NICE National Institute for Health and Care Excellence

Interactive Infographic Slide Set

NG37
Fractures (complex):
assessment and management

START

This resource presents **every** recommendation from the NICE Guideline, Fractures (complex): assessment and management accompanied by infographics.

It can be used to:

- read the guideline recommendations
- teach the guideline recommendations

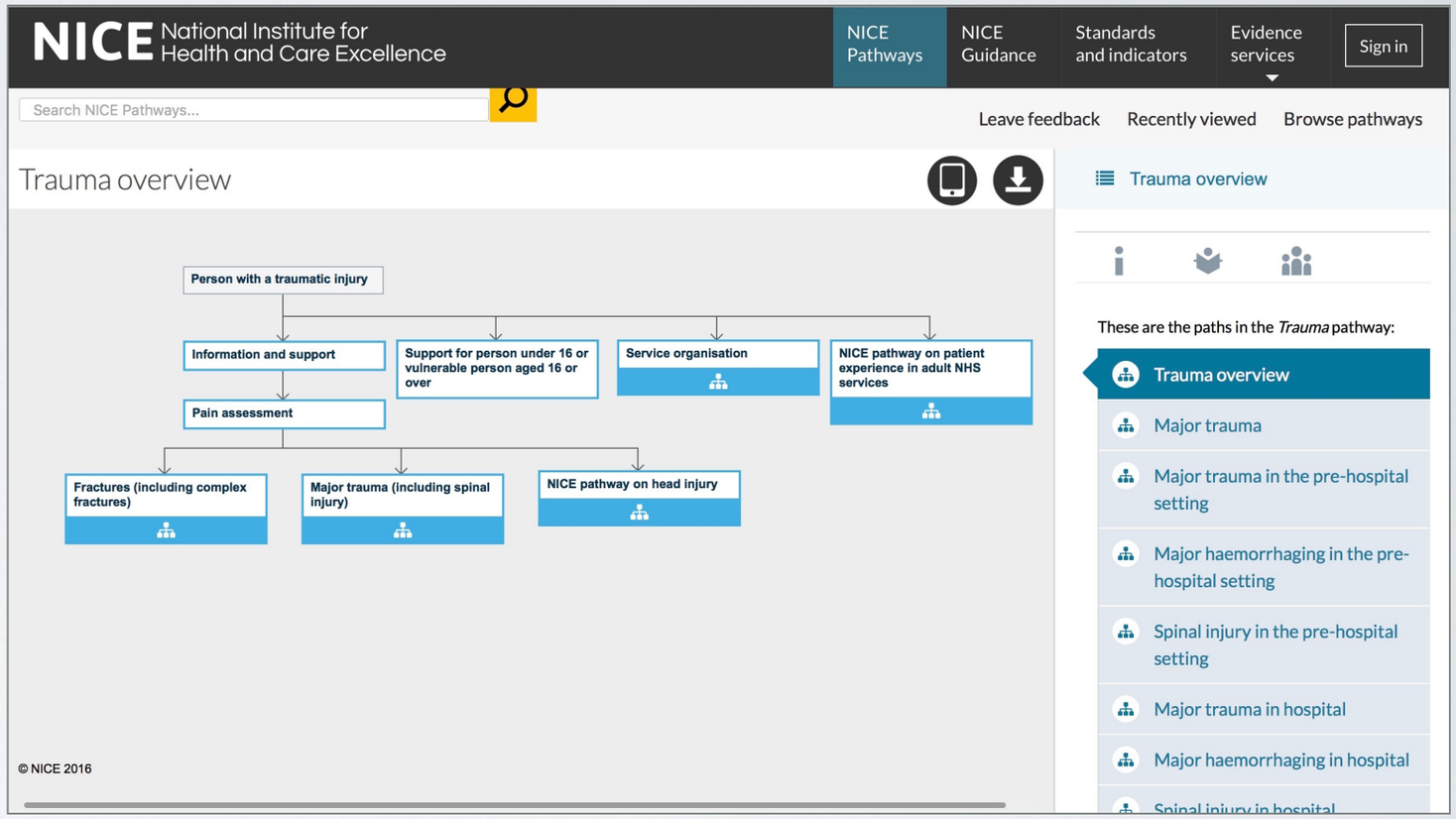
Click here to access the full guideline instead.

http://www.nice.org.uk/guidance/ng37

CONTINUE

NICE Pathways

Our online tool provides quick and easy access, topic by topic, to the range of guidance from NICE, including quality standards, technology appraisals, clinical, public health and social care guidelines and NICE implementation tools.



Access the pathway for trauma by clicking opposite:

CONTINUE

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

See our website on making decisions using NICE guidelines to find out how we use words to show the strength (or certainty) of our recommendations, and 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. 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 skeletal maturity. When a recommendation depends on skeletal maturity this is clearly indicated.

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1.1 Pre-hospital settings

1.2 Hospital Settings

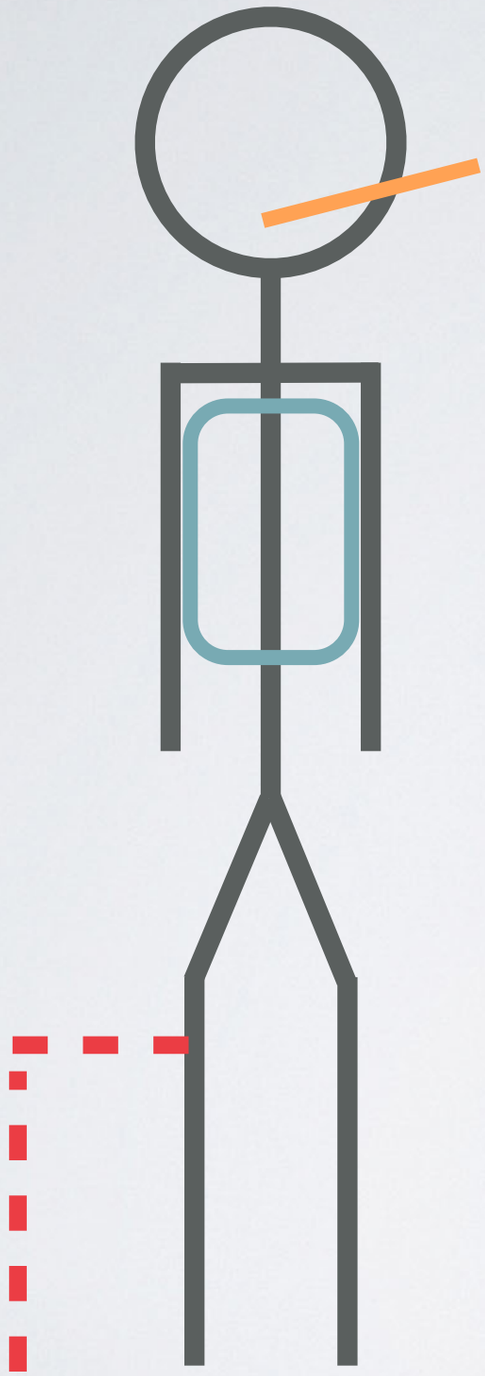
1.3 Documentation

1.4 Information and support for patients, family members and carers

1.5 Training and skills

1.1 PRE-HOSPITAL SETTINGS

START



1.1.1
For recommendations on managing airways, recognising and managing chest trauma, controlling external haemorrhage and fluid replacement, see the NICE guideline on major trauma.

Initial Pharmacological Management of Pain

NICE Guideline on Major Trauma

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1.1.2
For recommendations on pain assessment in people with suspected complex fractures, see the NICE guideline on major trauma.

1.1.3
For recommendations on the initial pharmacological management of pain in people with suspected open fractures, see the NICE guideline on major trauma.

NICE Guideline on Major Trauma

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1.1.4
For recommendations on the initial pharmacological management of pain in people with suspected high-energy pelvic fractures, see the NICE guideline on major trauma.

1.1.5
For recommendations on the initial pharmacological management of pain in adults with suspected low-energy pelvic fractures, see the NICE guideline on hip fracture.

NICE Guideline on Hip Fracture

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NICE Guideline on Non-Complex Fractures

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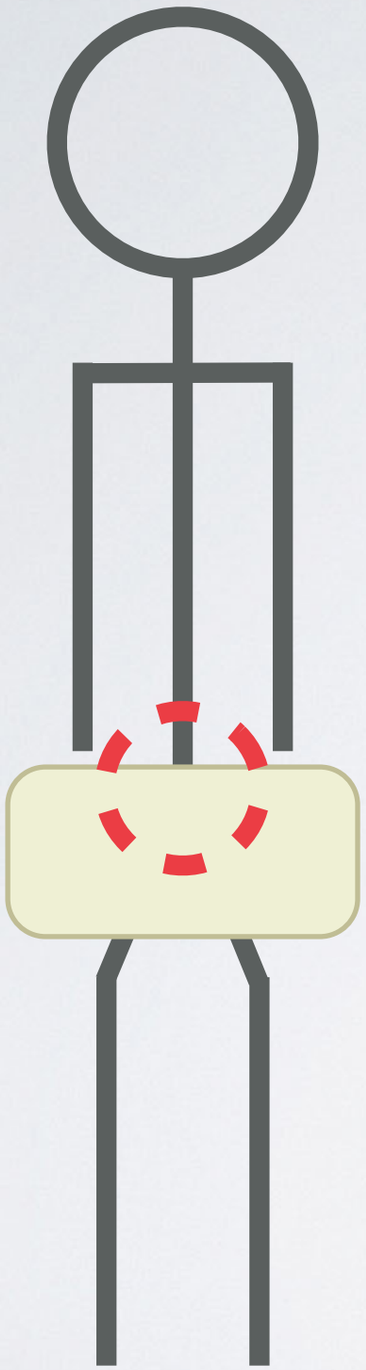
1.1.6
For recommendations on the initial pharmacological management of pain in adults with suspected pilon fractures and children with suspected intra-articular distal tibia fractures, see the NICE guideline on non-complex fractures.

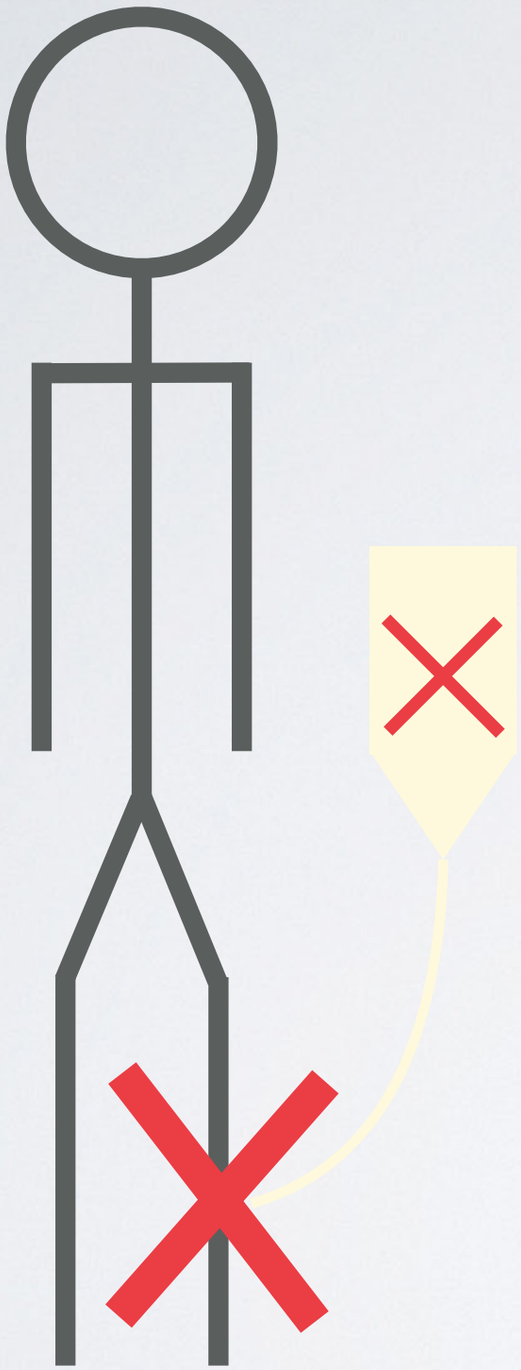
Using a Pelvic Binder



1.1.7
If active bleeding is suspected from a pelvic fracture following blunt high-energy trauma:

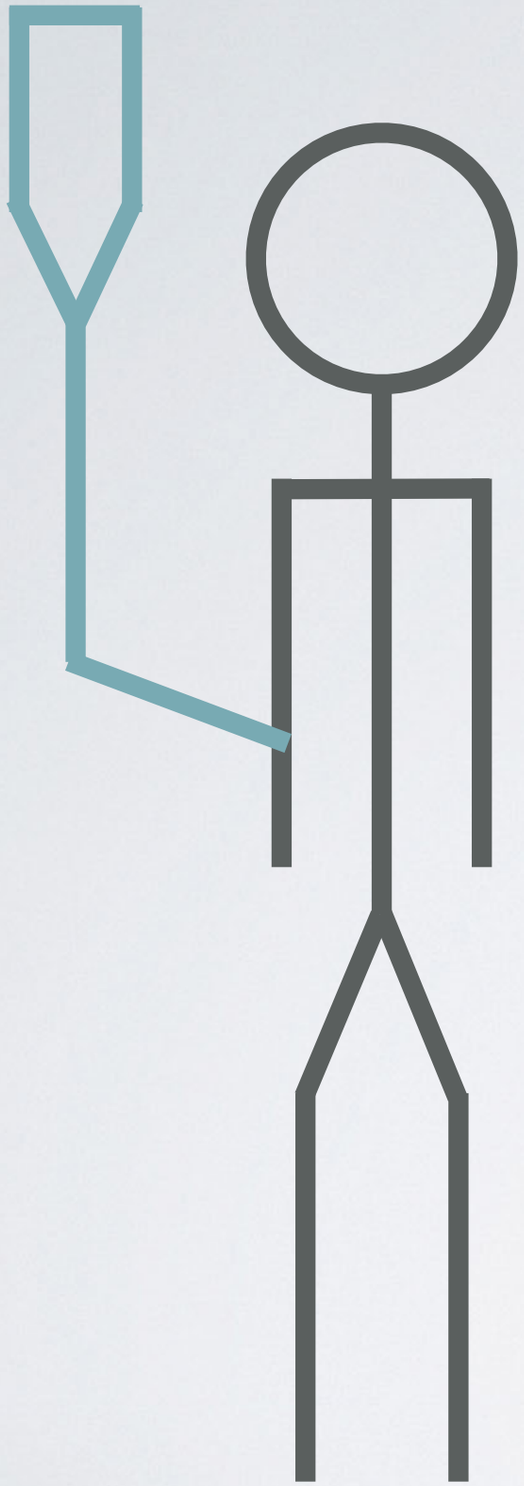
- apply a purpose-made pelvic binder,
  or
- consider an improvised pelvic binder, but only if a purpose-made binder does not fit.

Initial Management of Open Fractures Before Debridement



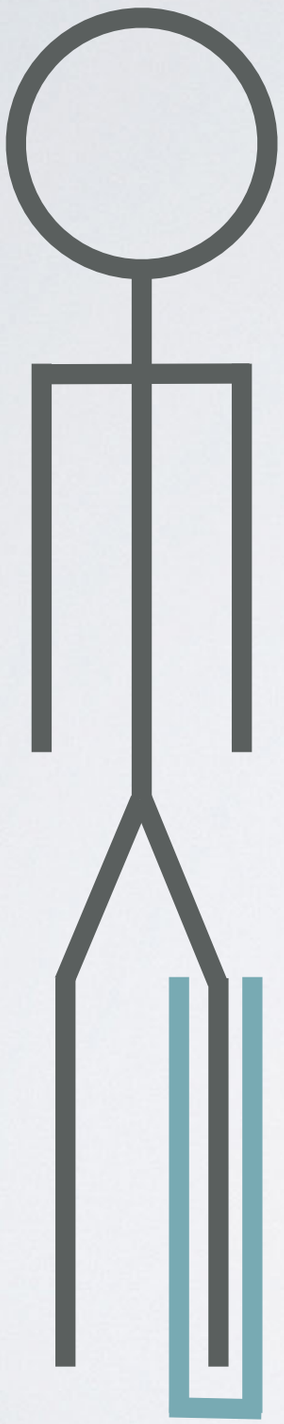
1.1.8
Do not irrigate open fractures of the long bones, hindfoot or midfoot in pre-hospital settings.

1.1.9
Consider a saline-soaked dressing covered with an occlusive layer for open fractures in pre-hospital settings.



1.1.10
In the pre-hospital setting, consider administering prophylactic intravenous antibiotics as soon as possible and preferably within 1 hour of injury to people with open fractures without delaying transport to hospital.

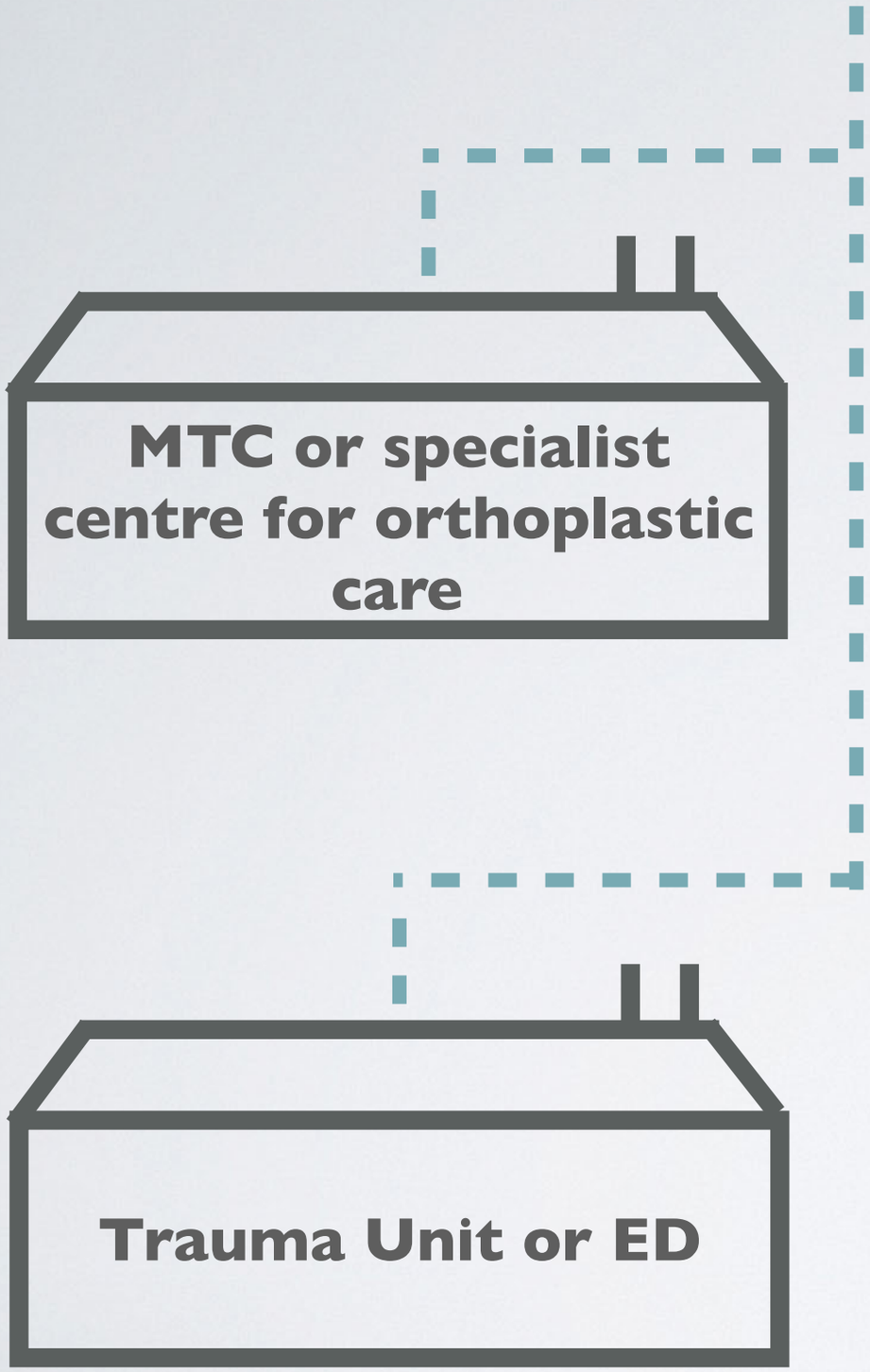
Splinting Long Bone Fractures in the Pre-Hospital Setting



1.1.11
In the pre-hospital setting, consider the following for people with suspected long bone fractures of the legs:

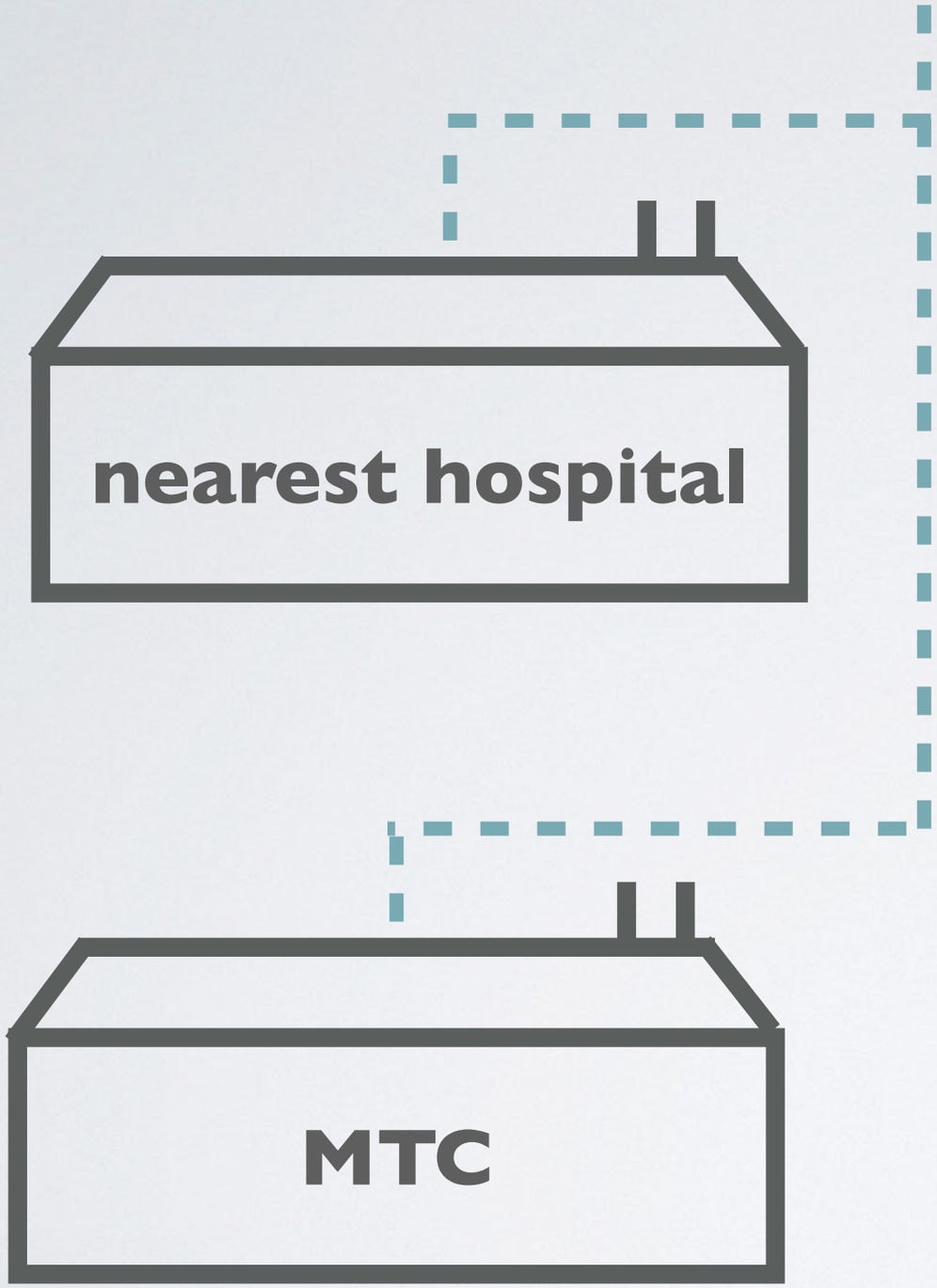
- a traction splint or adjacent leg as a splint if the suspected fracture is above the knee
- a vacuum splint for all other suspected long bone fractures.

Destination for People With Suspected Fractures



1.1.12 Transport people with suspected open fractures:

- directly to a major trauma centre[1] or specialist centre that can provide orthoplastic care if long bone, hindfoot or midfoot are involved, or
- to the nearest trauma unit or emergency department if the suspected fracture is in the hand, wrist or toes, unless there are pre-hospital triage indications for direct transport to a major trauma centre.



1.1.13
Transport people with suspected pelvic fractures:

- to the nearest hospital if suspected pelvic fracture is the only pre-hospital triage indication
- directly to a major trauma centre[1] if they also have other pre-hospital triage indications for major trauma.

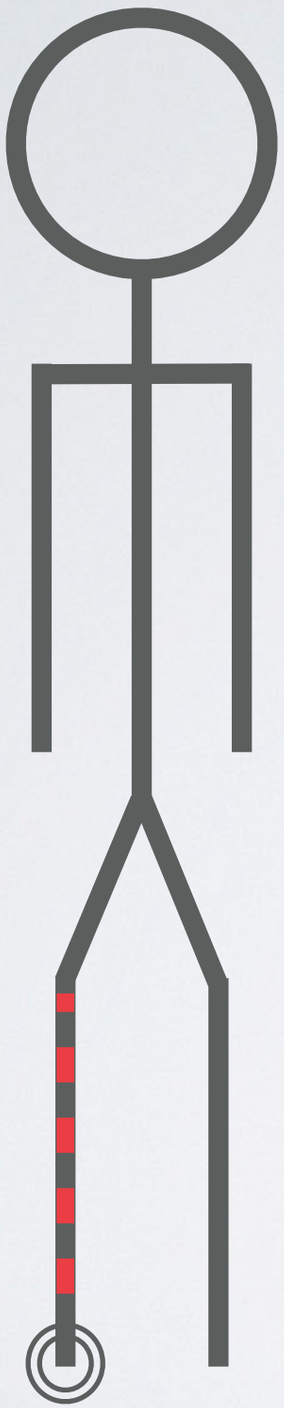
In some locations or circumstances, intermediate care in a trauma unit might be needed for urgent treatment, in line with agreed practice within the regional trauma network.

1.2 HOSPITAL SETTINGS

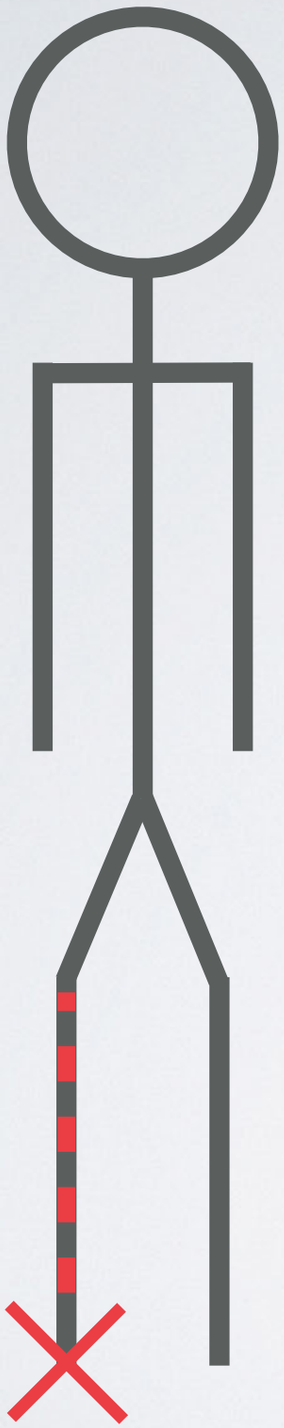
See recommendations 1.1.2 to 1.1.6 for advice on initial management of pain.

START

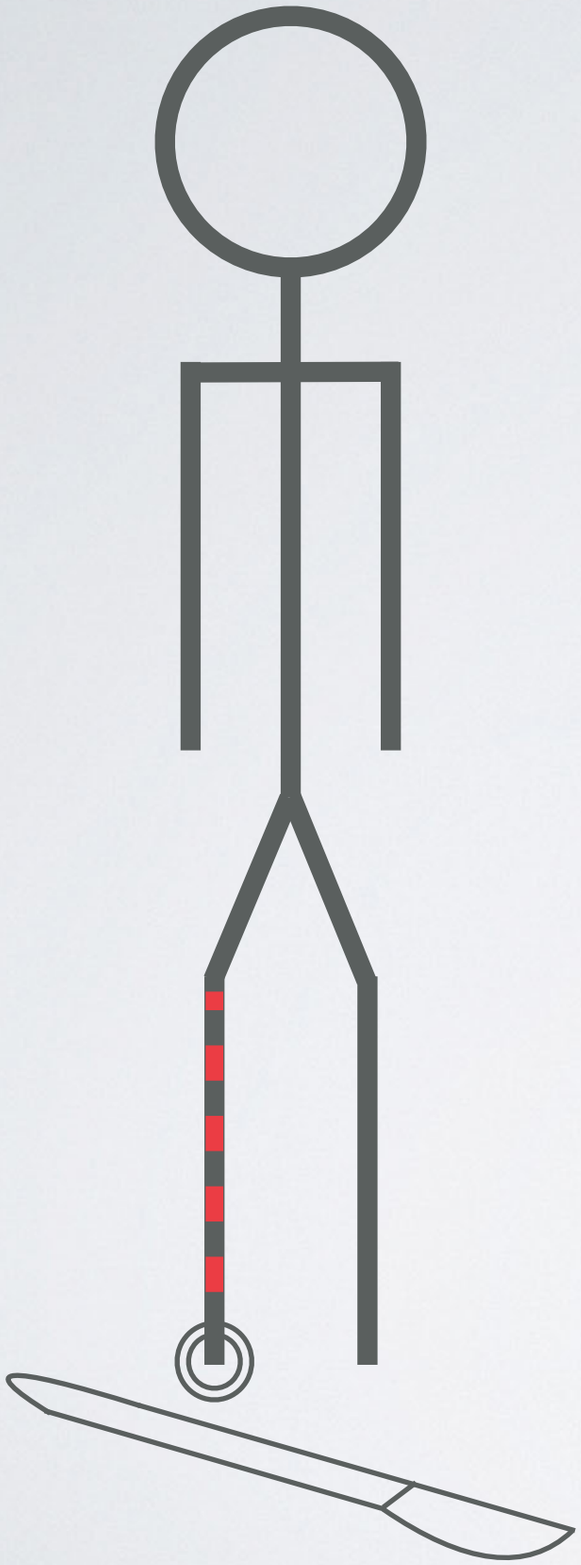
Vascular Injury



1.2.1
Use hard signs (lack of palpable pulse, continued blood loss, or expanding haematoma) to diagnose vascular injury.



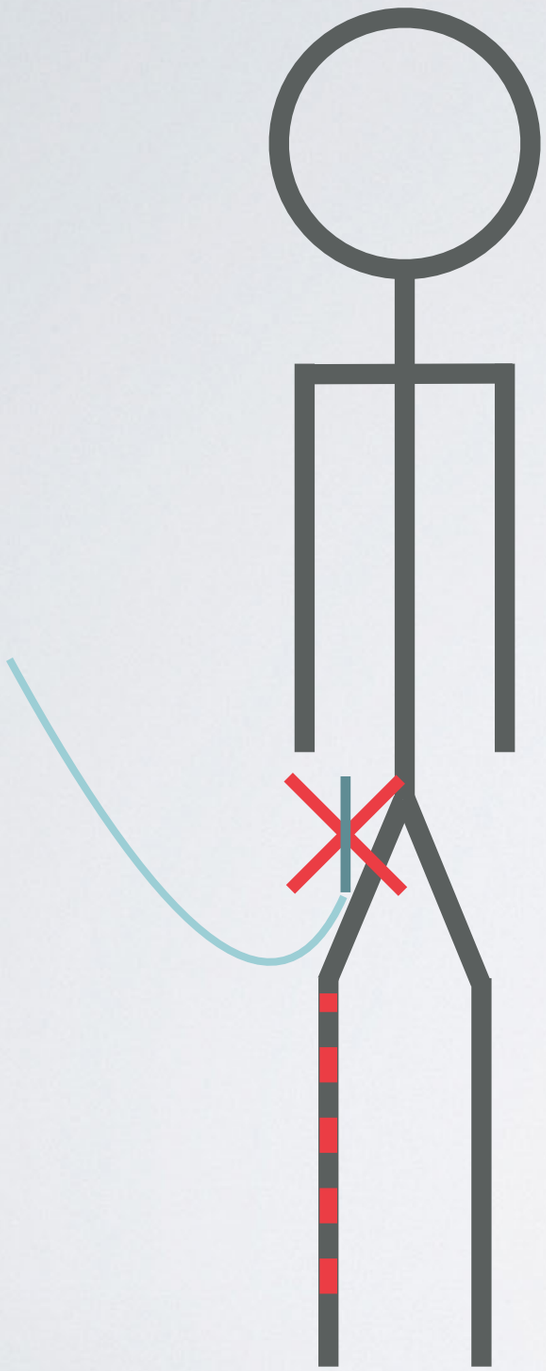
1.2.2
Do not rely on capillary return or Doppler signal to exclude vascular injury



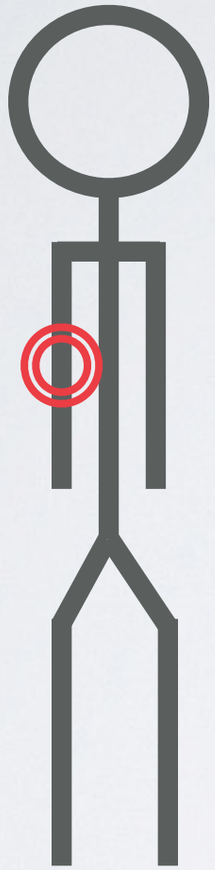
1.2.3
Perform immediate surgical exploration if hard signs of vascular injury persist after any necessary restoration of limb alignment and joint reduction.

1.2.4

In people with a devascularised limb following long bone fracture, use a vascular shunt as the first surgical intervention before skeletal stabilisation and definitive vascular reconstruction.



1.2.5
Do not delay revascularisation for angiography in people with complex fractures.



1.2.6
For humeral supracondylar fractures in children (under 16s) without a palpable radial pulse but with a well-perfused hand, consider observation rather than immediate vascular intervention.

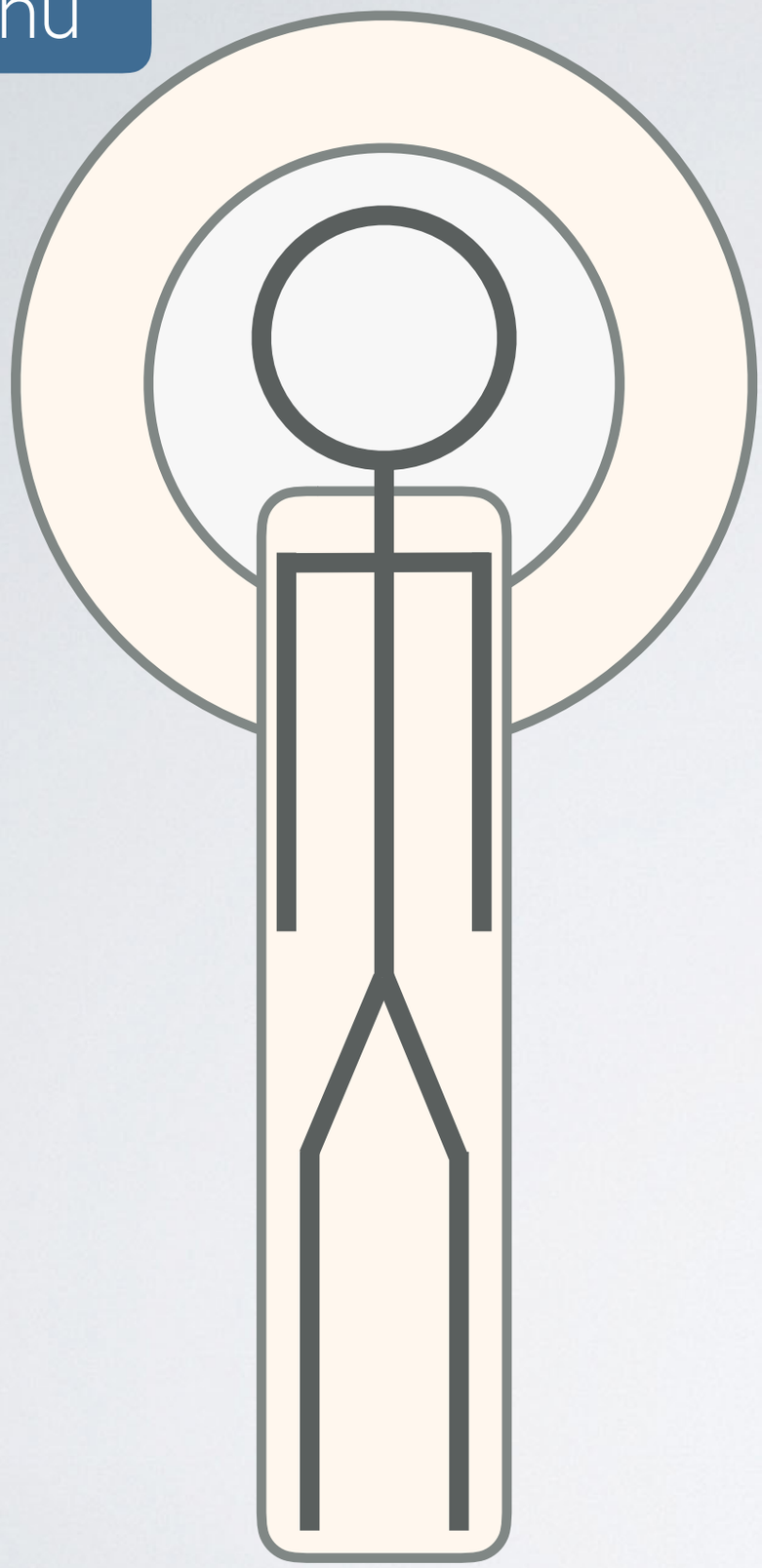
Compartment Syndrome

1.2.7

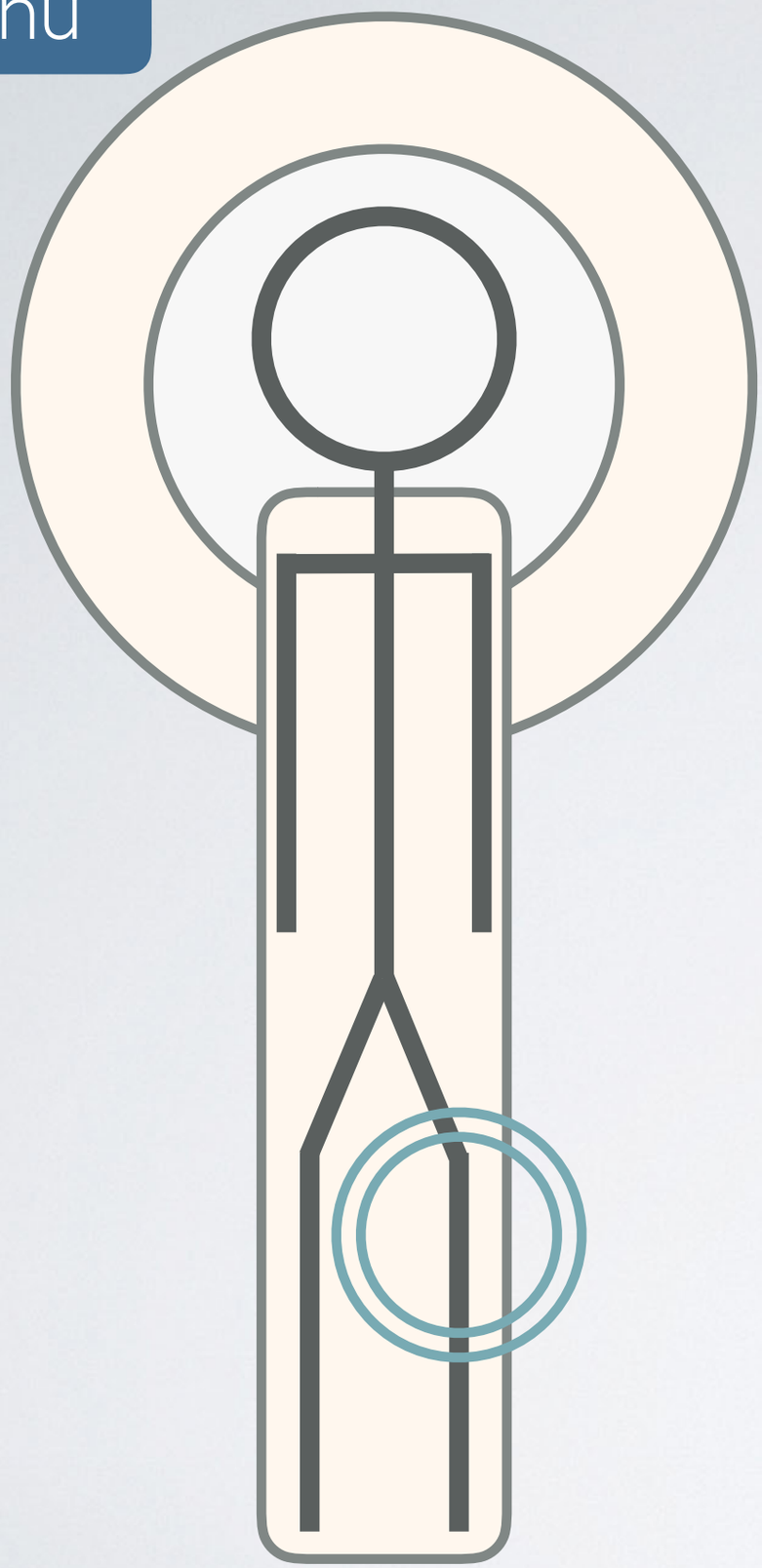
In people with fractures of the tibia, maintain awareness of compartment syndrome for 48 hours after injury or fixation by:

- regularly assessing and recording clinical symptoms and signs in hospital
- considering continuous compartment pressure monitoring in hospital when clinical symptoms and signs cannot be readily identified (for example, because the person is unconscious or has a nerve block)
- advising people how to self-monitor for symptoms of compartment syndrome, when they leave hospital.

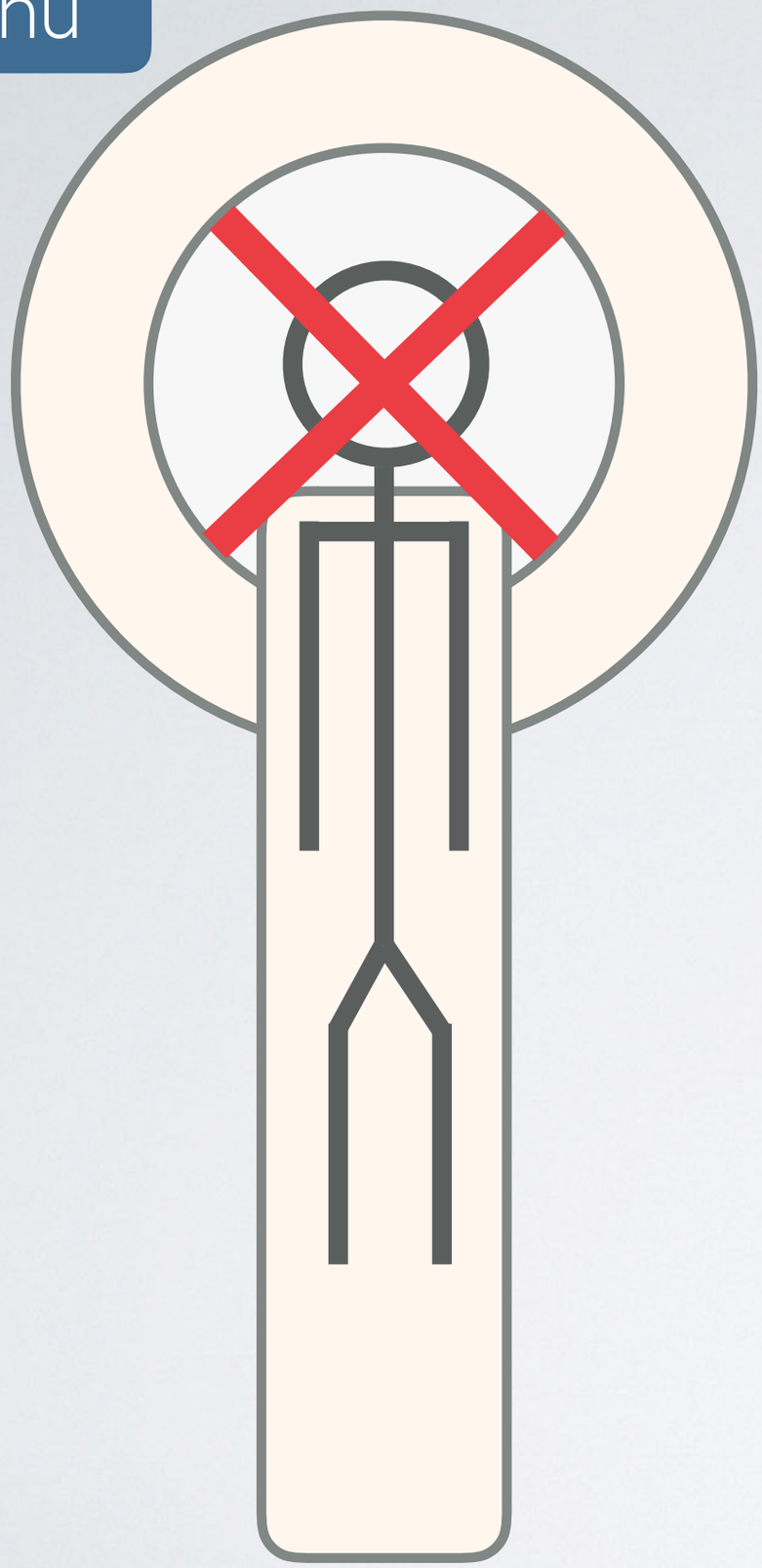
Whole-body CT of multiple injuries



1.2.8
Use whole body CT (consisting of a vertex-to-toes scanogram followed by a CT from vertex to mid-thigh) in adults (16 or over) with blunt major trauma and suspected multiple injuries. Patients should not be repositioned during the whole-body CT.



1.2.9
Use clinical findings and the scanogram to direct CT of the limbs in adults (16 or over) with limb trauma.



1.2.10
Do not routinely use whole-body CT to image children (under 16s). Use clinical judgement to limit CT to the body areas where assessment is needed.

Pelvic Fractures

Transfer to a major trauma centre or specialist centre

The NICE guideline on major trauma: service delivery contains a recommendation for ambulance and hospital trust boards, medical directors and senior managers on transfer between emergency departments.

NICE Guideline on major trauma: service delivery

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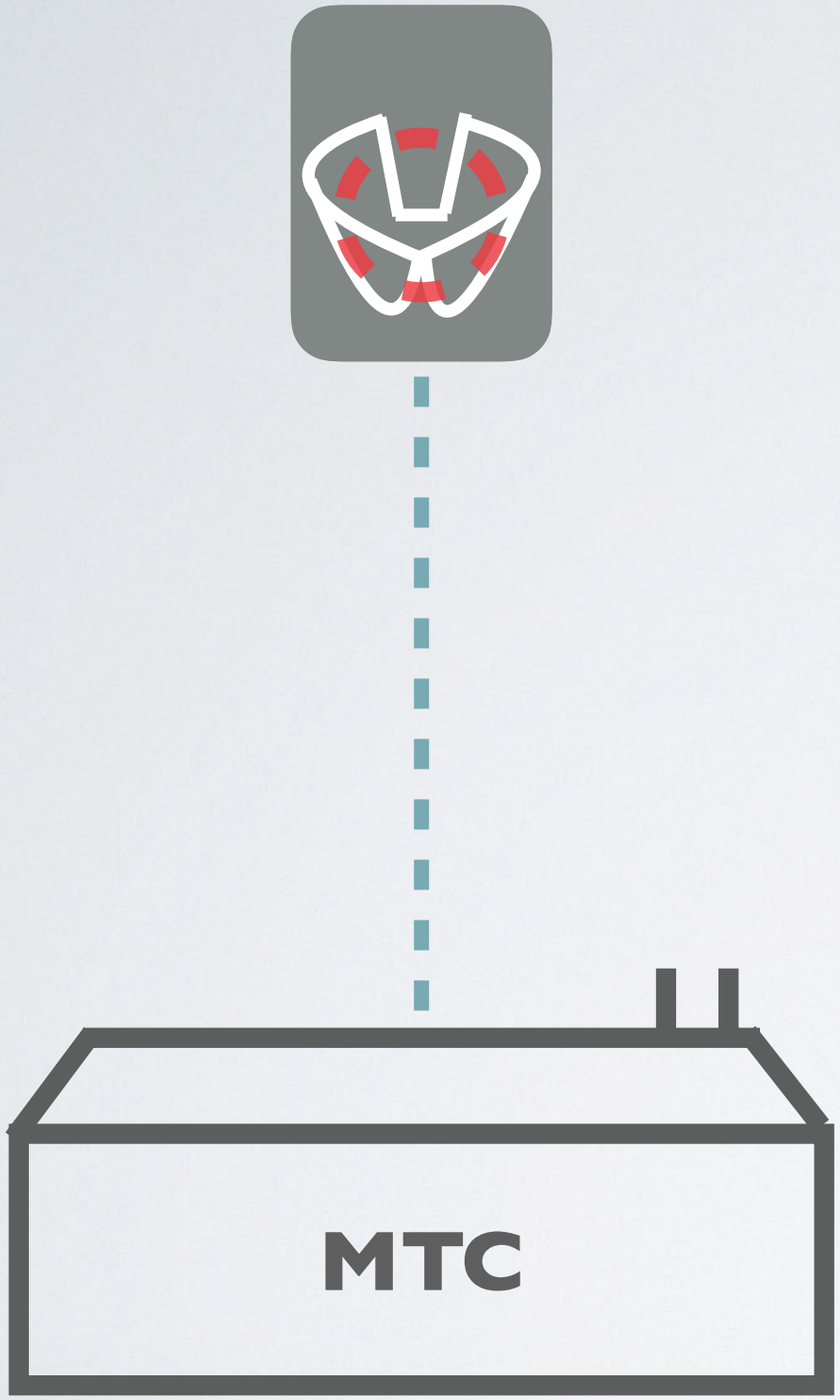
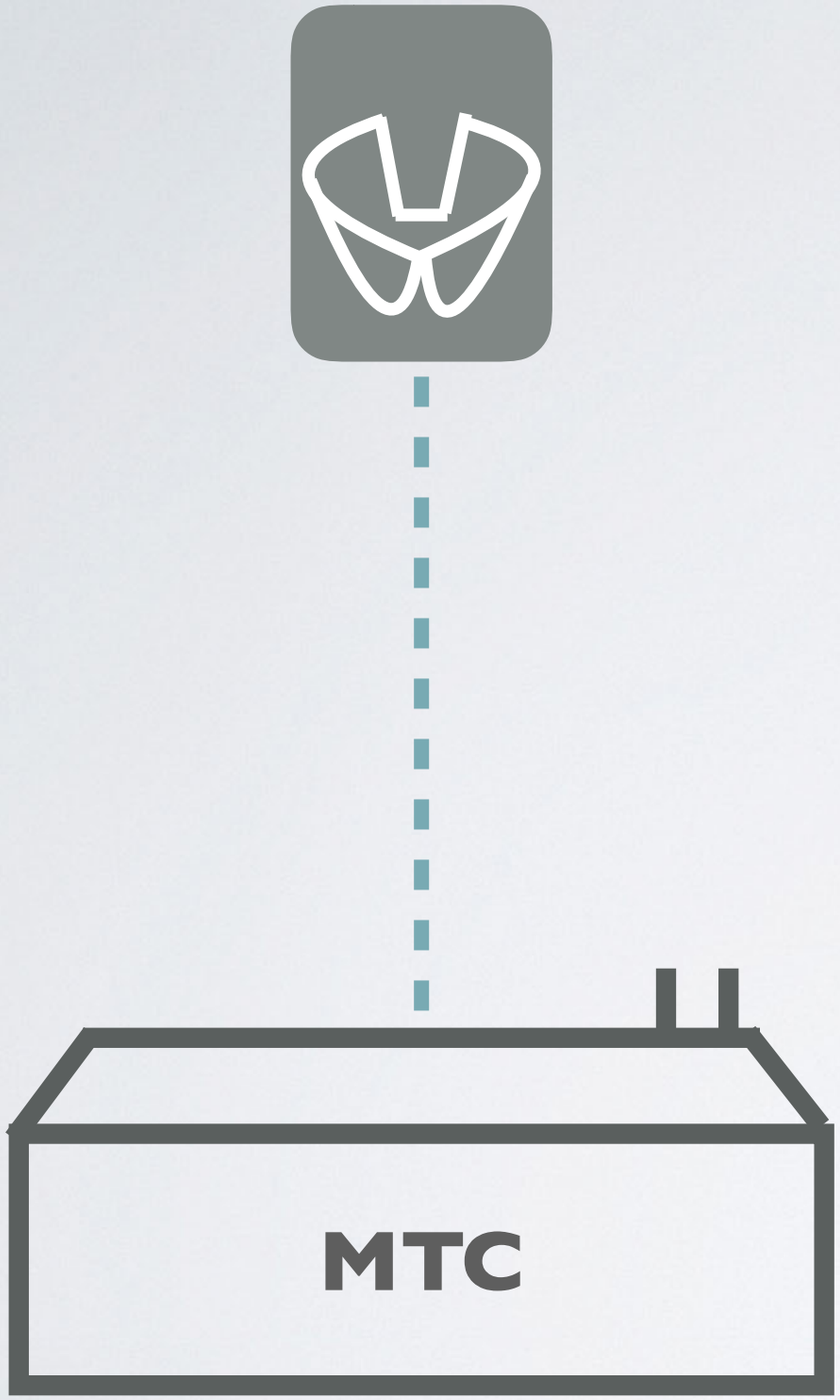
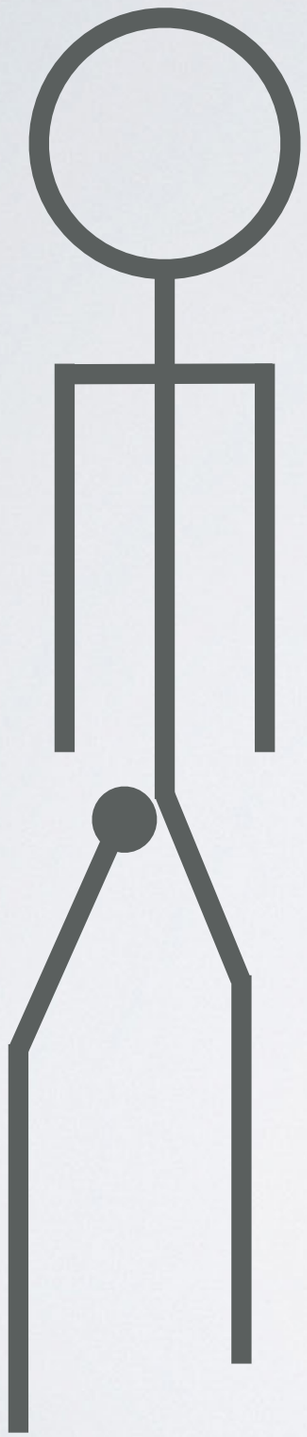


1.2.11
Immediately transfer people with haemodynamic instability from pelvic or acetabular fractures to a major trauma centre for definitive treatment of active bleeding.

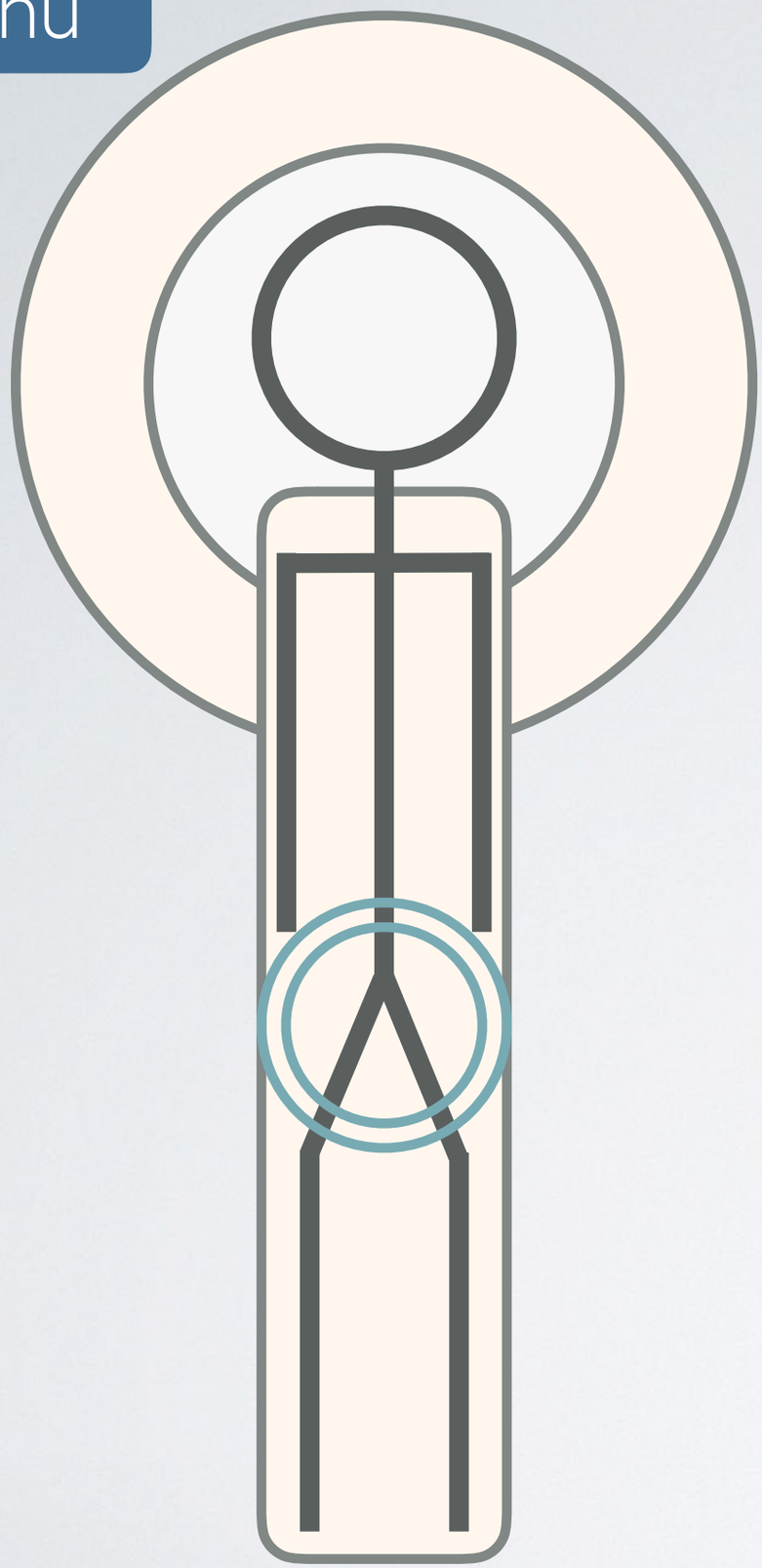


1.2.12
Transfer people with pelvic or acetabular fractures needing specialist pelvic reconstruction to a major trauma centre or specialist centre within 24 hours of injury.

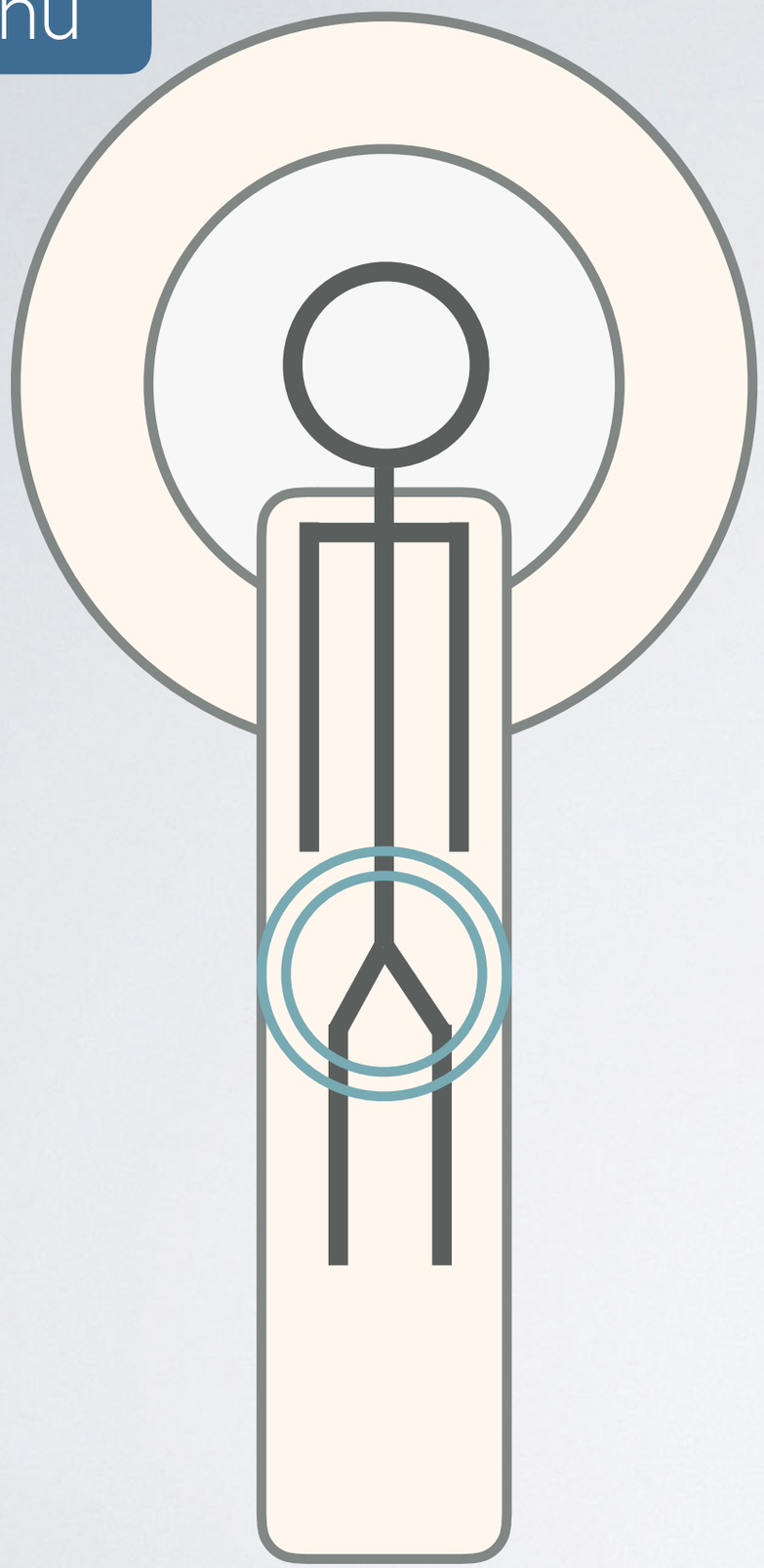


1.2.13
Immediately transfer people with a failed closed reduction of a native hip joint to a specialist centre if there is insufficient expertise for open reduction at the receiving hospital.

Pelvic imaging



1.2.14
Use CT for first-line imaging in adults (16 or over) with suspected high-energy pelvic fractures.



1.2.15

For first-line imaging in children (under 16s) with suspected high-energy pelvic fractures:

- use CT rather than X-ray when CT of the abdomen or pelvis is already indicated for assessing other injuries
- consider CT rather than X-ray when CT of the abdomen or pelvis is not indicated for assessing other injuries.

Use clinical judgement to limit CT to the body areas where assessment is needed.

Controlling pelvic haemorrhage

NICE Guideline on major trauma: service delivery

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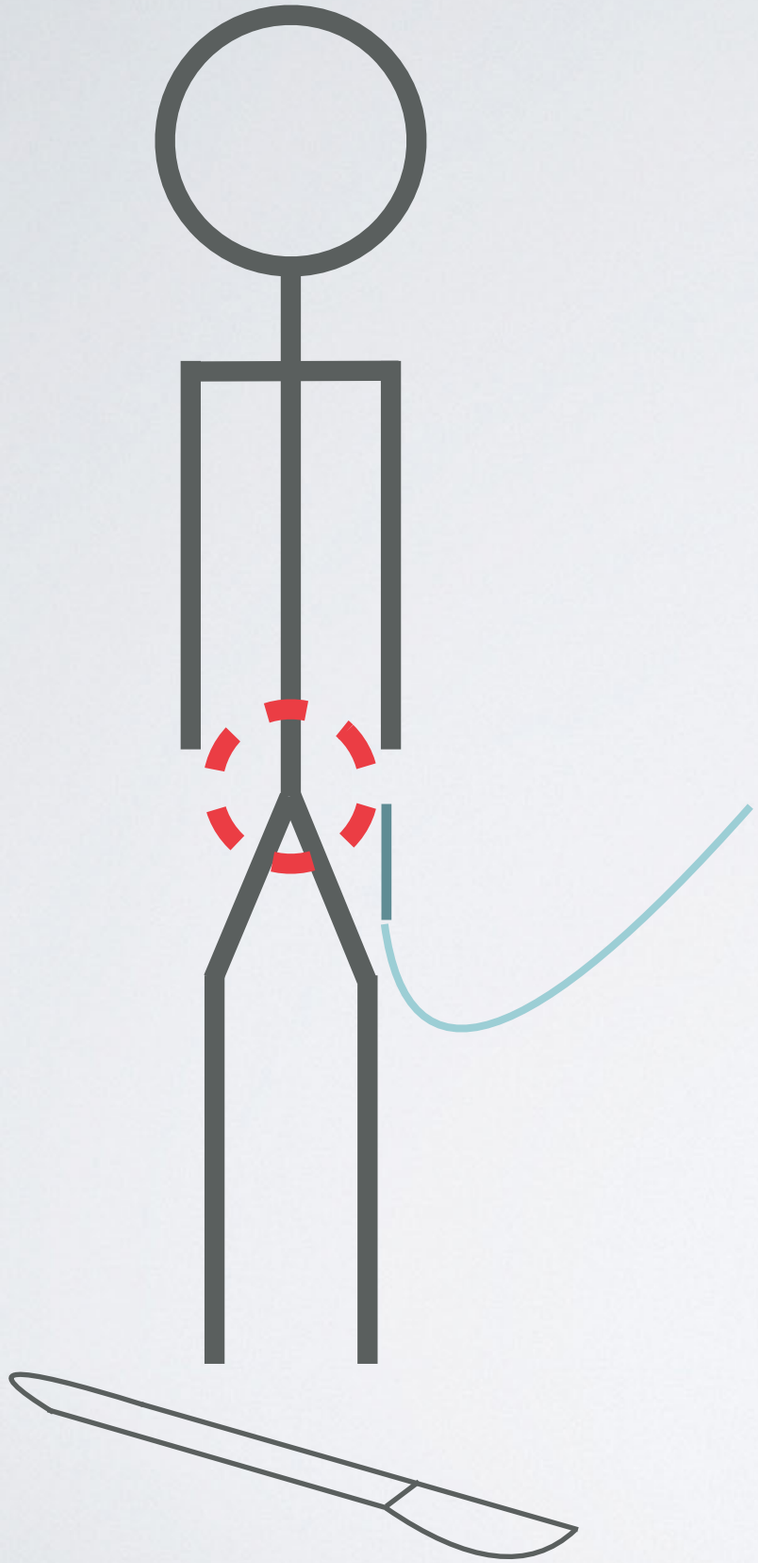
The NICE guideline on major trauma: service delivery contains a recommendation for ambulance and hospital trust boards, medical directors and senior managers on interventional radiology and definitive open surgery.



1.2.16

For first-line invasive treatment of active arterial pelvic bleeding, use:

- interventional radiology if emergency laparotomy is not needed for abdominal injuries
- pelvic packing if emergency laparotomy is needed for abdominal injuries.

Removing a pelvic binder

1.2.17

For people with suspected pelvic fractures and pelvic binders, remove the pelvic binder as soon as possible if

- there is no pelvic fracture, or
- a pelvic fracture is identified as mechanically stable, or
- the binder is not controlling the mechanical stability of the fracture, or
- there is no further bleeding or coagulation is normal.

Remove all pelvic binders within 24 hours of application.

1.2.18
Before removing the pelvic binder, agree with a pelvic surgeon how a mechanically unstable fracture should be managed.

Log rolling

1.2.19

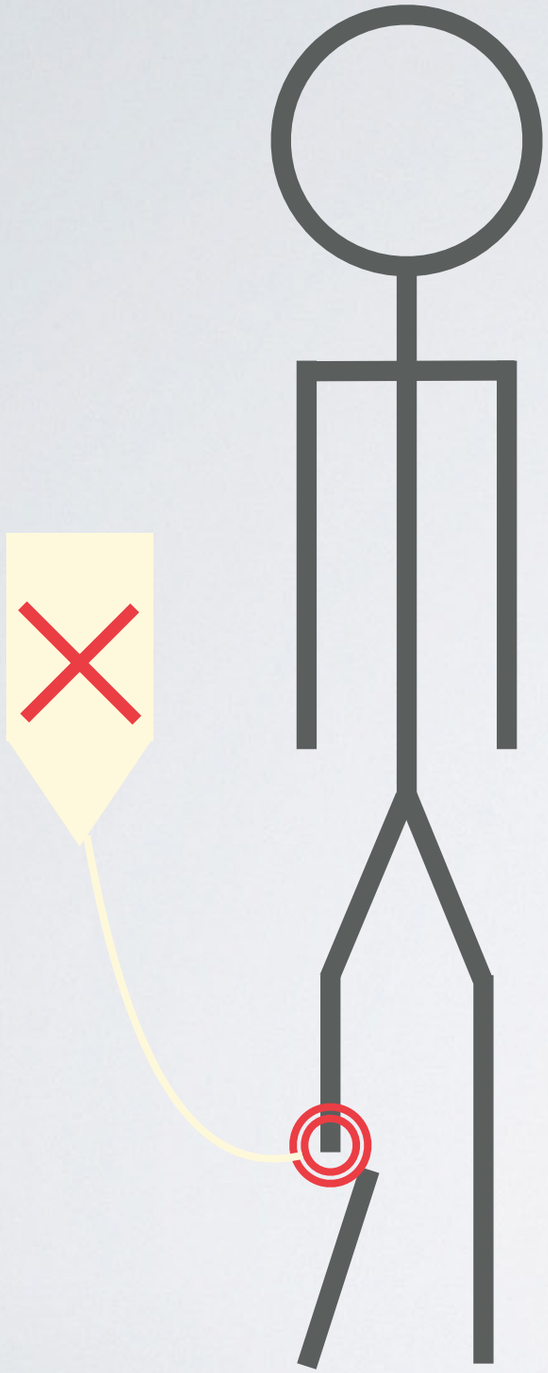
Do not log roll people with suspected pelvic fractures before pelvic imaging unless:

- an occult penetrating injury is suspected in a person with haemodynamic instability
- log rolling is needed to clear the airway (for example, suction is ineffective in a person who is vomiting).

When log rolling, pay particular attention to haemodynamic stability.

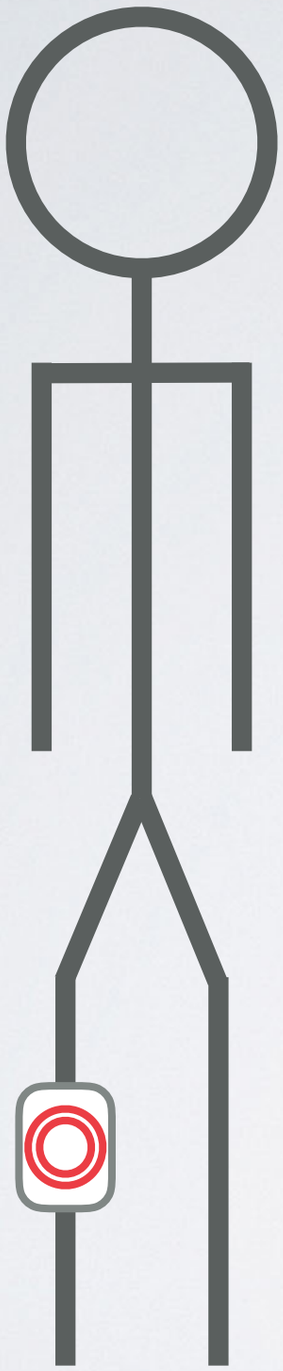
Open fractures

Management of open fractures before debridement

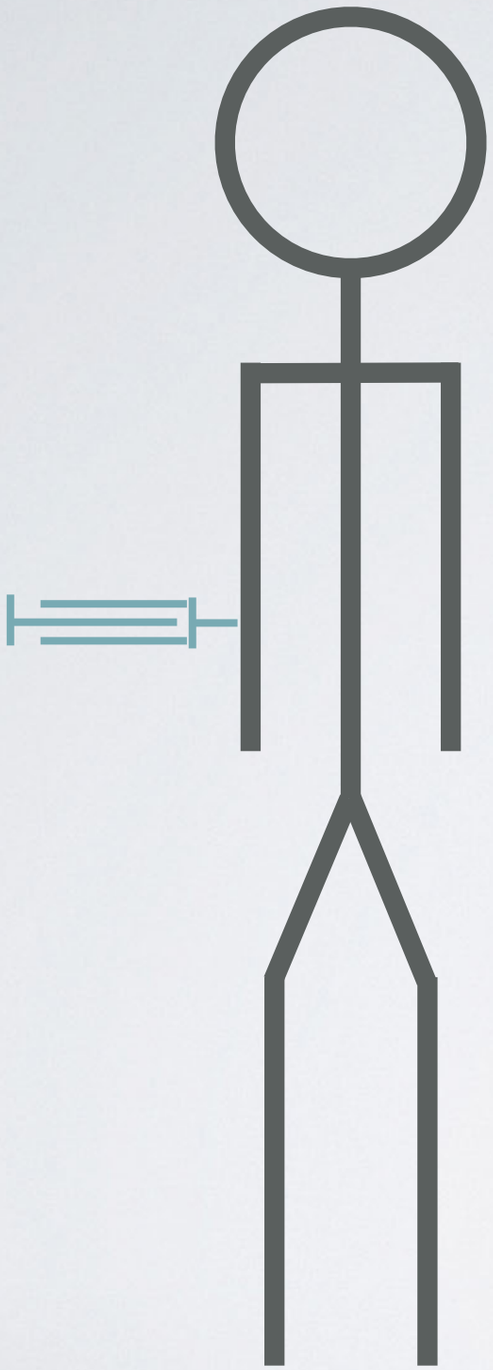


1.2.20

Do not irrigate open fractures of the long bones, hindfoot or midfoot in the emergency department before debridement.

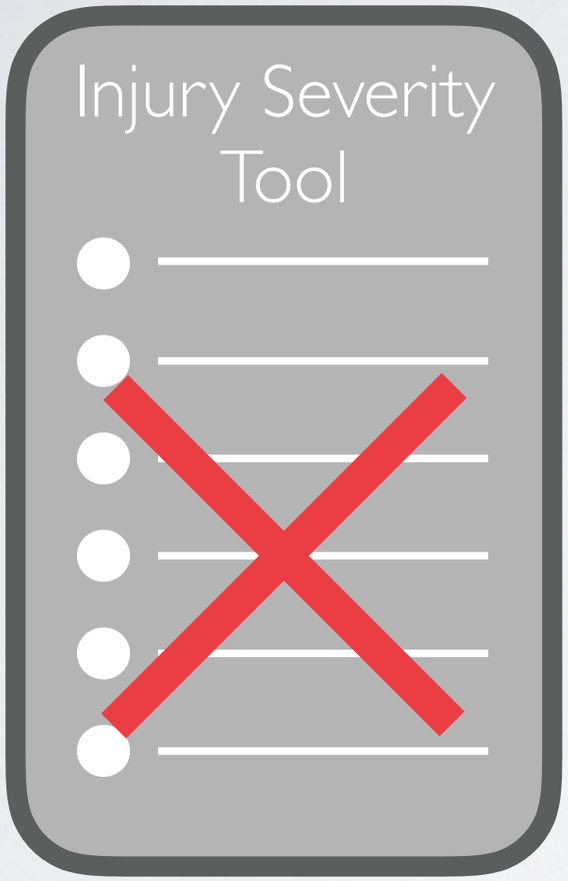


1.2.21
Consider a saline-soaked dressing covered with an occlusive layer (if not already applied) for open fractures in the emergency department before debridement.



1.2.22
In the emergency department, administer prophylactic intravenous antibiotics immediately to people with open fractures if not already given.

Limb salvage in people with open fractures



1.2.23
Do not base the decision whether to perform limb salvage or amputation on an injury severity tool score.

1.2.24
Perform emergency amputation when:

- a limb is the source of uncontrollable life-threatening bleeding, or
- a limb is salvageable but attempted preservation would pose an unacceptable risk to the person's life, or
- a limb is deemed unsalvageable after orthoplastic assessment.

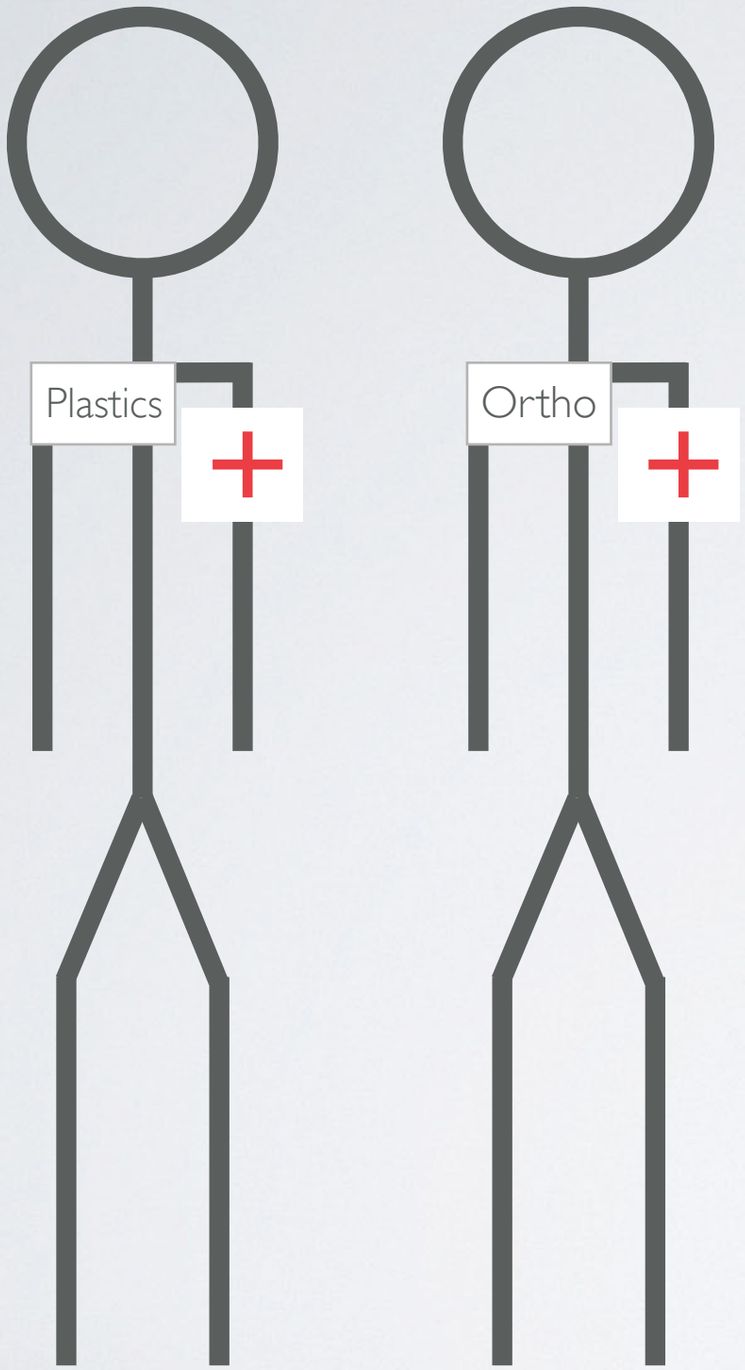
Include the person and their family members or carers (as appropriate) in a full discussion of the options if this is possible.

1.2.25

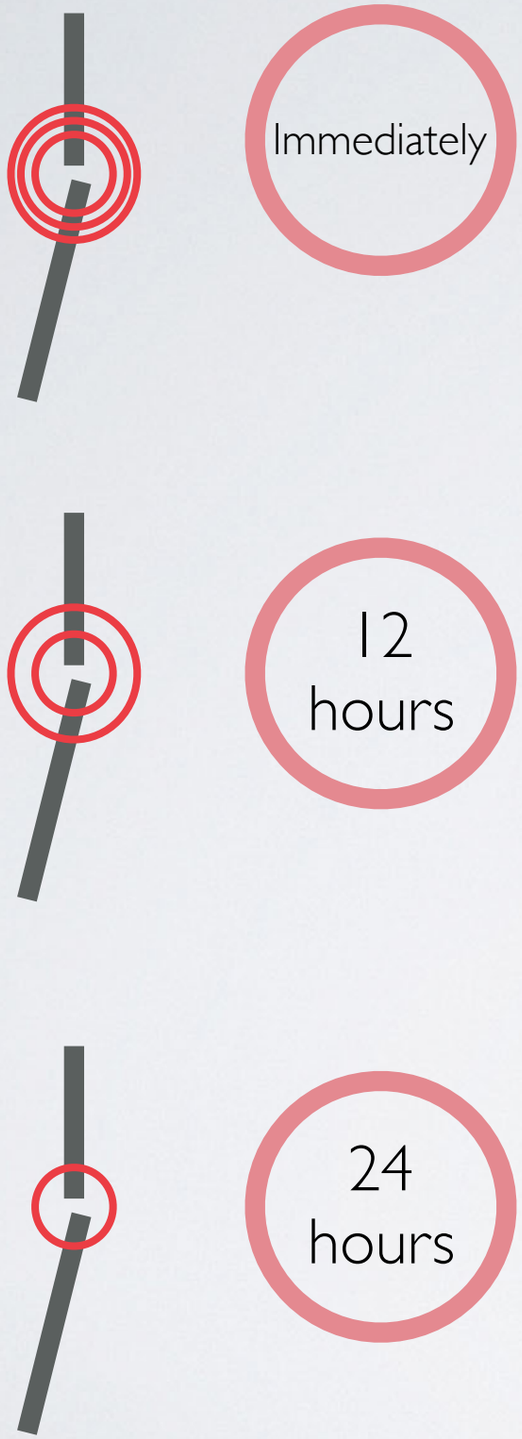
Base the decision whether to perform limb salvage or delayed primary amputation on multidisciplinary assessment involving an orthopaedic surgeon, a plastic surgeon, a rehabilitation specialist and the person and their family members or carers (as appropriate).

1.2.26
When indicated, perform the delayed primary amputation within 72 hours of injury.

Debridement, staging of fixation and cover



1.2.27
Surgery to achieve debridement, fixation and cover of open fractures of the long bone, hind foot or mid foot should be performed concurrently by consultants in orthopaedic and plastic surgery (a combined orthoplastic approach).



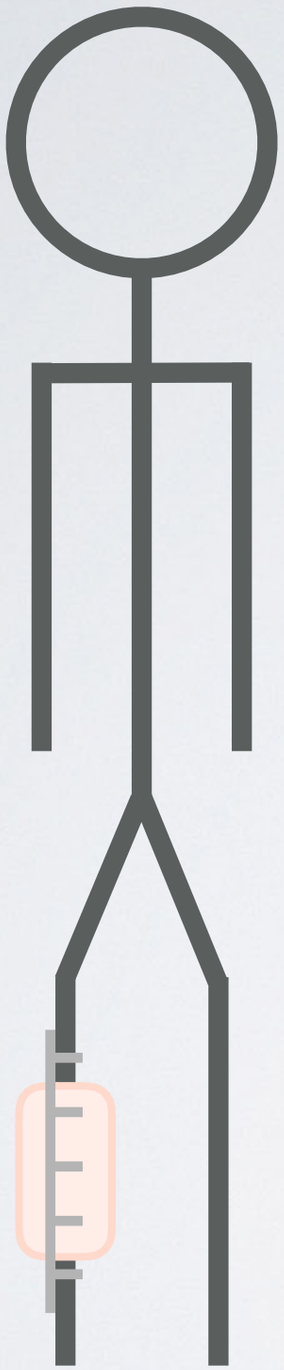
1.2.28

Perform debridement:

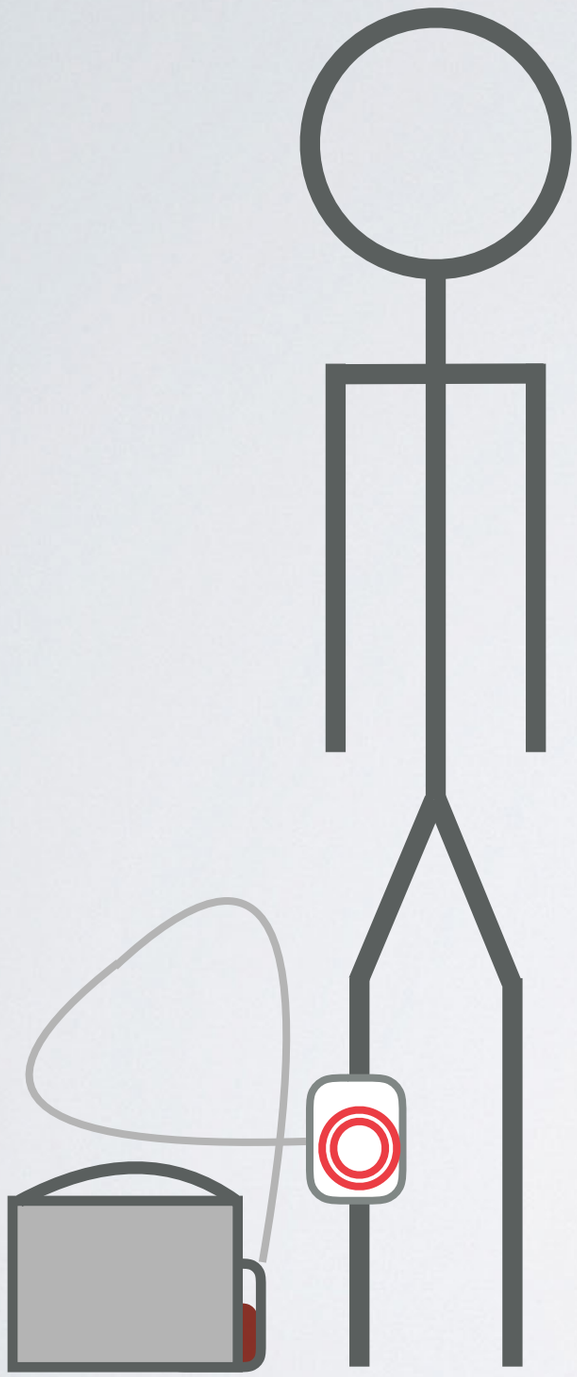
- immediately for highly contaminated open fractures
- within 12 hours of injury for high-energy open fractures (likely Gustilo-Anderson classification type IIIA or type IIIB) that are not highly contaminated
- within 24 hours of injury for all other open fractures.

1.2.29
Perform fixation and definitive soft tissue cover:

- at the same time as debridement if the next orthoplastic list allows this within the time to debridement recommended in 1.2.28, or
- within 72 hours of injury if definitive soft tissue cover cannot be performed at the time of debridement.

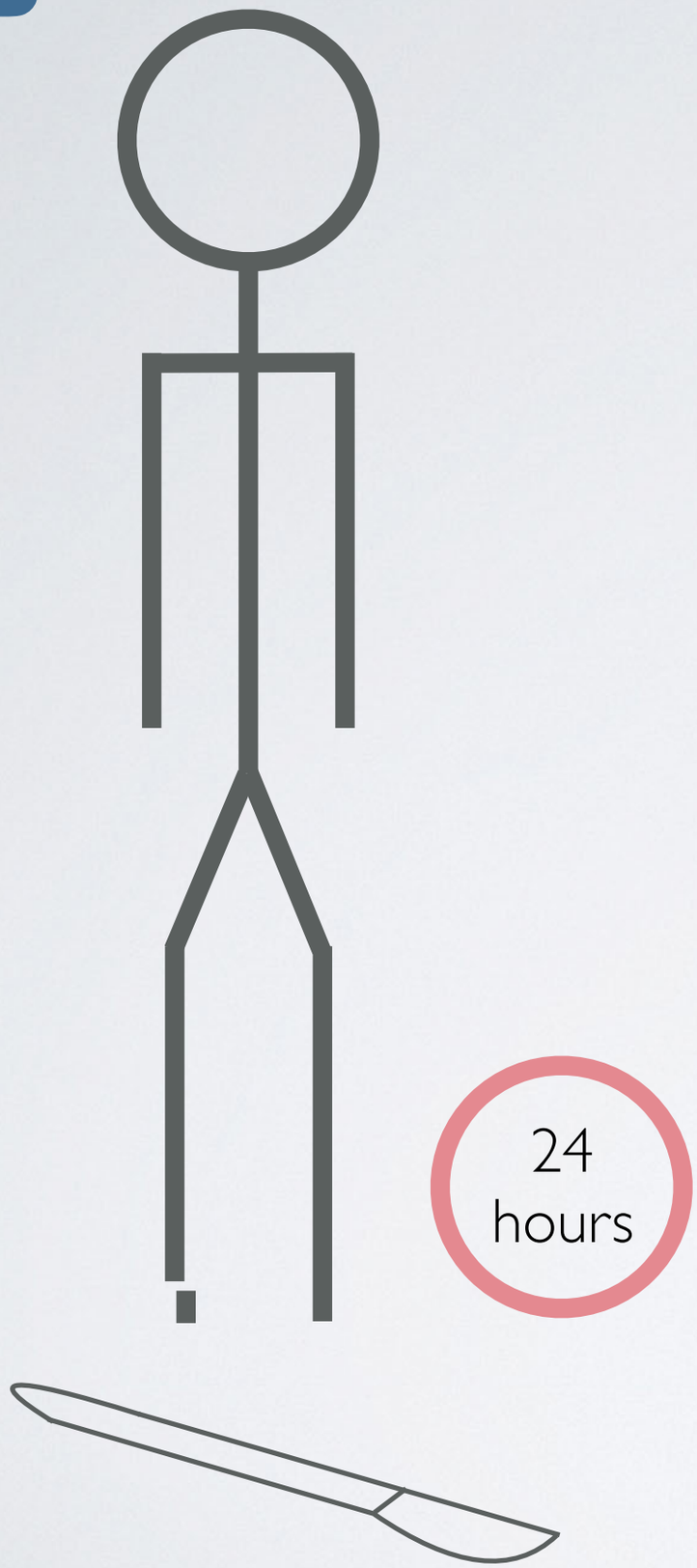


1.2.30
When internal fixation is used, perform definitive soft tissue cover at the same time.

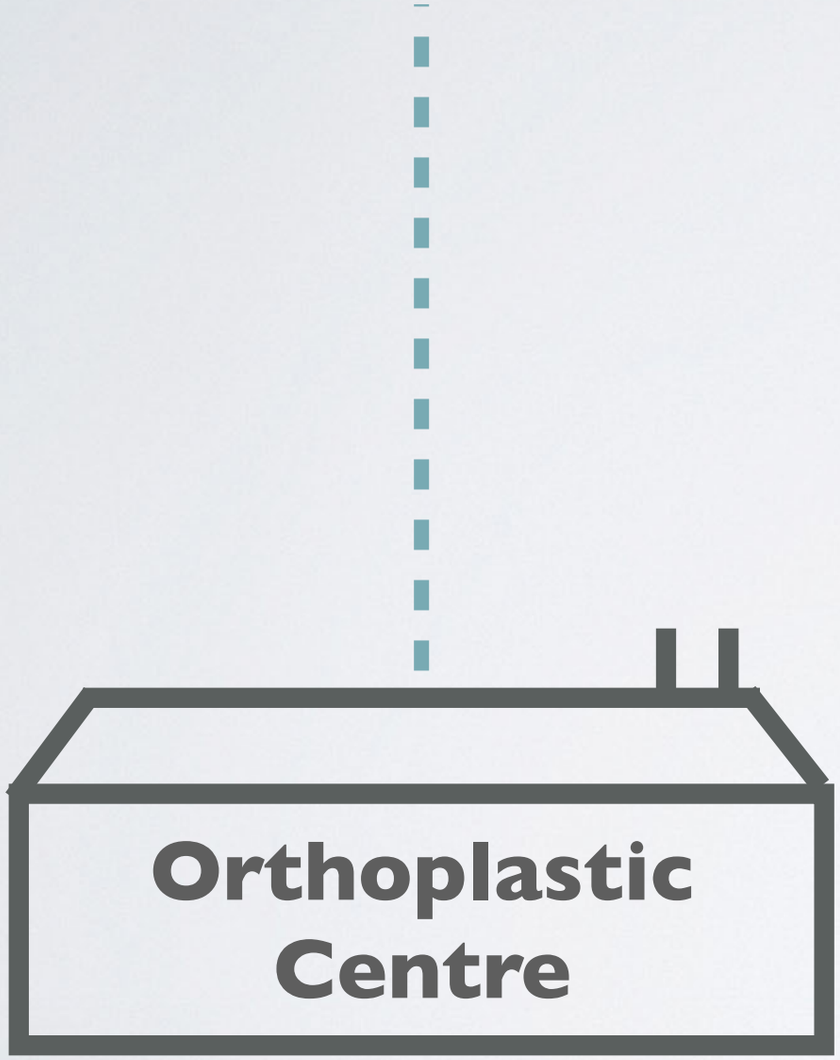


1.2.31
Consider negative pressure wound therapy after debridement if immediate definitive soft tissue cover has not been performed.

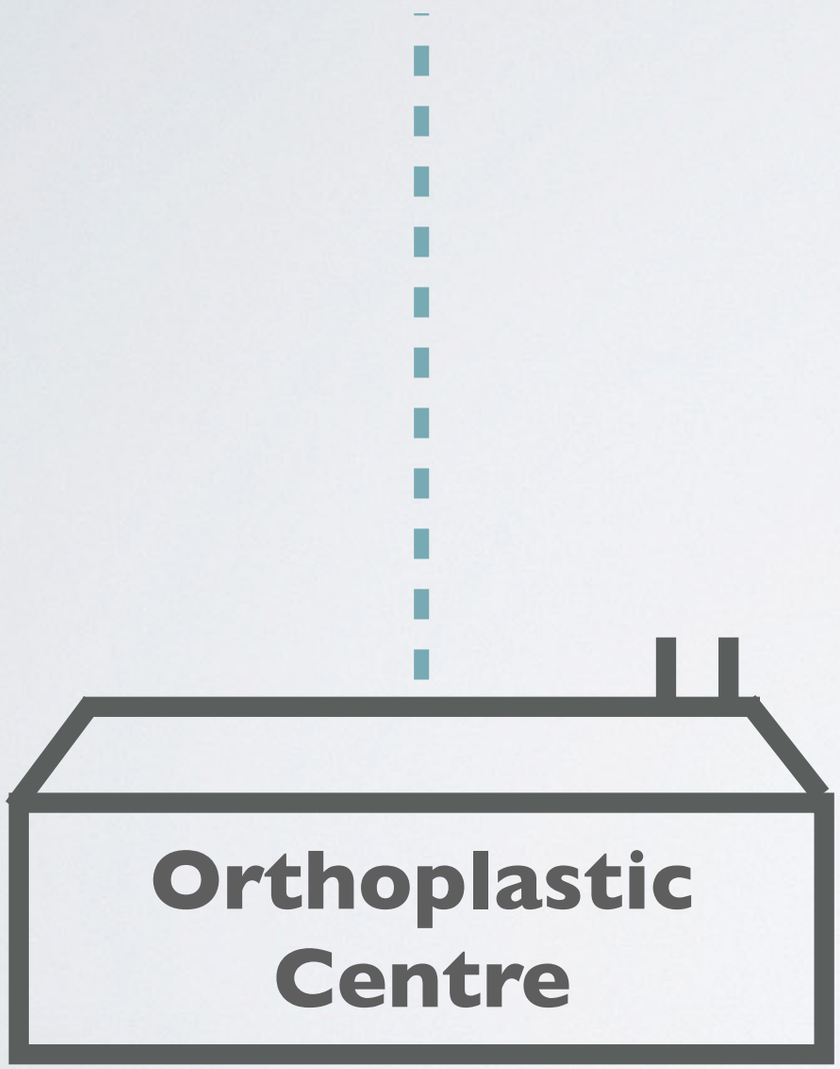
Pilon fractures in adults (skeletally mature)



1.2.32
Create a definitive management plan and perform surgery (temporary or definitive) within 24 hours of injury in adults (skeletally mature) with displaced pilon fractures.



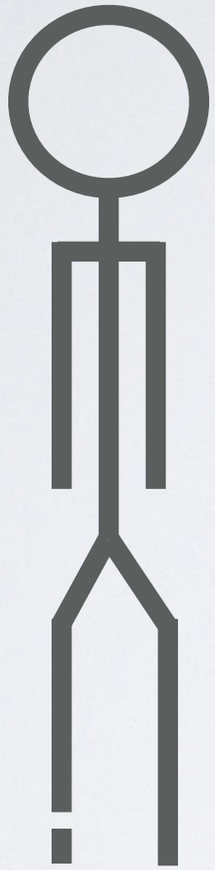
1.2.33
If a definitive management plan and initial surgery cannot be performed at the receiving hospital within 24 hours of injury, transfer adults (skeletally mature) with displaced pilon fractures to an orthoplastic centre (ideally this would be emergency department to emergency department transfer to avoid delay).



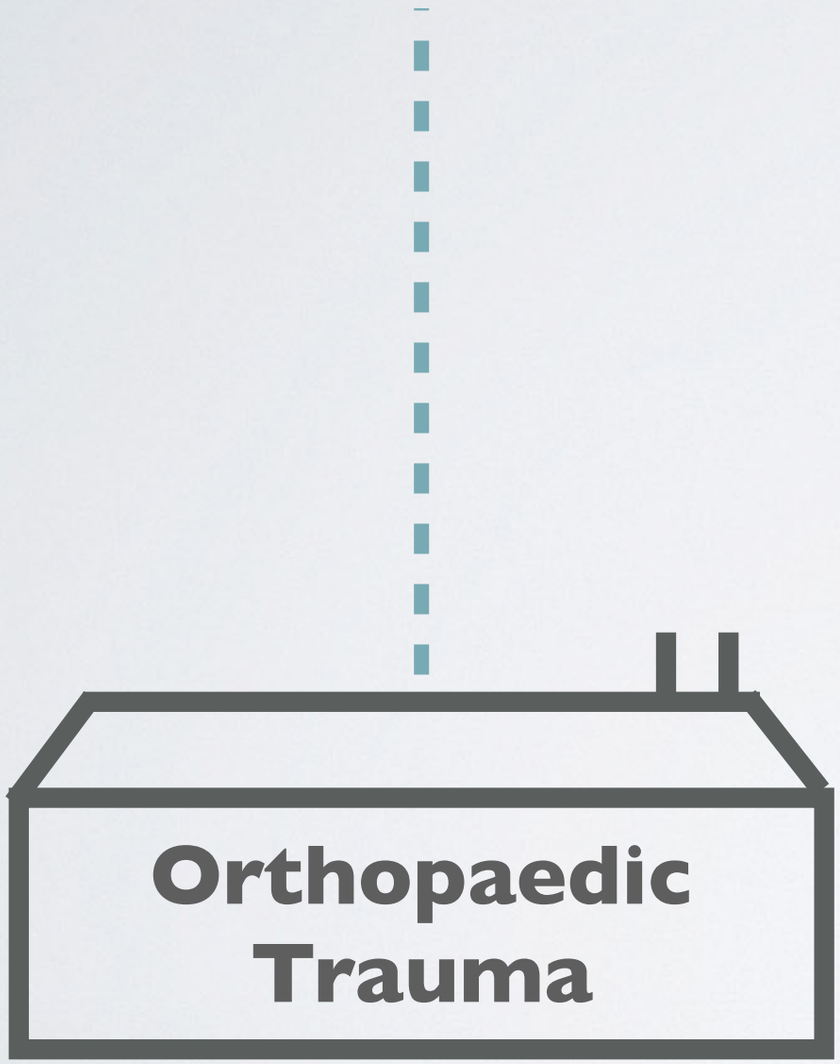
1.2.34
Immediately transfer adults (skeletally mature) with displaced pilon fractures to an orthoplastic centre if there are wound complications.

Intra-articular distal tibia fractures in children (skeletally immature)

24 hours



1.2.35
Create a definitive management plan involving a children's orthoplastic trauma specialist within 24 hours of diagnosis in children (skeletally immature) with intra-articular distal tibia fractures.



1.2.36
If a definitive management plan and surgery cannot be performed at the receiving hospital, transfer children (skeletally immature) with intra-articular distal tibia fractures to a centre with a children's orthopaedic trauma specialist (ideally this would be emergency department to emergency department transfer to avoid delay).

1.3 DOCUMENTATION

START

NICE Guideline on major trauma: service delivery

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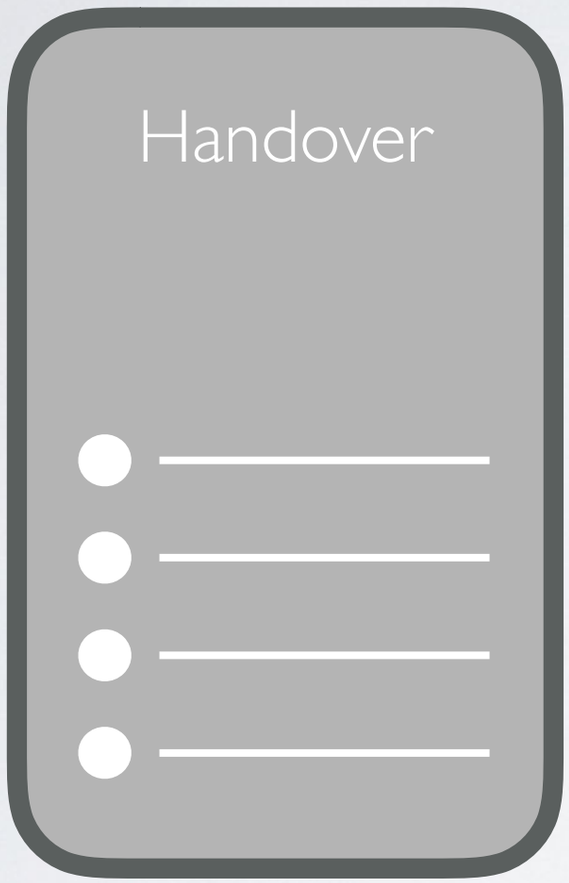
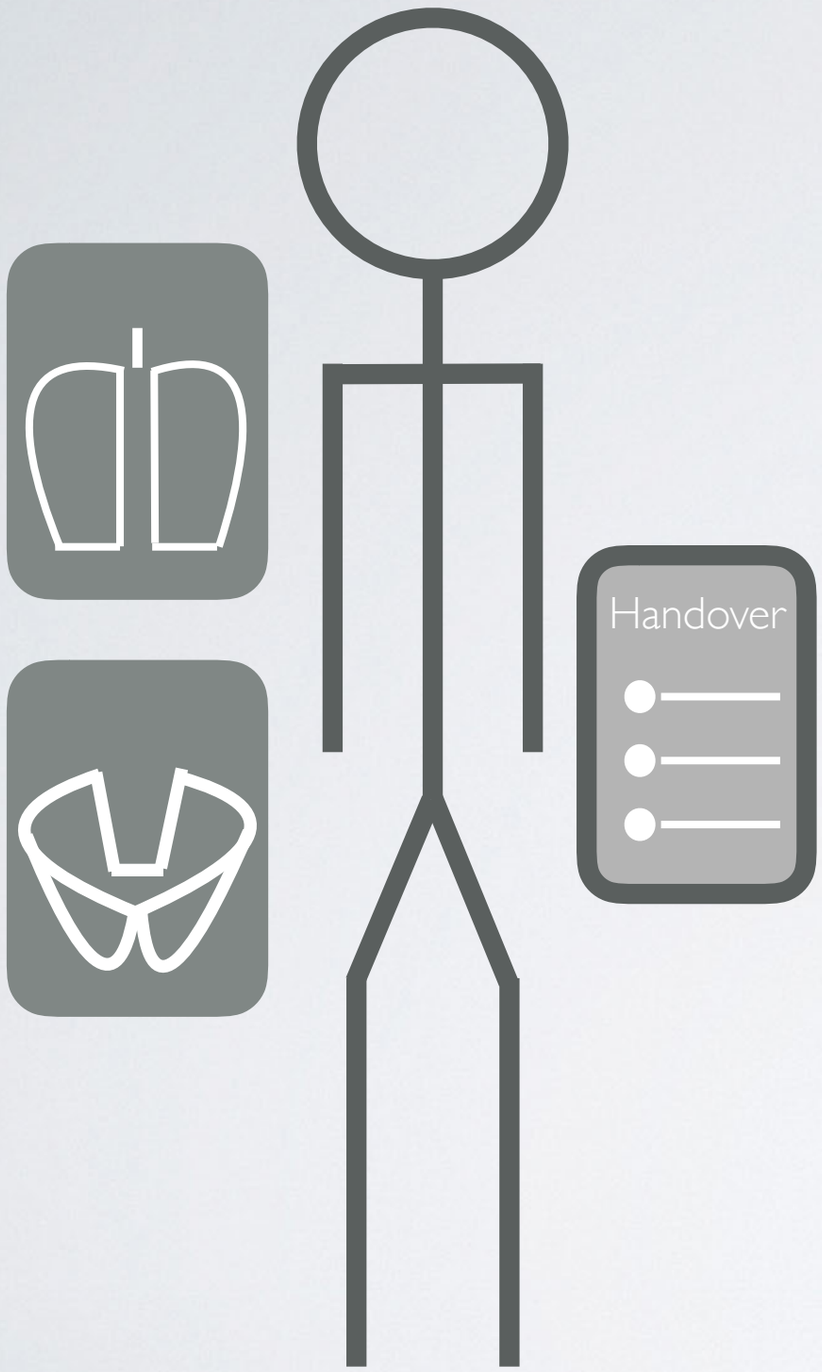
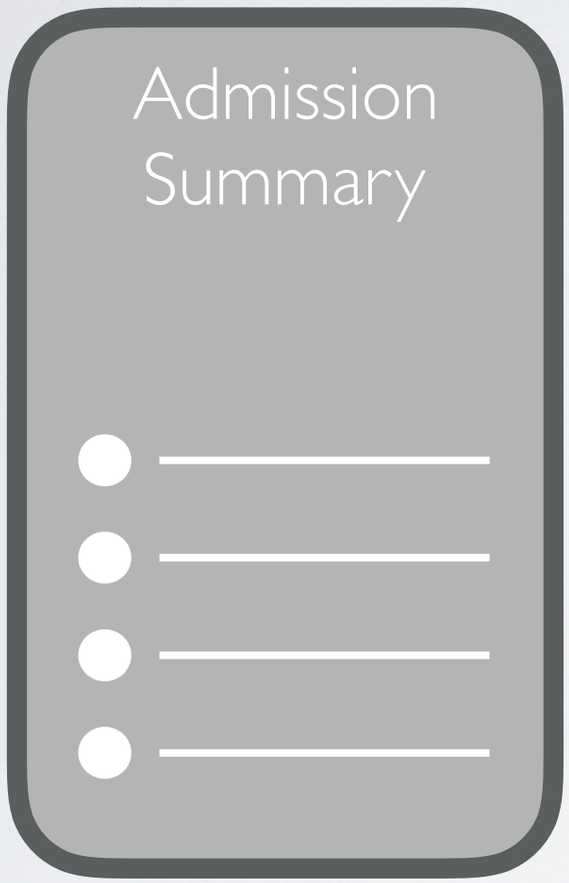
The NICE guideline on major trauma: service delivery contains recommendations for ambulance and hospital trust boards, senior managers and commissioners on documentation within a trauma network.



1.3.1
Follow a structured process when handing over care within the emergency department (including shift changes) and to other departments. Ensure that the handover is documented.



1.3.2
Ensure that all patient documentation, including images and reports, goes with patients when they are transferred to other departments or centres.



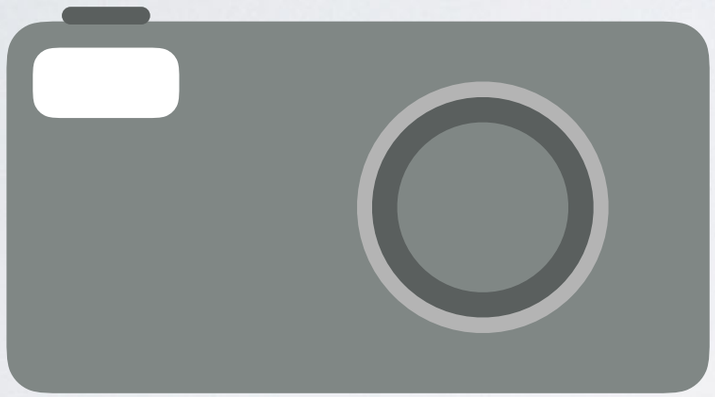
1.3.3
Produce a written summary, which gives the diagnosis, management plan and expected outcome, and:

- is aimed at and sent to the patient's GP within 24 hours of admission
- includes a summary written in plain English that is understandable by patients, family members and carers
- is readily available in the patient's records.

Photographic documentation of open fracture wounds

1.3.4

All trusts receiving patients with open fractures must have information governance policies in place that enable staff to take and use photographs of open fracture wounds for clinical decision-making 24 hours a day. Protocols must also cover the handling and storage of photographic images of open fracture wounds.



1.3.5
Consider photographing open fracture wounds when they are first exposed for clinical care, before debridement and at other key stages of management.

1.3.6
Keep any photographs of open fracture wounds in the patient's records.

Documentation of neurovascular status

1.3.7

When assessing neurovascular status in a person with a limb injury, document for both limbs:

- which nerves and nerve function have been assessed and when
- the findings, including:
  - sensibility
  - motor function using the Medical Research Council (MRC) grading system
- which pulses have been assessed and when
- how circulation has been assessed when pulses are not accessible.

Document and time each repeated assessment.

1.4 INFORMATION AND SUPPORT FOR PATIENTS, FAMILY MEMBERS AND CARERS

START

NICE Guideline on major trauma: service delivery

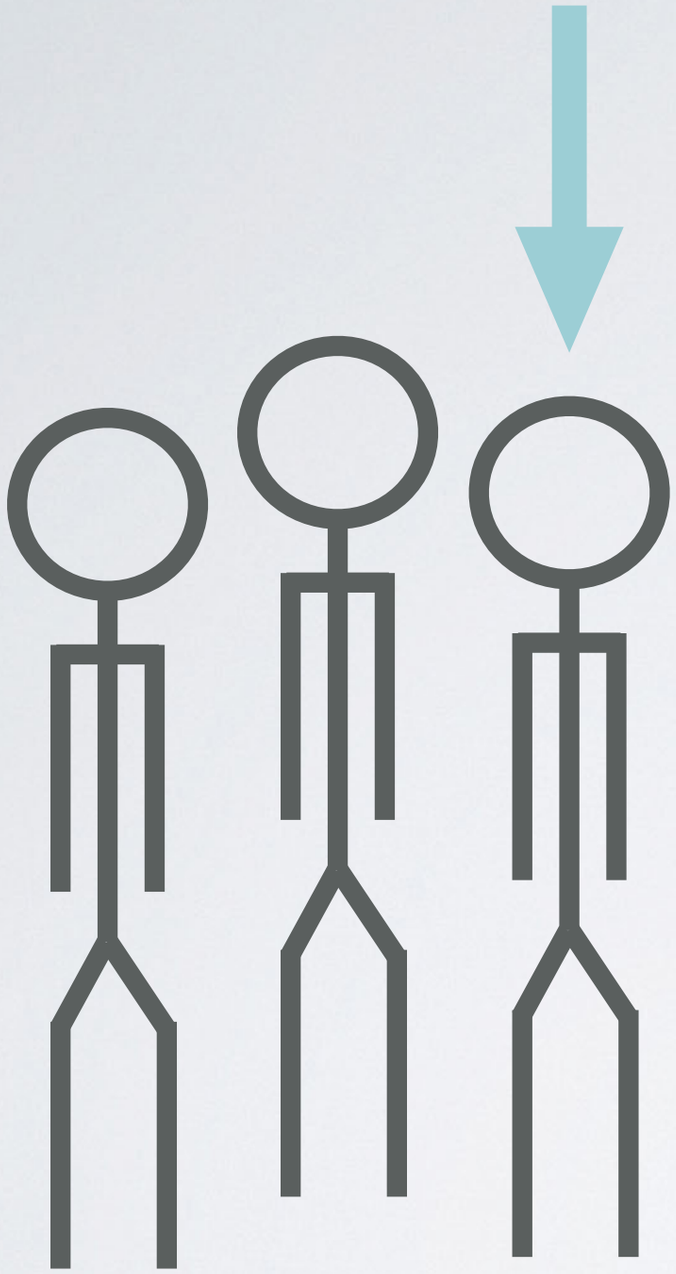
- .....
- .....
- .....
- .....
- .....

The NICE guideline on major trauma: service delivery contains recommendations for ambulance and hospital trust boards, senior managers and commissioners on support and information for patients, family members and carers.

Providing support

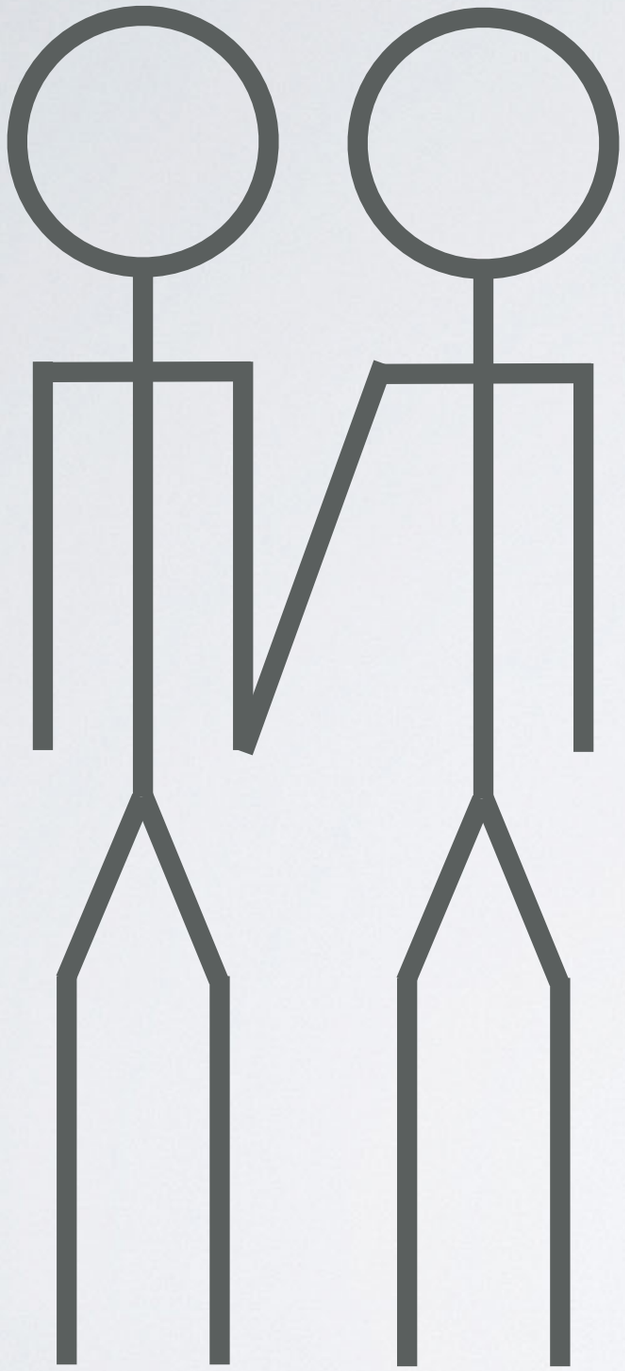
1.4.1
When communicating with patients, family members and carers:

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

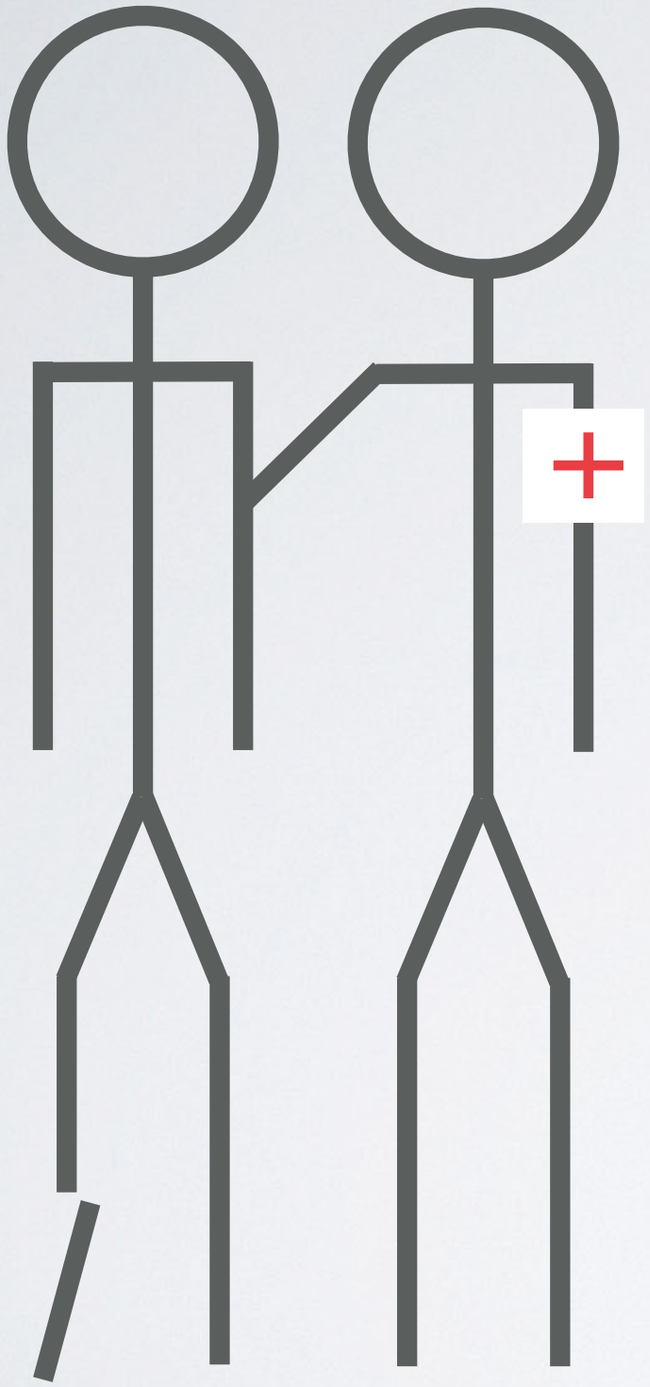


1.4.2

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

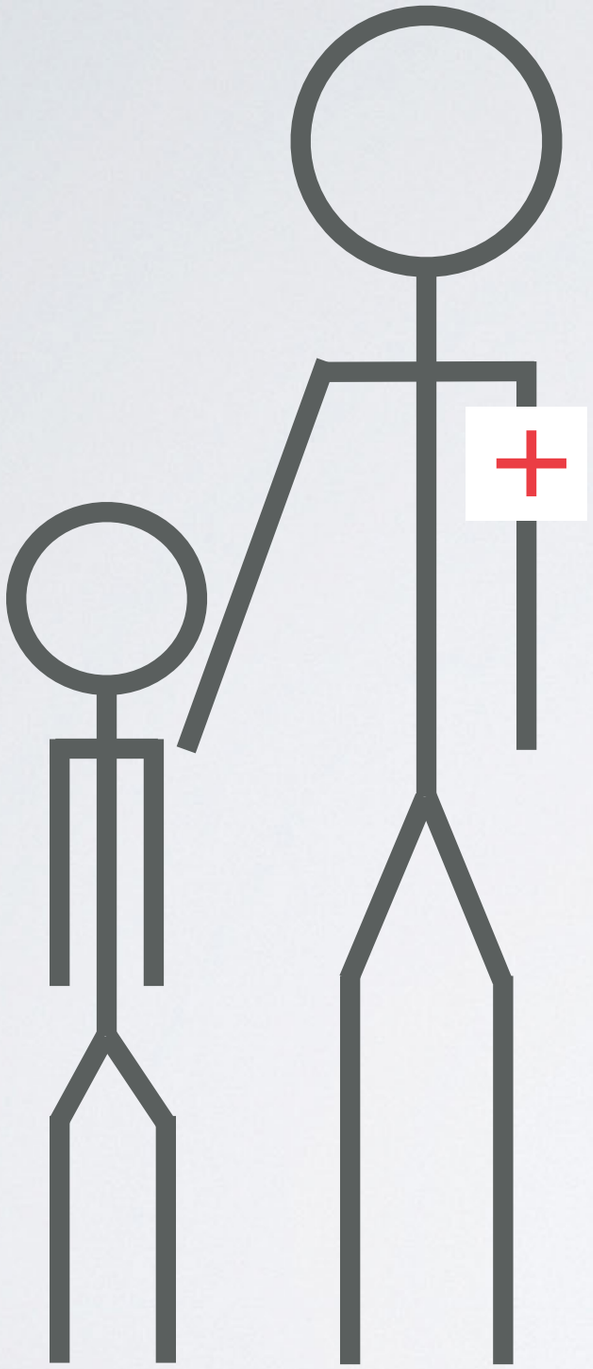


1.4.3
If possible, ask the patient if they want someone (family member, carer or friend) with them.

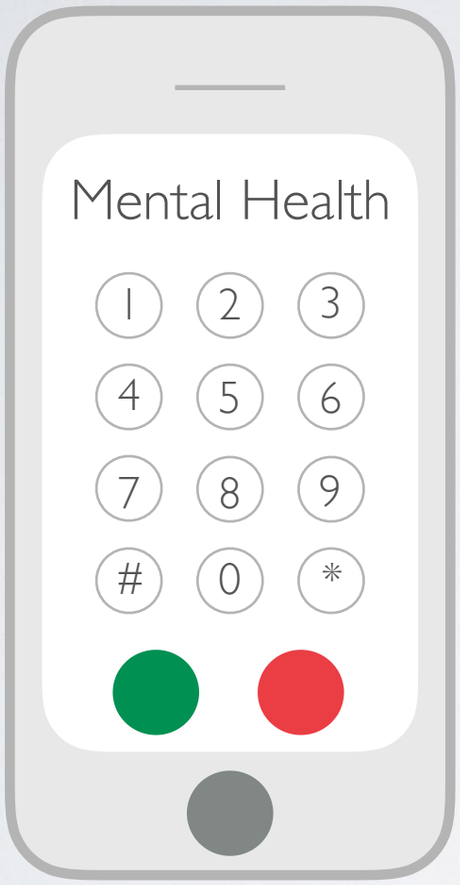


1.4.4
Reassure people while they are having procedures for fractures under local and regional anaesthesia.

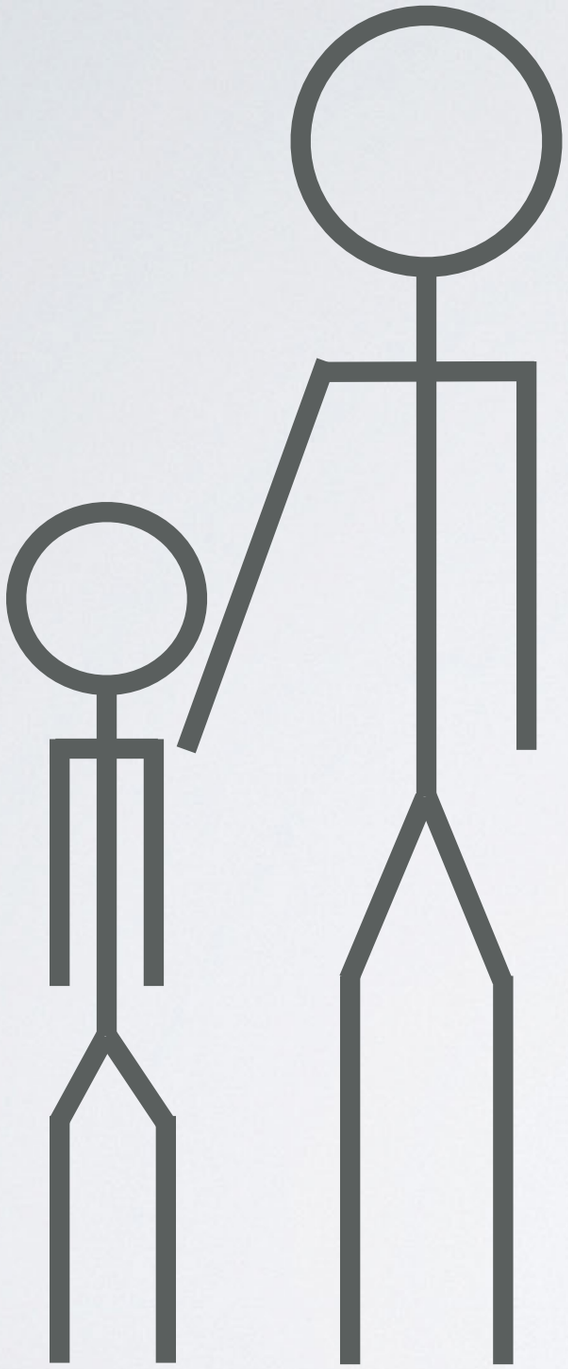
Support for children and vulnerable adults



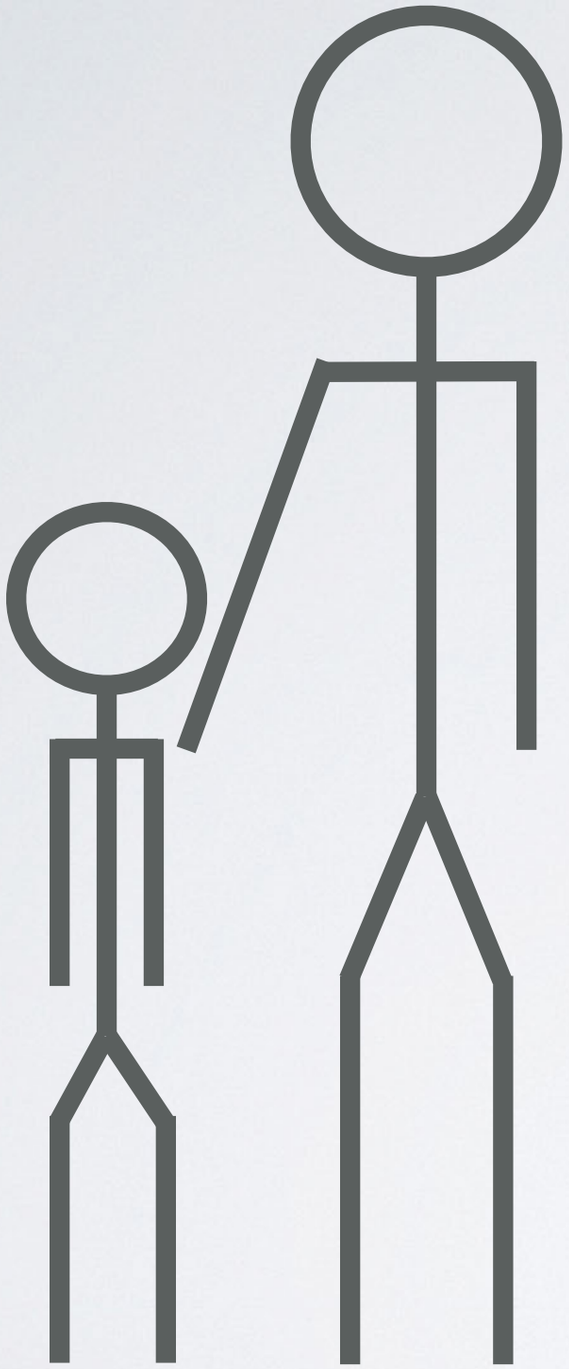
1.4.5
Allocate a dedicated member of staff to contact the next of kin and provide personal support for unaccompanied children and vulnerable adults



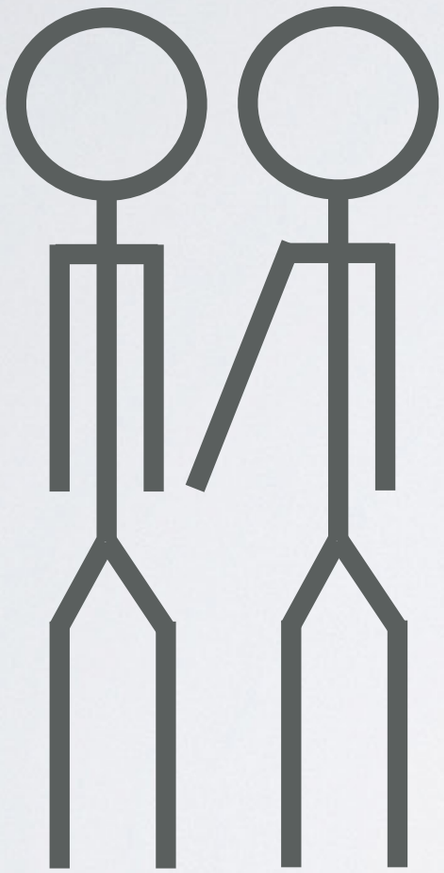
1.4.6
Contact the mental health team as soon as possible for patients who have a pre-existing psychological or psychiatric condition that might have contributed to their injury, or a mental health problem that might affect their wellbeing or care in hospital.



1.4.7
For children and vulnerable adults with a complex fracture, enable family members or carers to remain within eyesight if appropriate.

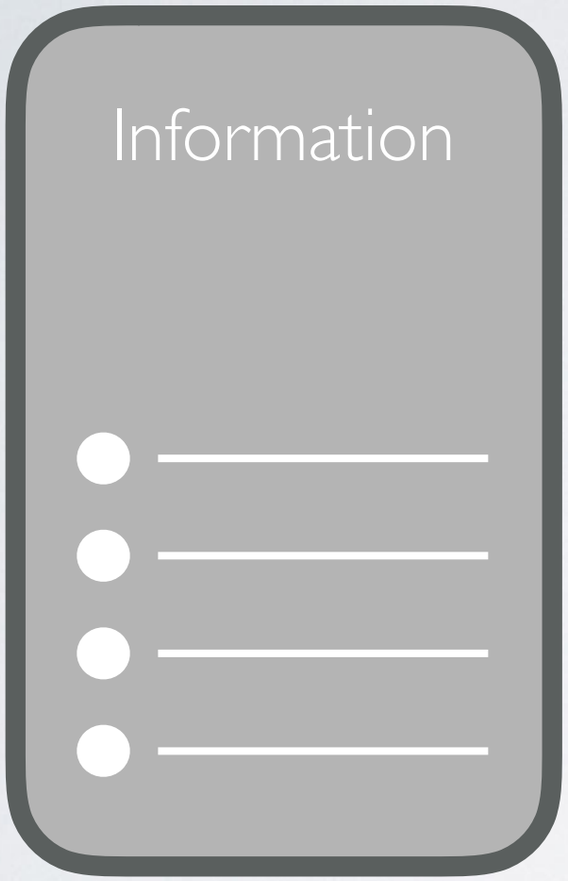


1.4.8
Work with family members and carers of children and vulnerable adults to provide information and support. Take into account age, developmental stage and cognitive function of the child or vulnerable adult.



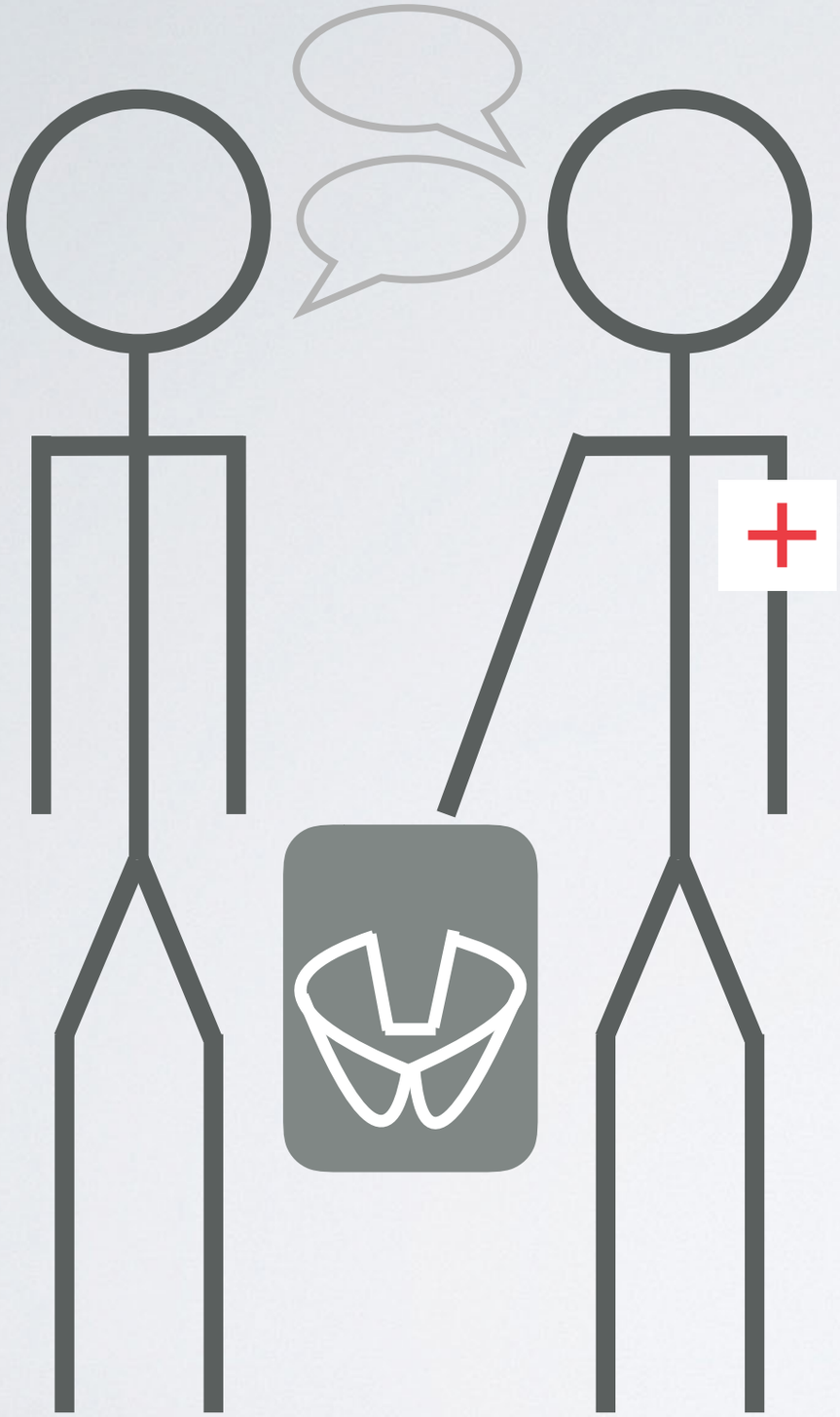
1.4.9
Include siblings of an injured child when offering support to family members and carers.

Providing information



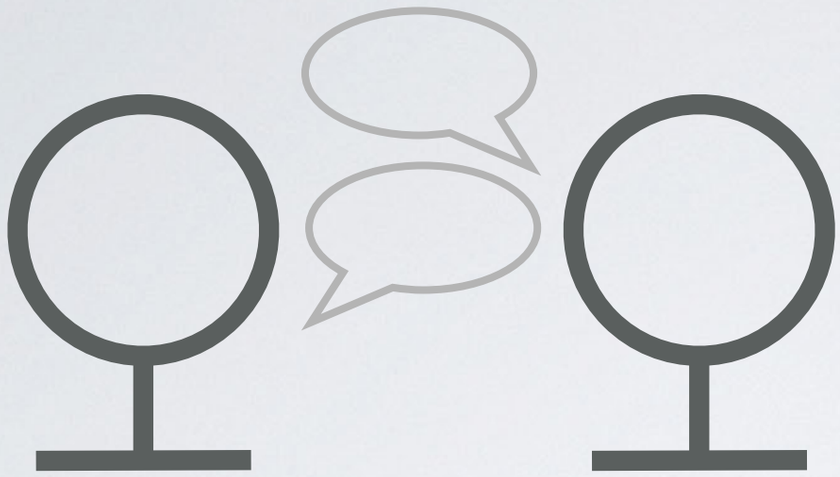
1.4.10
Explain to patients, family members and carers, what is happening and why it is happening. Provide:

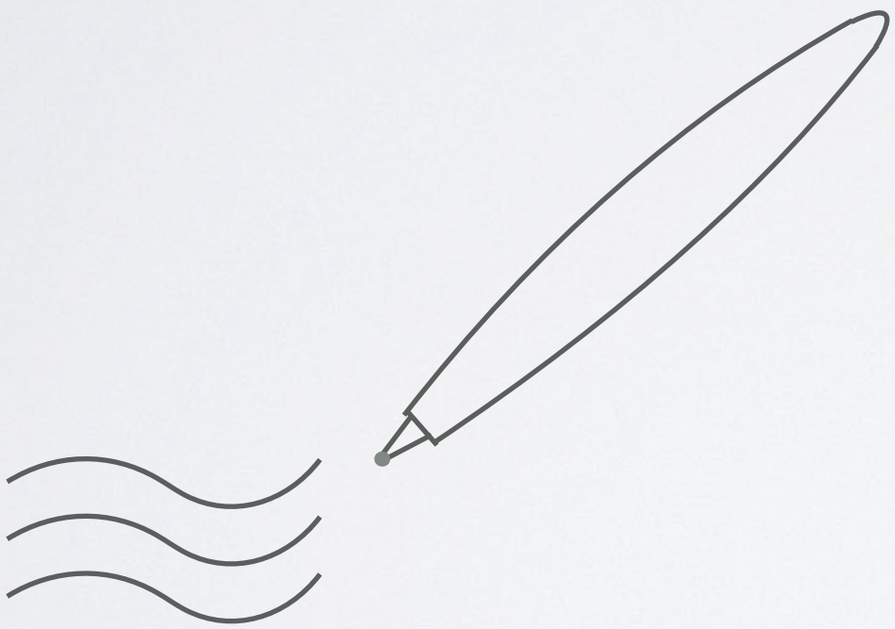
- information on known injuries
- details of immediate investigations and treatment, and if possible include time schedules.



1.4.11

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

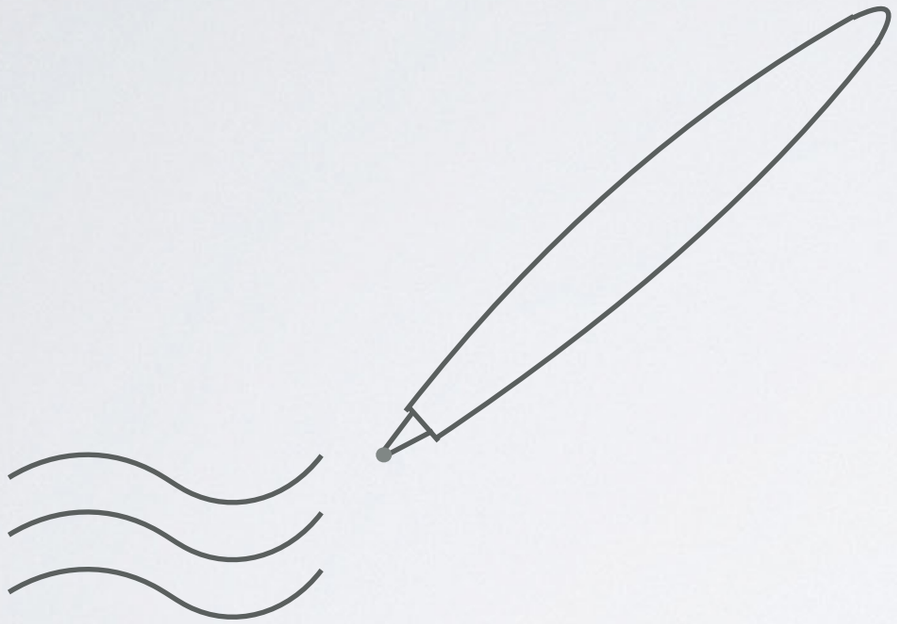




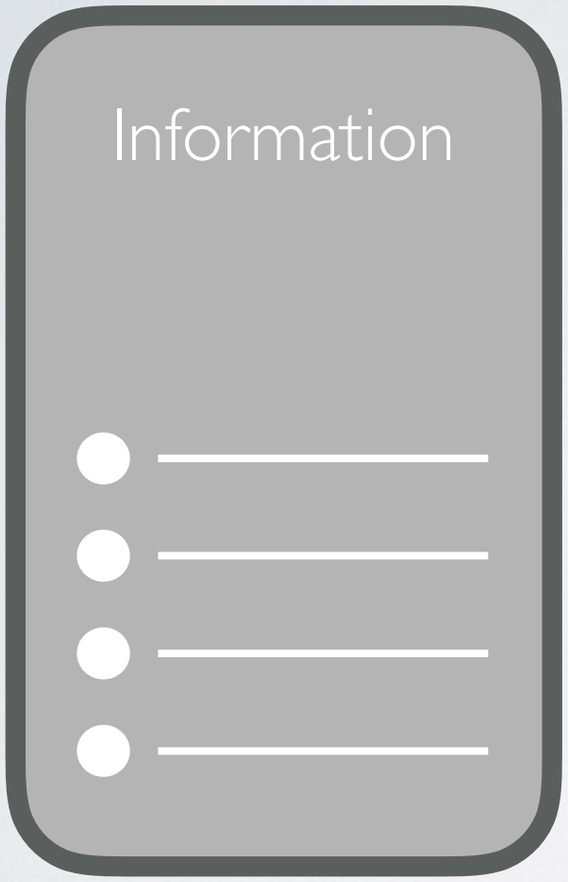
1.4.12
Provide people with fractures both verbal and written information on the following when the management plan is agreed or changed:
…

1.4.12 (continued)…

- expected outcomes of treatment, including time to returning to usual activities and the likelihood of permanent effects on quality of life (such as pain, loss of function and psychological effects)
- amputation, if this is a possibility
- activities they can do to help themselves
- home care options, if needed
- rehabilitation, including whom to contact and how (this should include information on the importance of active patient participation for achieving goals and the expectations of rehabilitation)
- mobilisation and weight-bearing, including upper limb load bearing for arm fractures.



1.4.13
Document all key communications with patients, family members and carers about the management plan.



1.4.14
Ensure that all health and social care practitioners have access to information previously given to people with fractures to enable consistent information to be provided.

Providing information about transfer from an emergency department

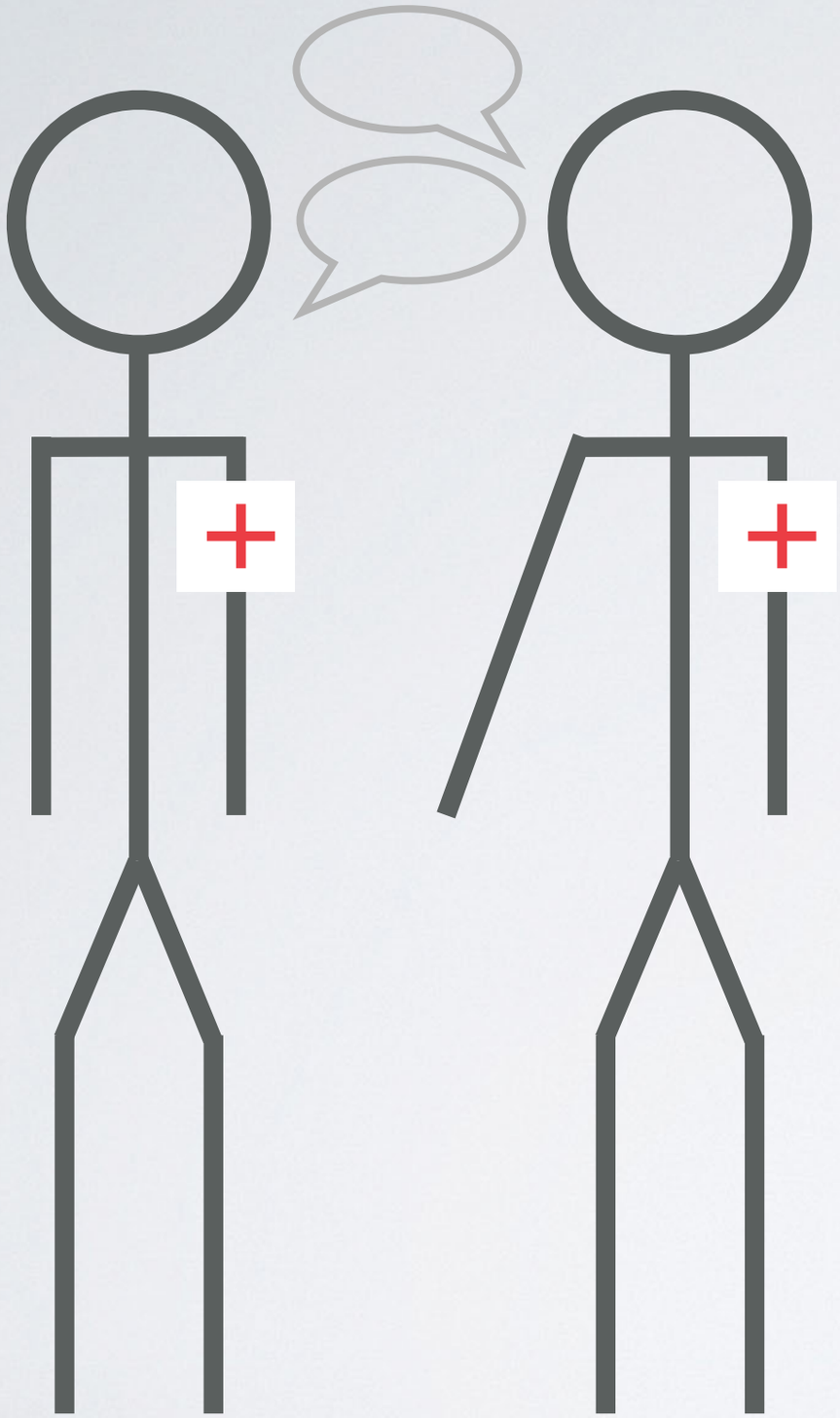
1.4.15
For patients who are being transferred from an emergency department to another centre, provide written information that includes:

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

1.5 TRAINING AND SKILLS

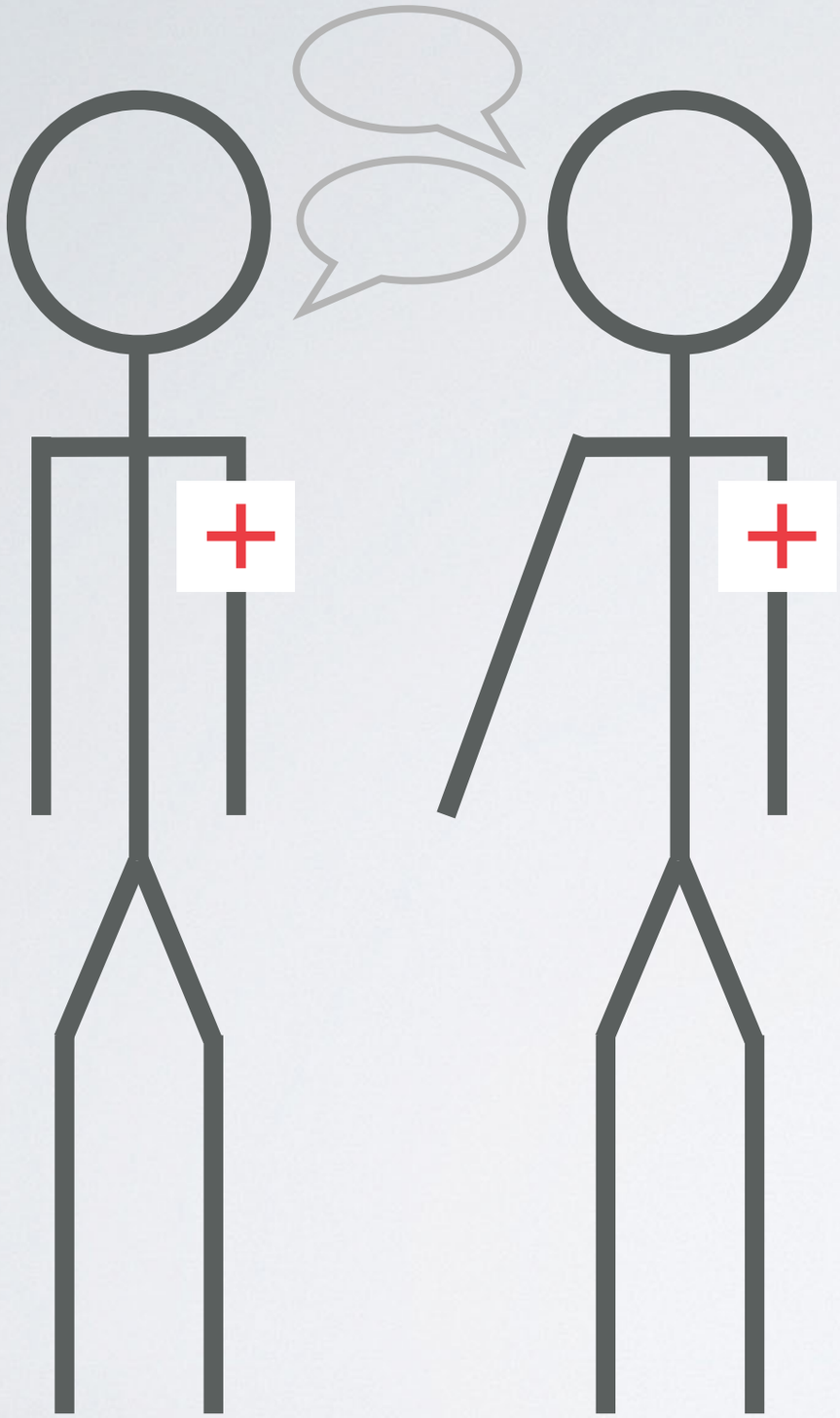
START

These recommendations are for ambulance and hospital trust boards, medical directors and senior managers within trauma networks.



1.5.1

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, major trauma services and spinal injury assessment.



1.5.2
Enable each healthcare professional who delivers care to people with fractures to have up-to-date training in the interventions they are required to give.

Terms used in this guideline

Delayed primary amputation
A procedure that is carried out when amputation is chosen as preferable to attempting reconstructive surgery for limb salvage, but not performed as an emergency operation.

Orthoplastic Centre
A hospital with a dedicated, combined service for orthopaedic and plastic surgery in which consultants from both specialties work simultaneously to treat open fractures as part of regular, scheduled, combined orthopaedic and plastic surgery operating lists. Consultants are supported by combined review clinics and specialist nursing teams.

menu

Please click below to answer to the following statement;

"This resource met my requirements".

Strongly disagree | Disagree | Neutral | Agree | Strongly agree

menu

END

To access the full guideline follow this link

http://www.nice.org.uk/guidance/ng37

NICE National Institute for Health and Care Excellence