for
3 torus fractures of the distal radius in children compared with soft splints,
4 removable splints or bandages?

5 **Why this is important**

6 Torus fractures of the distal radius are among the most common fractures in
7 children but management varies widely between immediate discharge from
8 the emergency department to repeated outpatient reviews with casting and
9 imaging. These fractures result from trauma to growing bones and account for
10 an estimated 500,000 emergency department attendances a year in the UK.
11 Current treatment often involves application of a bandage, or a removable
12 cast or a soft cast, with review in outpatient clinics and repeated X-ray
13 imaging. This is despite anecdotal evidence that treatment with simple
14 analgesia and immediate discharge from the emergency department is safe
15 and effective. There have been no studies comparing current treatments with
16 no intervention in children with torus fractures. A randomised controlled trial is
17 needed to evaluate the clinical and cost effectiveness of no treatment
18 compared with soft splints, removable splints or bandages. The trial should
19 enrol children aged 1 to 9 years with isolated torus fractures of the distal
20 radius. The primary outcome should be patient-reported pain or discomfort.
21 Secondary outcomes should include parent/carer-reported satisfaction with
22 treatment, return to normal activities, skin problems and repeat fracture.

23 ISBN