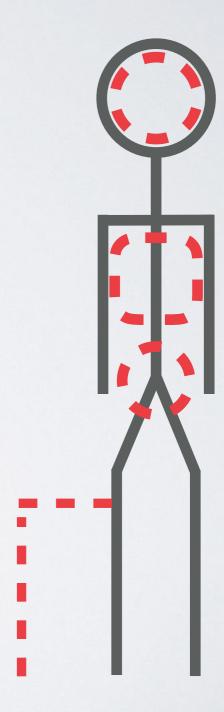


Interactive Infographic Slide Set

NG39 Major Trauma:

Assessment and Initial Management



START

# This resource presents **every** recommendation from the NICE Guideline, Major Trauma: Assessment and initial management accompanied by infographics.

It can be used to:

- read the guideline recommendations
- teach the guideline recommendations

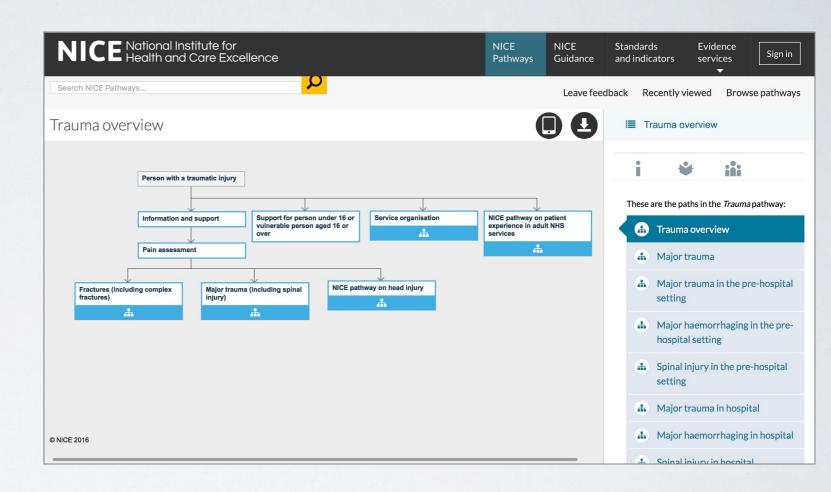
Click here to access the full guideline instead. <a href="http://www.nice.org.uk/guidance/ng39">http://www.nice.org.uk/guidance/ng39</a>



#### 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 <u>your care</u> on the NICE website.

See our website on <u>making decisions using NICE guidelines</u> to find out how we use words to show the strength (or certainty) of our recommendations, 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.

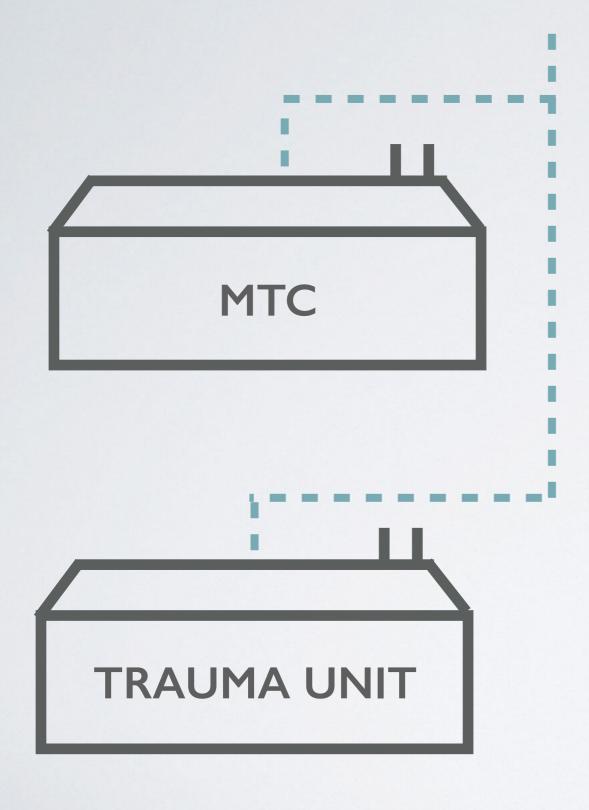


#### PLAY ALL

- Immediate destination after injury
- 1.2 Airway management in pre-hospital and hospital settings
- Management of chest trauma in pre-hospital settings
- Management of chest trauma in hospital settings
- 1.5 Management of haemorrhage in pre-hospital and hospital settings
- Reducing heat loss in pre-hospital and hospital settings
- Pain management in pre-hospital and hospital settings
- 1.8 Documentation in pre-hospital and hospital settings
- 1.9 Information and support for patients, family members and carers
- 1.10 Training and skills

# I. I IMMEDIATE DESTINATION AFTER INJURY

START



#### 1.1.1

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

# I.2 AIRWAY MANAGEMENT IN PRE-HOSPITAL AND HOSPITAL SETTINGS

START

# NICE Guideline on major trauma: service delivery

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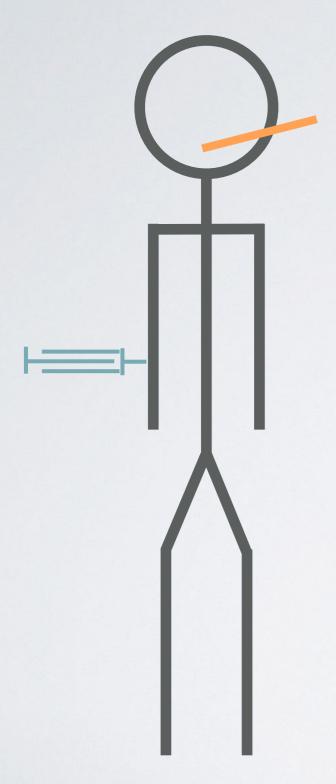
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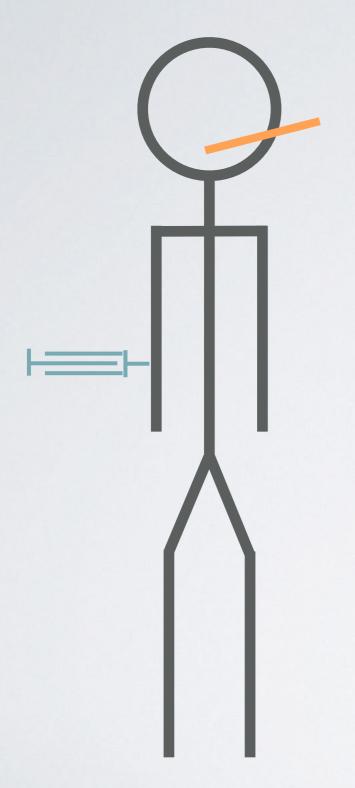
The NICE guideline on major trauma: service delivery contains a recommendation for ambulance and hospital trust boards, medical directors and senior managers on drug-assisted rapid sequence induction of anaesthesia and intubation.



### 1.2.1

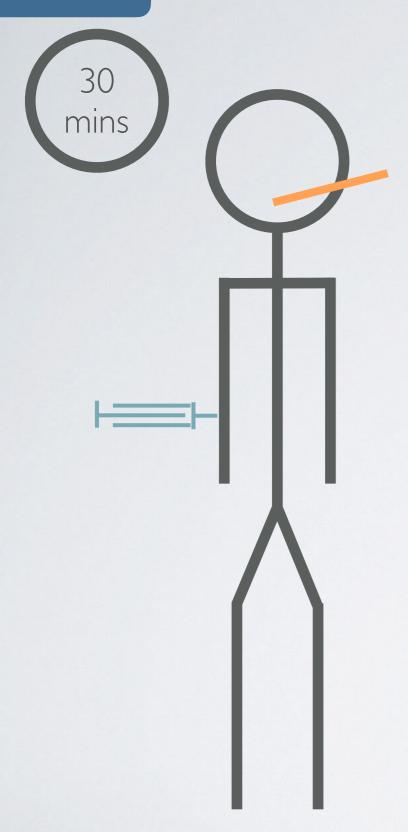
Use drug-assisted rapid sequence induction (RSI) of anaesthesia and intubation as the definitive method of securing the airway in patients with major trauma who cannot maintain their airway and/or ventilation.





I.2.2
If RSI fails, use basic airway
manoeuvres and adjuncts and/or a
supraglottic device until a surgical
airway or assisted tracheal
placement is performed.

Airway management in pre-hospital settings



# 1.2.3

Aim to perform RSI as soon as possible and within 45 minutes of the initial call to the emergency services, preferably at the scene of the incident...



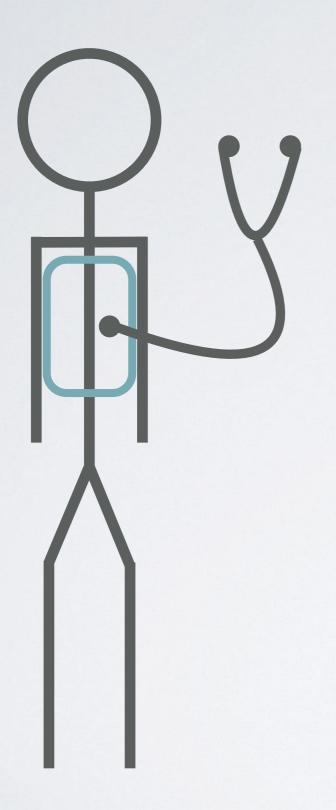
# 1.2.3 (continued)

If RSI cannot be performed at the scene:

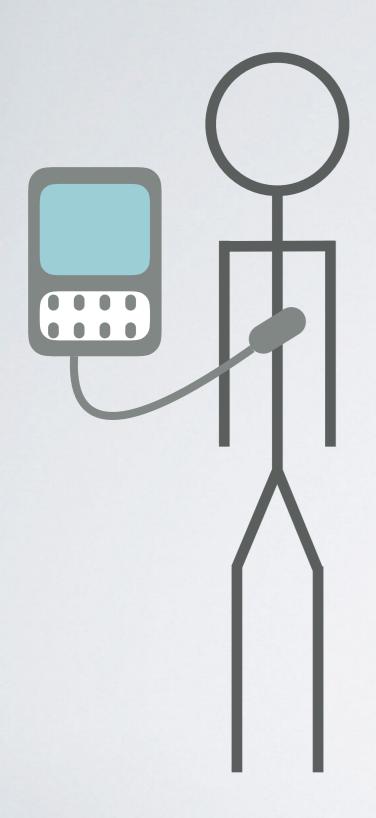
- consider using a supraglottic device if the patient's airway reflexes are absent
- use basic airway manoeuvres and adjuncts if the patient's airway reflexes are present or supraglottic device placement is not possible
- transport the patient to a major trauma centre for RSI provided the journey time is 60 minutes or less
- only divert to a trauma unit for RSI before onward transfer if a patent airway cannot be maintained or the journey time to a major trauma centre is more than 60 minutes.

# 1.3 MANAGEMENT OF CHEST TRAUMA IN PRE-HOSPITAL SETTINGS

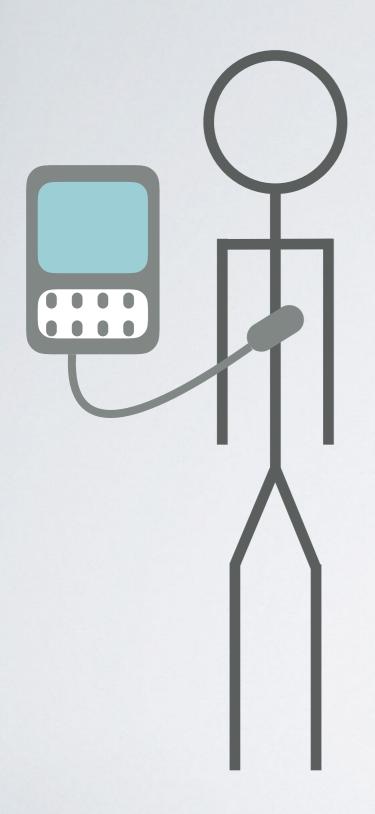
START



Use clinical assessment to diagnose pneumothorax for the purpose of triage or intervention.



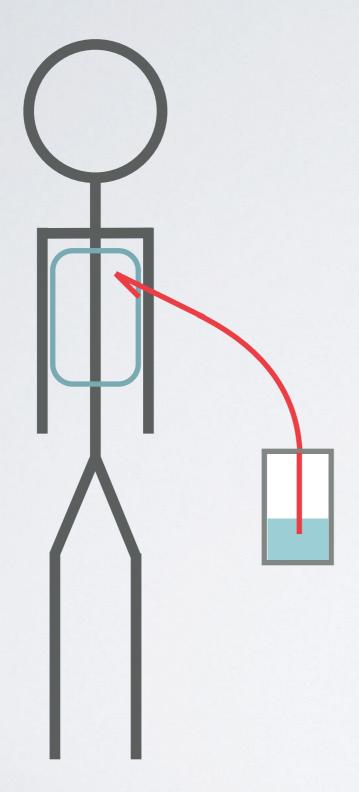
Consider using eFAST (extended focused assessment with sonography for trauma) to augment clinical assessment only if a specialist team equipped with ultrasound is immediately available and onward transfer will not be delayed.



Be aware that a negative eFAST of the chest does not exclude a pneumothorax.

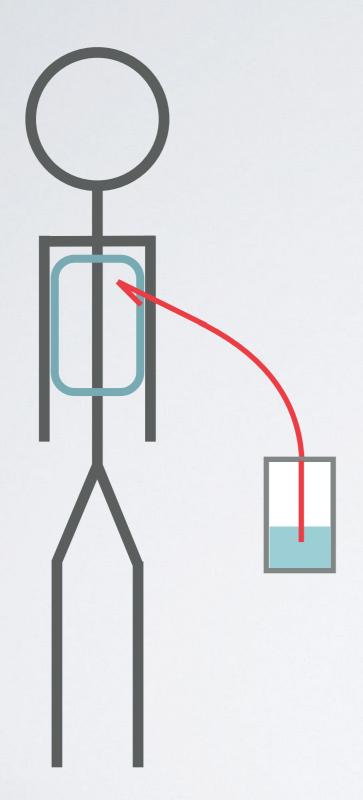


Only perform chest decompression in a patient with suspected tension pneumothorax if there is haemodynamic instability or severe respiratory compromise.



Use open thoracostomy instead of needle decompression if the expertise is available, followed by a chest drain via the thoracostomy in patients who are breathing spontaneously.





Observe patients after chest decompression for signs of recurrence of the tension pneumothorax.





I.3.7
In patients with an open pneumothorax:

- cover the open pneumothorax
   with a simple occlusive dressing
   and
- observe for the development of a tension pneumothorax.

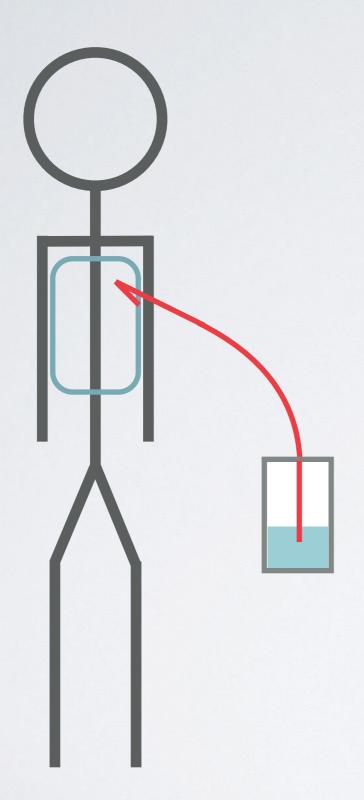
# I.4 MANAGEMENT OF CHESTTRAUMA IN HOSPITAL SETTINGS

START

Chest decompression of tension pneumothorax



In patients with tension pneumothorax, perform chest decompression before imaging only if they have either haemodynamic instability or severe respiratory compromise.



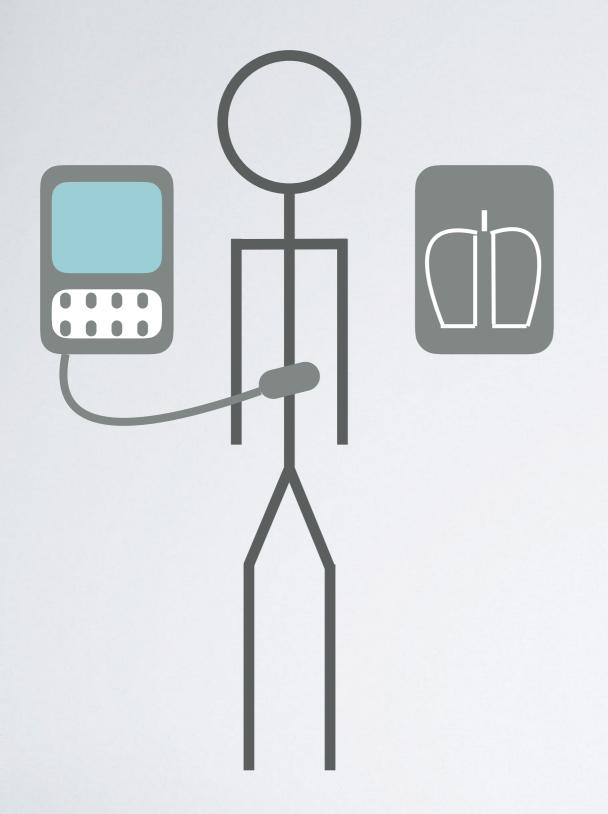
Perform chest decompression using open thoracostomy followed by a chest drain in patients with tension pneumothorax.

Imaging to assess chest trauma

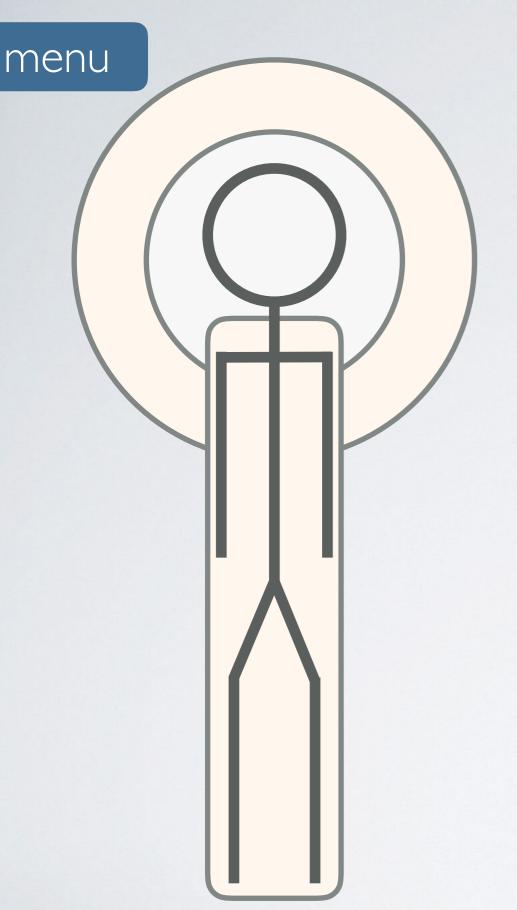




Imaging for chest trauma in patients with suspected chest trauma should be performed urgently, and the images should be interpreted immediately by a healthcare professional with training and skills in this area.

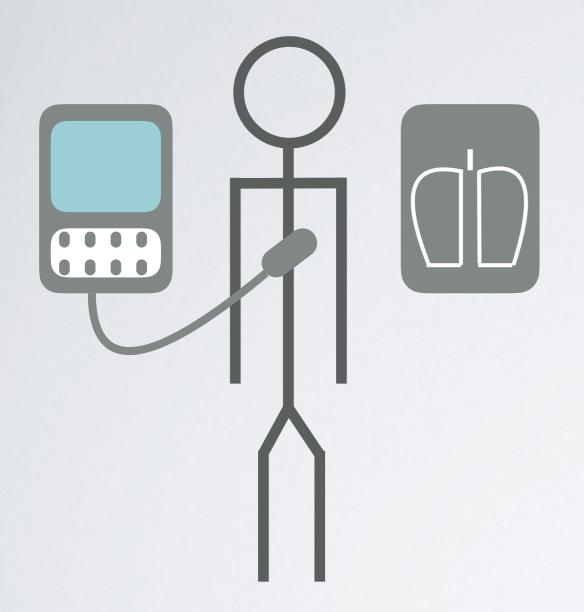


Consider immediate chest X-ray and/or eFAST (extended focused assessment with sonography for trauma) as part of the primary survey to assess chest trauma in adults (16 or over) with severe respiratory compromise.

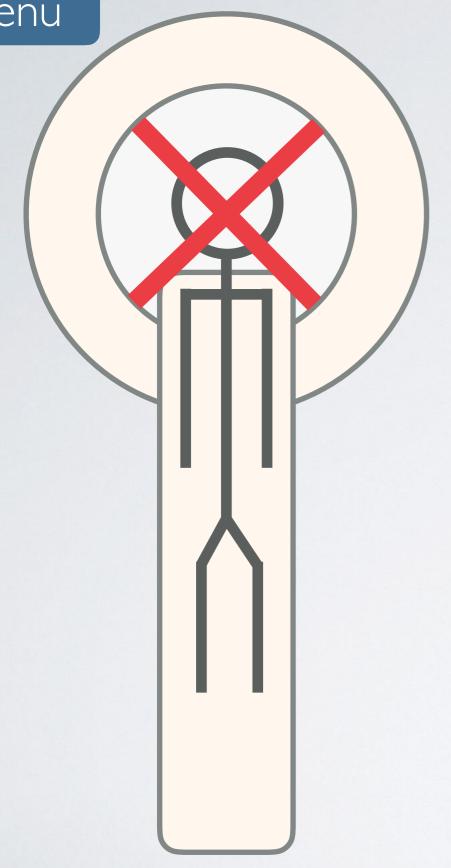


Consider immediate CT for adults (16 or over) without severe respiratory compromise who are responding to resuscitation or whose haemodynamic status is normal (see also recommendation 1.5.34 on whole-body CT).





Consider chest X-ray and/or ultrasound for first-line imaging to assess chest trauma in children (under 16s).



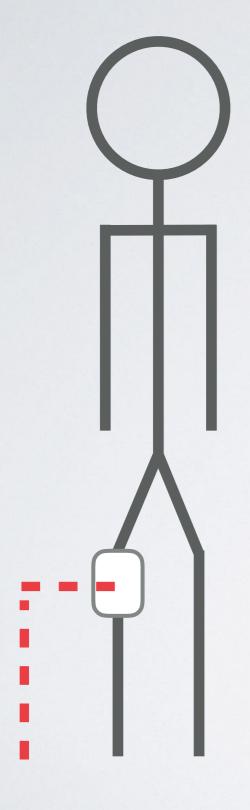
Do not routinely use CT for firstline imaging to assess chest trauma in children (under 16s).



# I.5 MANAGEMENT OF HAEMORRHAGE IN PRE-HOSPITAL AND HOSPITAL SETTINGS

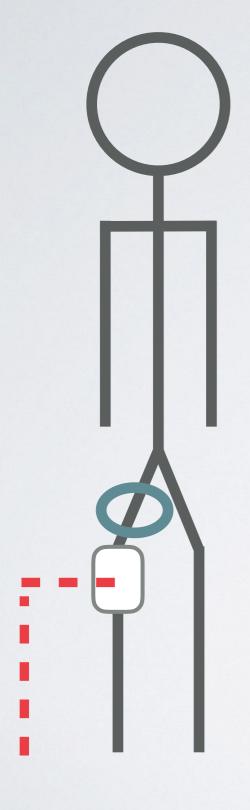
START

Dressings and tourniquets in pre-hospital and hospital settings



1.5.1

Use simple dressings with direct pressure to control external haemorrhage.

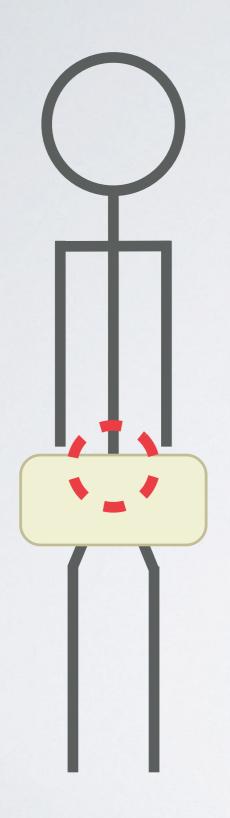


1.5.2

In patients with major limb trauma use a tourniquet if direct pressure has failed to control life-threatening haemorrhage.



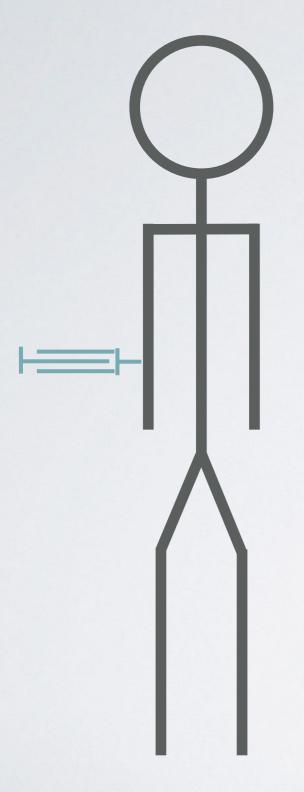
Pelvic binders in pre-hospital settings



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

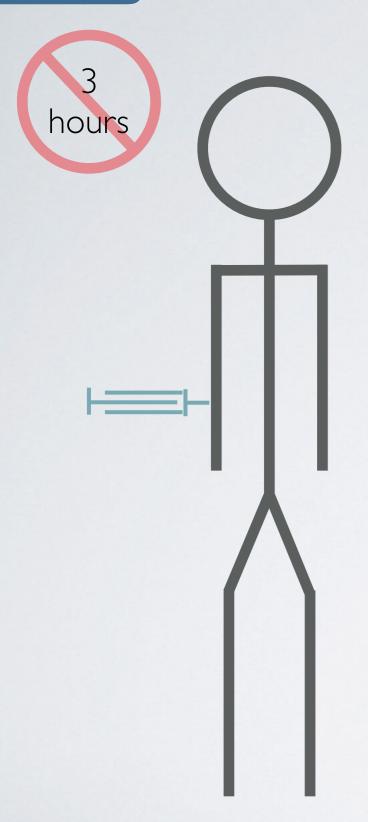
- •apply a purpose-made pelvic binder or
- consider an improvised pelvic binder, but only if a purpose-made binder does not fit.

Haemostatic agents in pre-hospital and hospital settings



1.5.4

Use intravenous tranexamic acid<sup>1</sup> as soon as possible in patients with major trauma and active or suspected active bleeding.



1.5.5

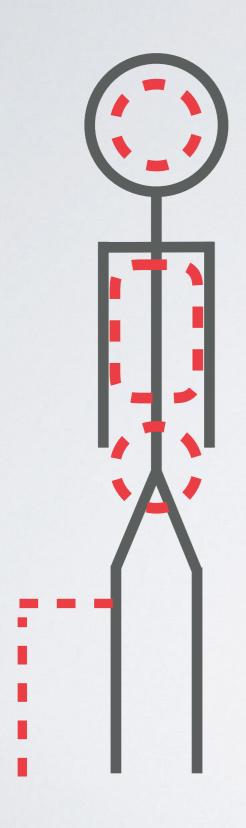
Do not use intravenous tranexamic acid<sup>1</sup> more than 3 hours after injury in patients with major trauma unless there is evidence of hyperfibrinolysis.

# Pre-hospital

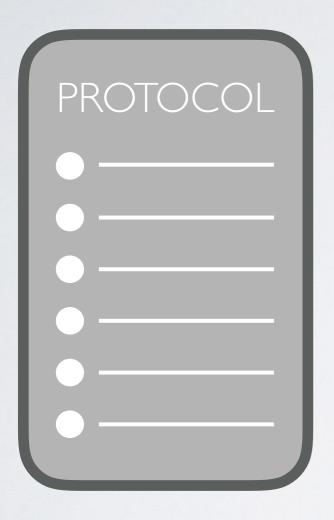
In hospital

At the time of publication (February 2016), tranexamic acid did not have a UK marketing authorisation 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.

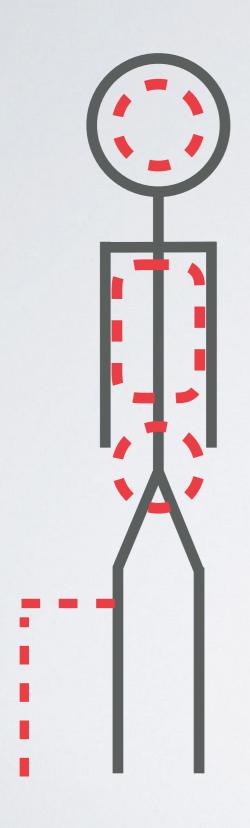
Anticoagulant reversal in hospital settings



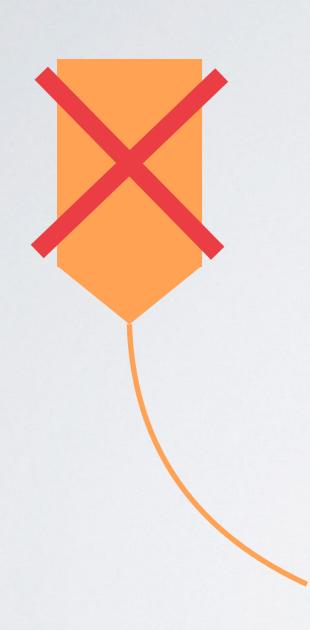
Rapidly reverse anticoagulation in patients who have major trauma with haemorrhage.



Hospital trusts that admit patients with major trauma should have a protocol for the rapid identification of patients who are taking anticoagulants and the reversal of anticoagulation agents.



Use prothrombin complex concentrate immediately in adults (16 or over) with major trauma who have active bleeding and need emergency reversal of a vitamin K antagonist.



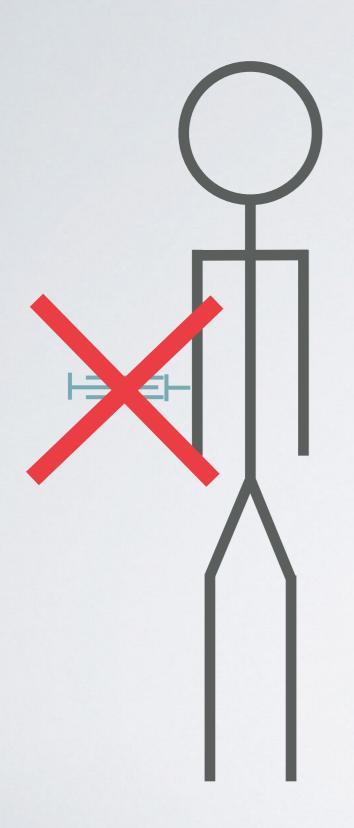
Do not use plasma to reverse a vitamin K antagonist in patients with major trauma.



Consult a haematologist immediately for advice on adults (16 and over) who have active bleeding and need reversal of any anticoagulant agent other than a vitamin K antagonist.

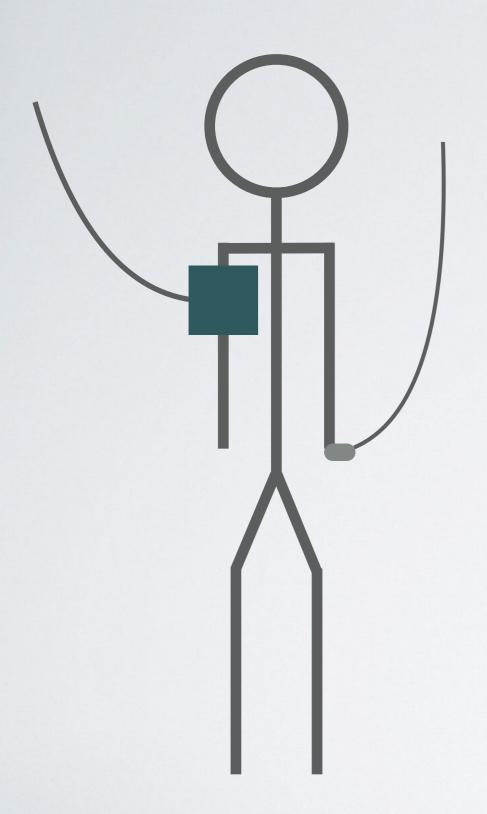


Consult a haematologist immediately for advice on children (under 16s) with major trauma who have active bleeding and may need reversal of any anticoagulant agent.



Do not reverse anticoagulation in patients who do not have active or suspected bleeding.

Activating major haemorrhage protocols in hospital settings

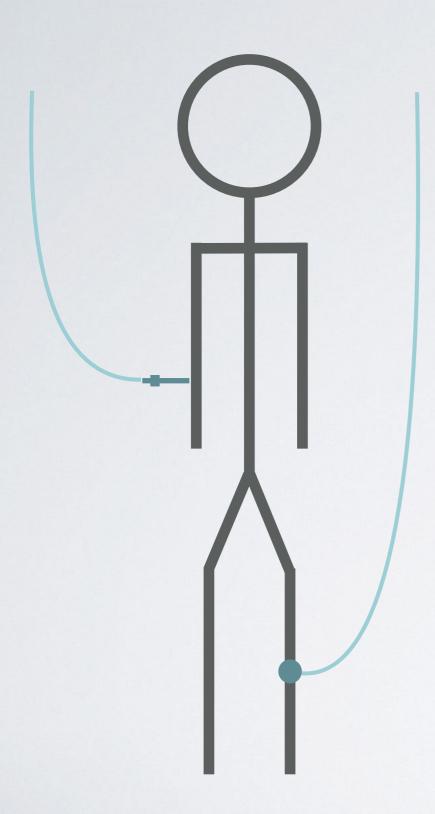


Use physiological criteria that include the patient's haemodynamic status and their response to immediate volume resuscitation to activate the major haemorrhage protocol.



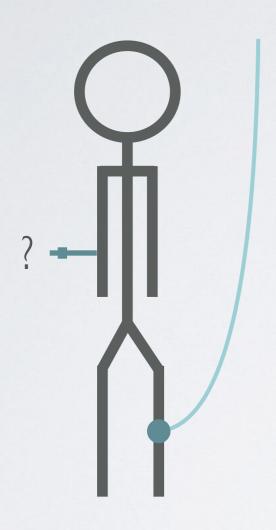
Do not rely on a haemorrhagic risk tool applied at a single time point to determine the need for major haemorrhage protocol activation.

Circulatory access in pre-hospital settings



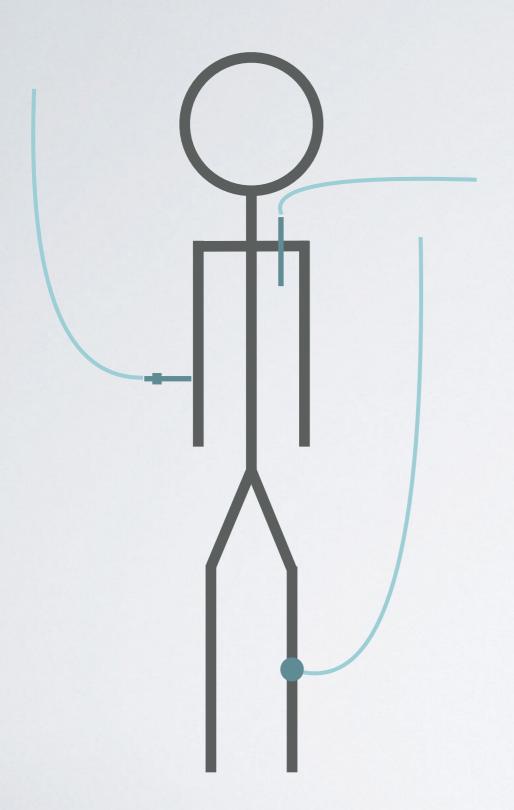
For circulatory access in patients with major trauma in pre-hospital settings:

- use peripheral intravenous access **or**
- if peripheral intravenous access fails, consider intraosseous access.



For circulatory access in children (under 16s) with major trauma, consider intraosseous access as first-line access if peripheral access is anticipated to be difficult.

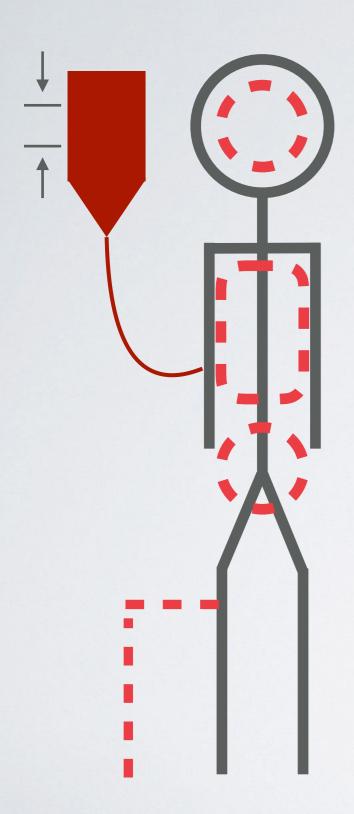
Circulatory access in hospital settings



For circulatory access in patients with major trauma in hospital settings:

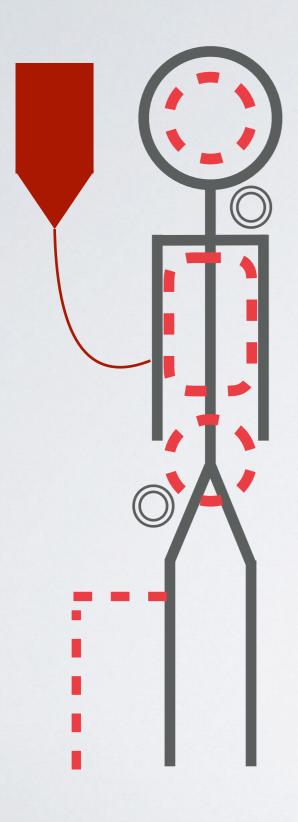
- use peripheral intravenous access **or**
- if peripheral intravenous access fails, consider intra-osseous access while central access in being achieved.

Volume resuscitation in pre-hospital and hospital settings



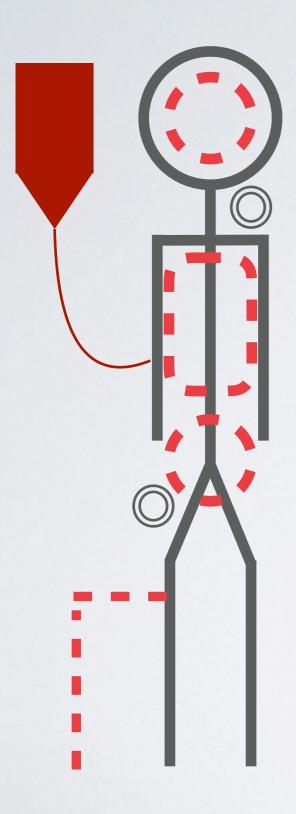
1.5.18

For patients with active bleeding use a restrictive approach to volume resuscitation until definitive early control of bleeding has been achieved.

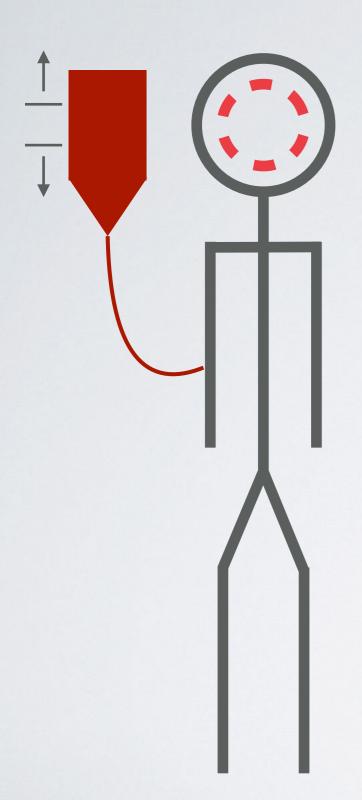


1.5.19

In pre-hospital settings, titrate volume resuscitation to maintain a palpable central pulse (carotid or femoral).



In hospital settings, move rapidly to haemorrhage control, titrating volume resuscitation to maintain central circulation until control is achieved.



# 1.5.21

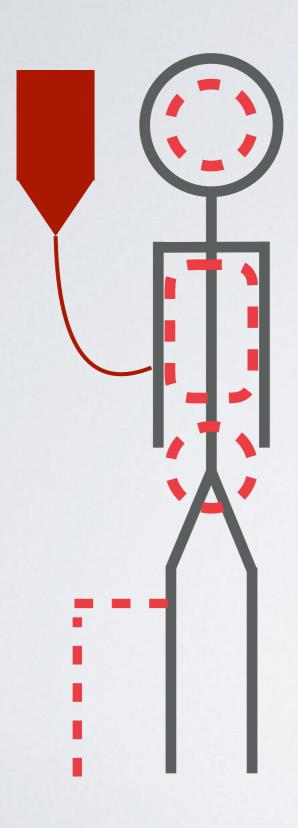
For patients who have haemorrhagic shock and a traumatic brain injury:

- if haemorrhagic shock is the dominant condition, continue restrictive volume resuscitation **or**
- if traumatic brain injury is the dominant condition, use a less restrictive volume resuscitation approach to maintain cerebral perfusion.

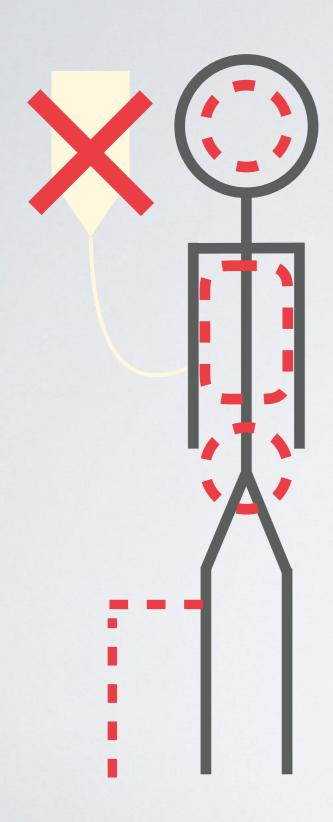
Pre-hospital

In hospital

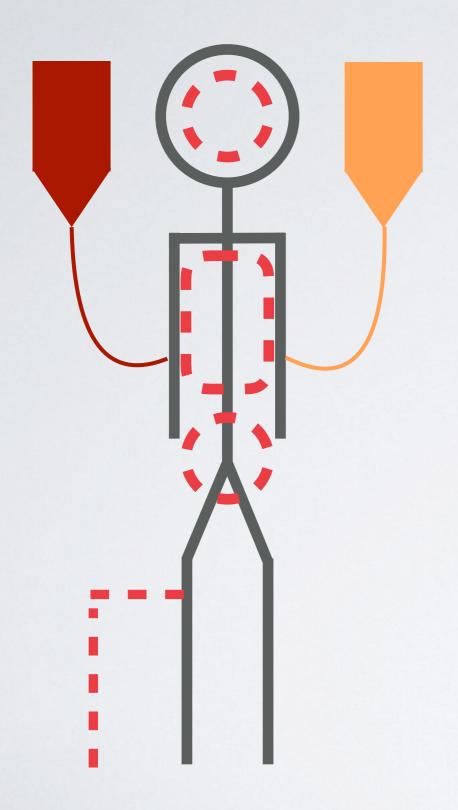
Fluid replacement in pre-hospital and hospital settings



In pre-hospital settings only use crystalloids to replace fluid volume in patients with active bleeding if blood components are not available.

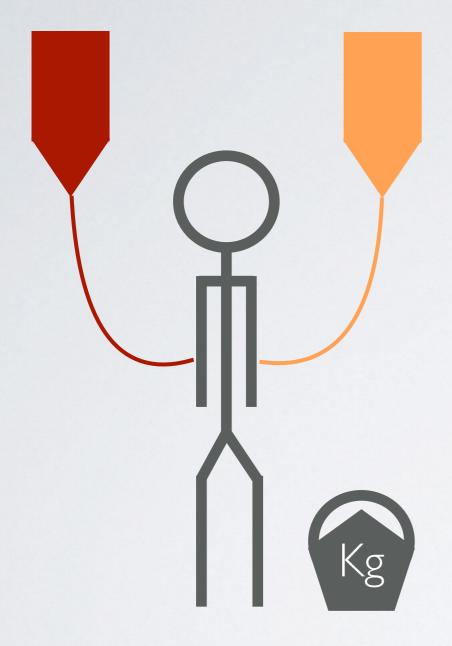


In hospital settings do not use crystalloids for patients with active bleeding. See the section on resuscitation in the NICE guideline 'Intravenous fluid therapy in adults in hospital' and the section on fluid resuscitation in the NICE guideline 'Intravenous fluid therapy in children and young people in hospital' for advice on tetrastarches.



1.5.24

For adults (16 or over) use a ratio of I unit of plasma to I unit of red blood cells to replace fluid volume.



1.5.25

For children (under 16s) use a ratio of I part plasma to I part red blood cells, and base the volume on the child's weight.

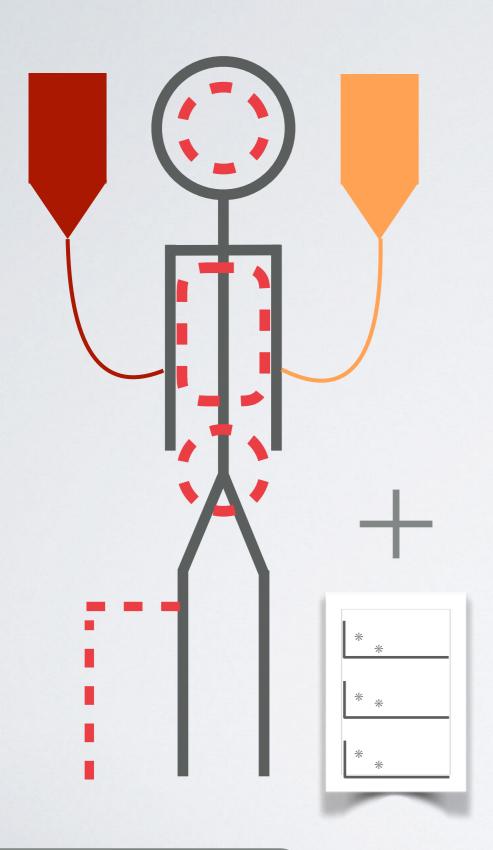
Haemorrhage protocols in hospital settings

Major Haemorrhage Protocol (adult)

> Major Haemorrhage Protocol (child)

1.5.26

Hospital trusts should have specific major haemorrhage protocols for adults (16 or over) and children (under 16s).

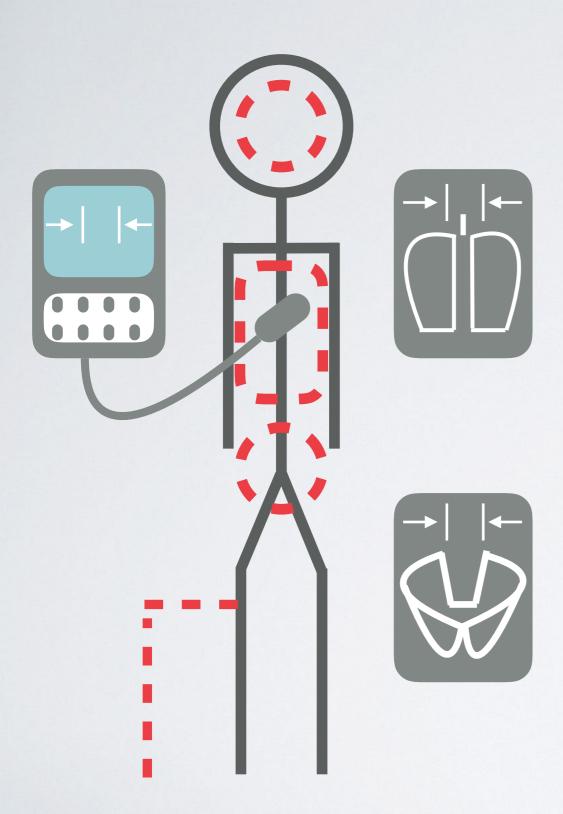


For patients with active bleeding, start with a fixed-ratio protocol for blood components and change to a protocol guided by laboratory coagulation results at the earliest opportunity.

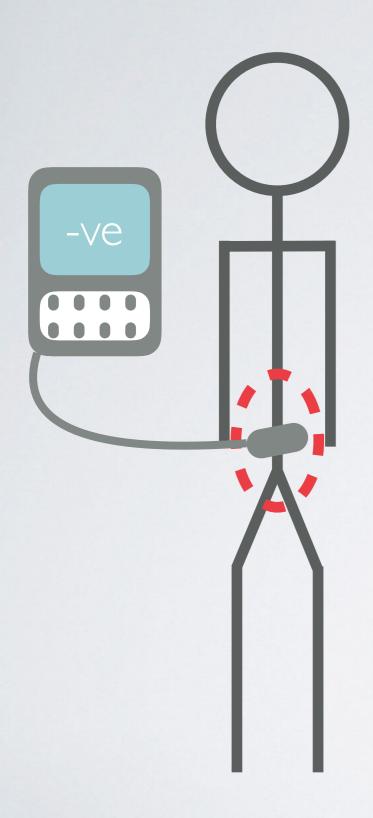
Haemorrhage imaging in hospital settings



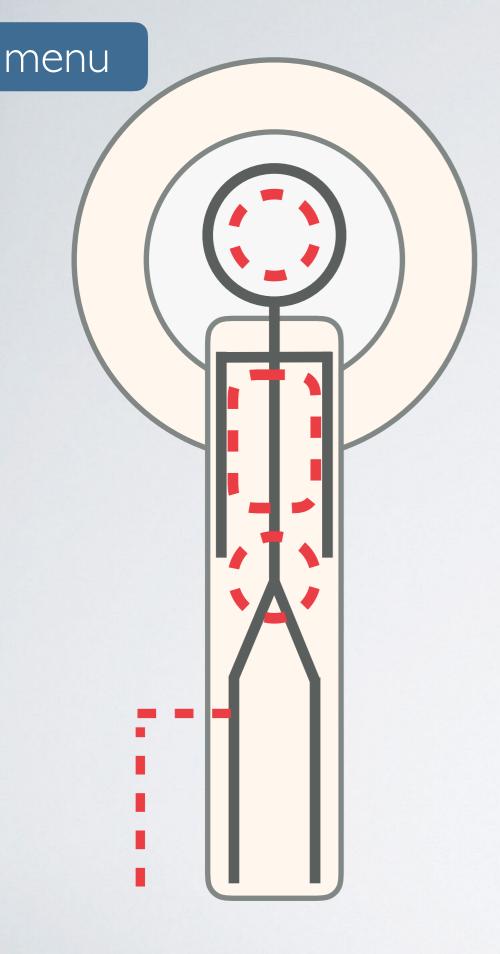
Imaging for haemorrhage in patients with suspected haemorrhage should be performed urgently, and the images should be interpreted immediately by a healthcare professional with training and skills in this area.



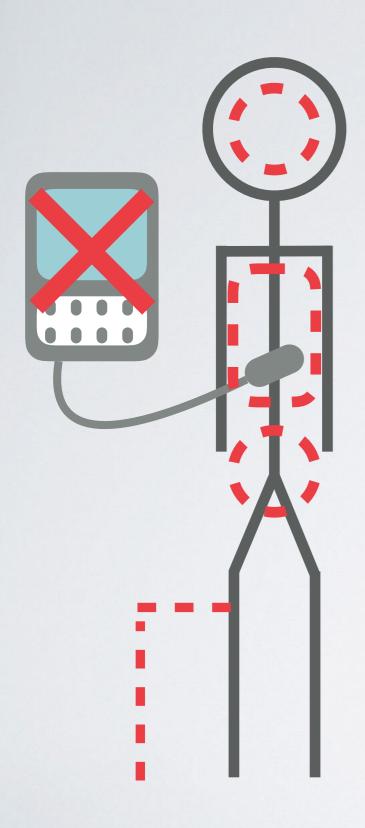
Limit diagnostic imaging (such as chest and pelvis X-rays or FAST [focused assessment with sonography for trauma]) to the minimum needed to direct intervention in patients with suspected haemorrhage and haemodynamic instability who are not responding to volume resuscitation.



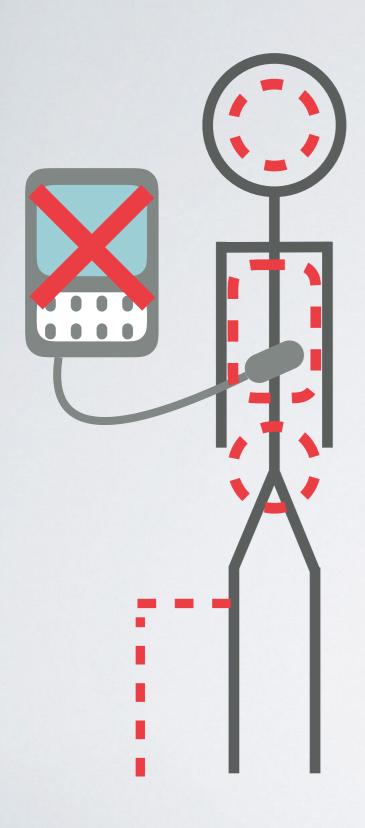
Be aware that a negative FAST does not exclude intraperitoneal or retroperitoneal haemorrhage.



Consider immediate CT for patients with suspected haemorrhage if they are responding to resuscitation or if their haemodynamic status is normal.

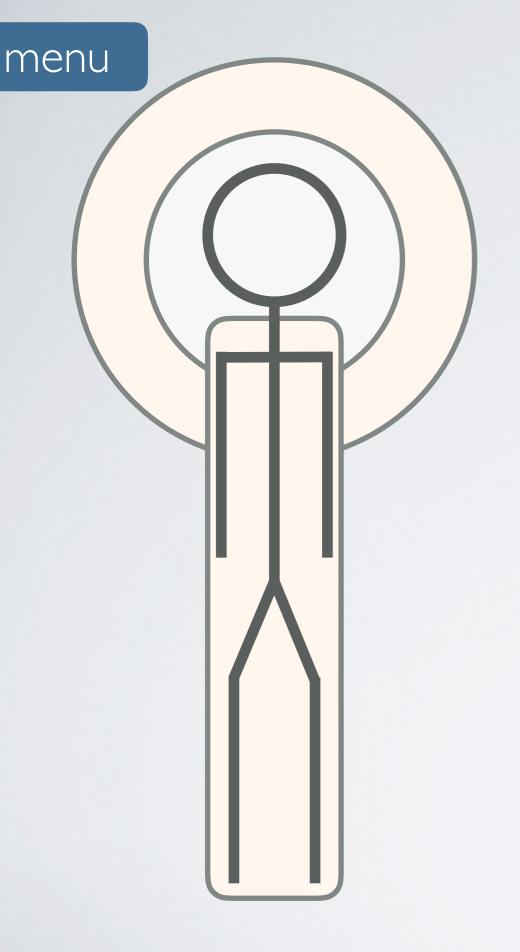


Do not use FAST or other diagnostic imaging before immediate CT in patients with major trauma.

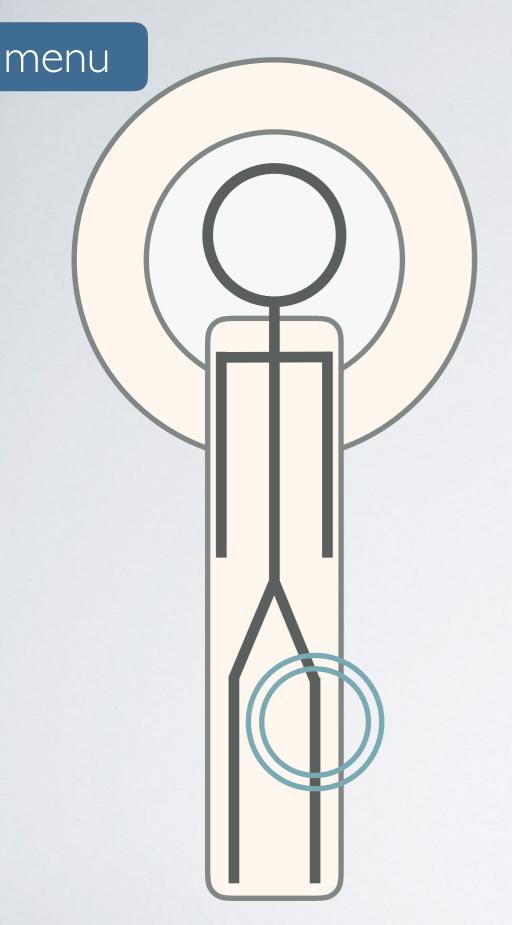


Do not use FAST as a screening modality to determine the need for CT in patients with major trauma.

Whole-body CT of multiple injuries

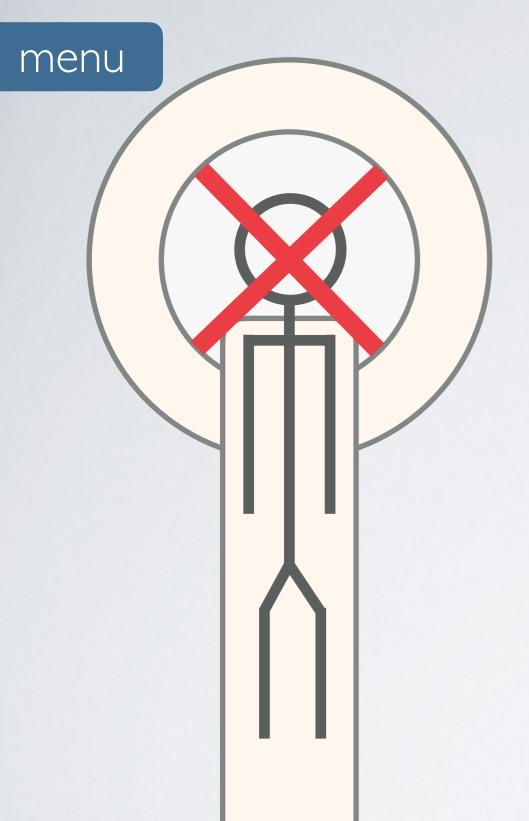


Use whole-body CT (consisting of a vertex-to-toes scanogram followed by a CT from vertex to mid-thigh) in adults (16 or over) with blunt major trauma and suspected multiple injuries. Patients should not be repositioned during whole-body CT.



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

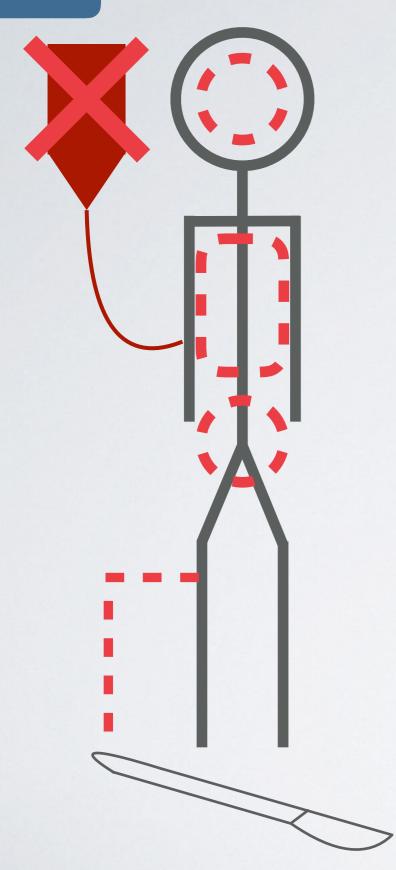




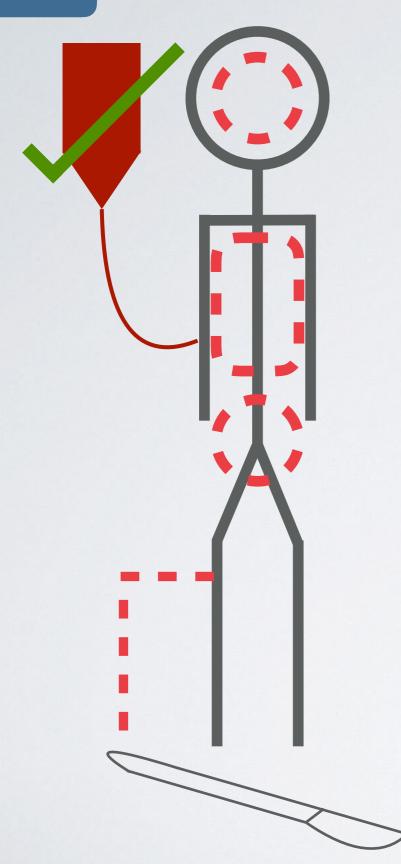
Do not routinely use whole-body CT to image children (under 16s). Use clinical judgement to limit CT to the body areas where assessment is needed.

Damage control surgery

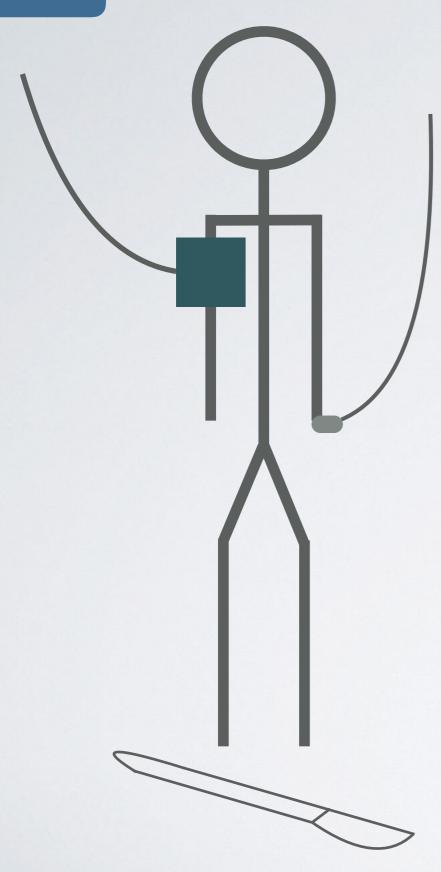




Use damage control surgery in patients with haemodynamic instability who are not responding to volume resuscitation.



Consider definitive surgery in patients with haemodynamic instability who are responding to volume resuscitation.



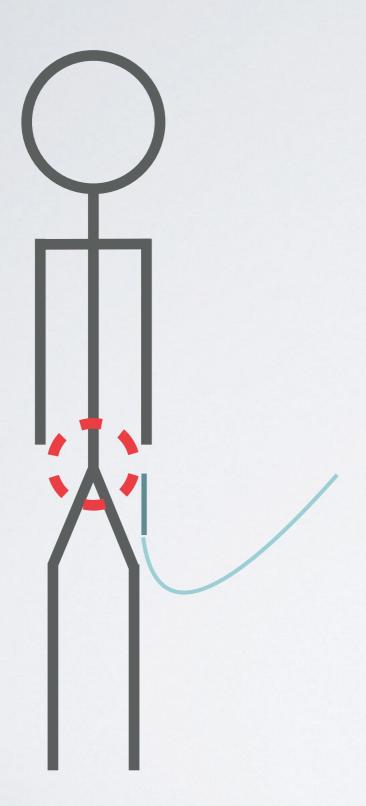
Use definitive surgery in patients whose haemodynamic status is normal.

Interventional radiology

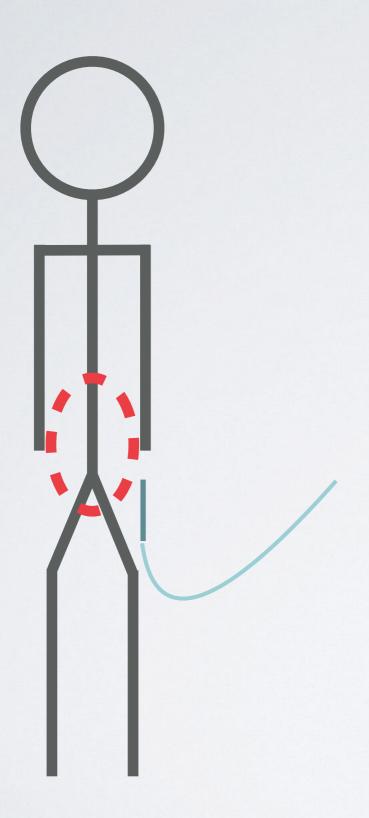


NICE Guideline on major trauma: service delivery

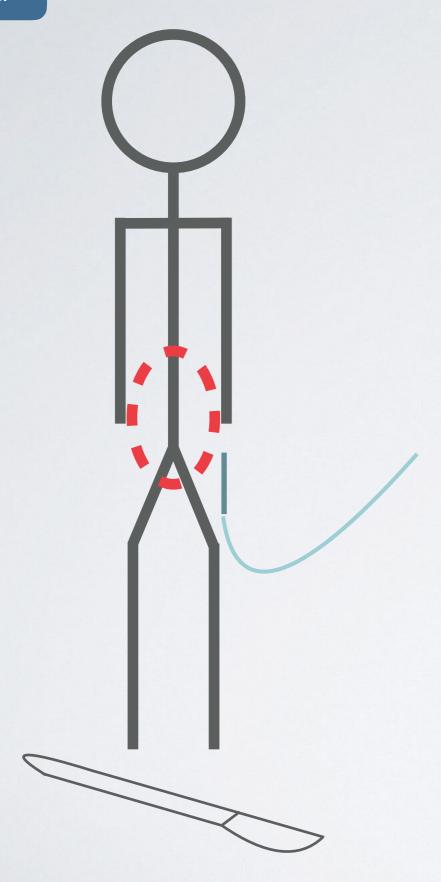
The NICE guideline on major trauma: service delivery contains a recommendation for ambulance and hospital trust boards, medical directors and senior managers on interventional radiology and definitive open surgery.



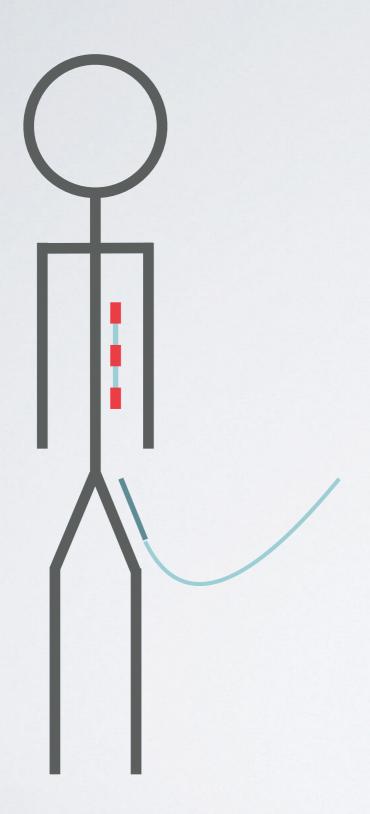
Use interventional radiology techniques in patients with active arterial pelvic haemorrhage unless immediate open surgery is needed to control bleeding from other injuries.



1.5.41
Consider interventional radiology techniques in patients with solid-organ (spleen, liver or kidney) arterial haemorrhage.



Consider a joint interventional radiology and surgery strategy for arterial haemorrhage that extends to surgically inaccessible regions.



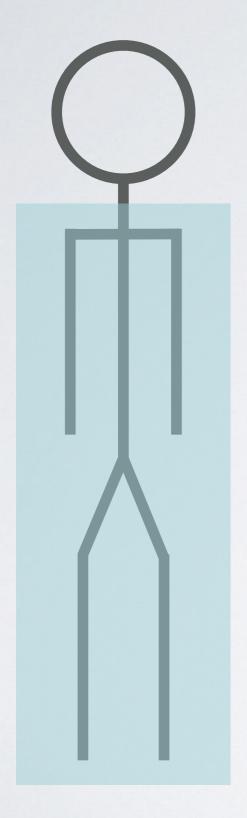
Use an endovascular stent graft in patients with blunt thoracic aortic injury.

In hospital

# I.6 REDUCING HEAT LOSS IN PRE-HOSPITAL AND HOSPITAL SETTINGS

START

In hospital



1.6.1

Minimise ongoing heat loss in patients with major trauma.

In hospital

# 1.7 PAIN MANAGEMENT IN PRE-HOSPITAL AND HOSPITAL SETTINGS

START

In hospital

Pain assessment

In hospital

NICE Guideline on patient experience in adult services

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### 1.7.1

See the NICE guideline on patient experience in adult NHS services for advice on assessing pain in adults.

In hospital



1.7.2

Assess pain regularly in patients with major trauma using a pain assessment scale suitable for the patient's age, developmental stage and cognitive function.

In hospital



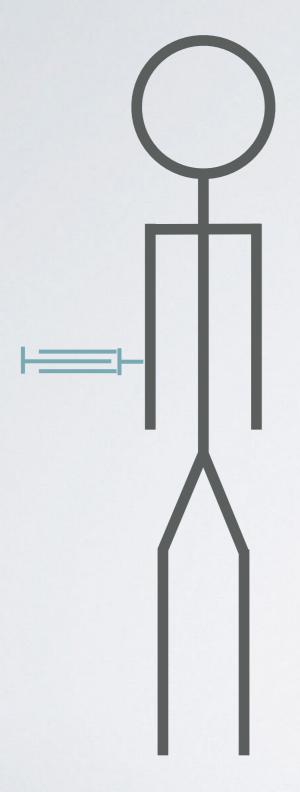
1.7.3

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

In hospital

Pain relief

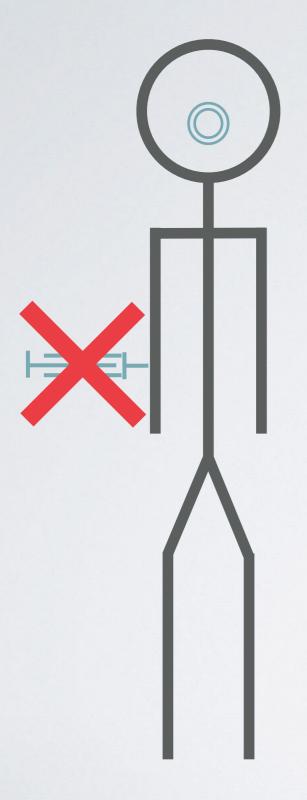
In hospital



1.7.4

For patients with major trauma, use intravenous morphine as the first-line analgesic and adjust the dose as needed to achieve adequate pain relief.

In hospital



1.7.5

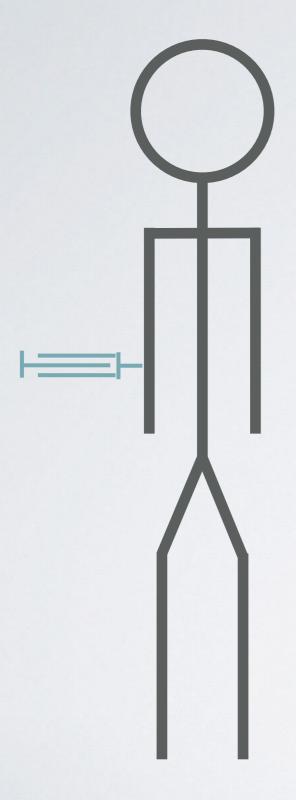
If intravenous access has not been established, consider the intranasal route for atomised delivery of diamorphine or ketamine<sup>2</sup>.



In hospital

2 At the time of publication (February 2016), neither intranasal diamorphine nor intranasal ketamine had a UK marketing authorisation 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 <u>Prescribing guidance</u>: <u>prescribing unlicensed medicines</u> for further information.

In hospital



1.7.6

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

Documentation

Pre-hospital

In hospital

# I.8 DOCUMENTATION IN PRE-HOSPITAL AND HOSPITAL SETTINGS

START

### Documentation

Pre-hospital

In hospital

# 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.

Recording information in pre-hospital settings

#### 1.8.1

Record the following in patients with major trauma in prehospital settings:

- catastrophic haemorrhage
- airway with in line spinal immobilisation
- breathing
- circulation
- disability (neurological)
- exposure and environment

(<C>ABCDE)



Pre-hospital



1.8.2

If possible, record information on whether the assessments show that the patient's condition is improving or deteriorating.



Pre-hospital

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

- the patient's age and sex
- time of incident
- mechanism of injury
- injuries suspected
- signs, including vital signs and Glasgow Coma Scale
- treatment so far
- estimated time of arrival at emergency department
- special requirements
- the ambulance call sign, name of the person taking the call and time of call.

In hospital

Receiving information in hospital settings

In hospital



#### 1.8.4

A senior nurse or trauma team leader in the emergency department should receive the pre-alert information and determine the level of trauma team response according to agreed and written local guidelines.



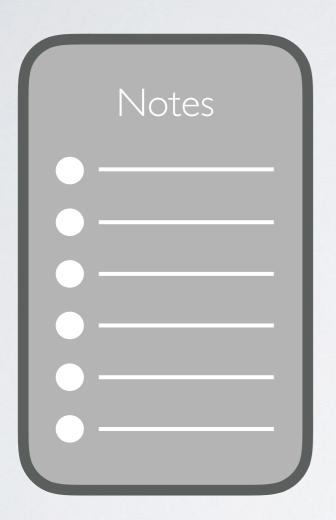
In hospital



1.8.5

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

In hospital



1.8.6

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

In hospital

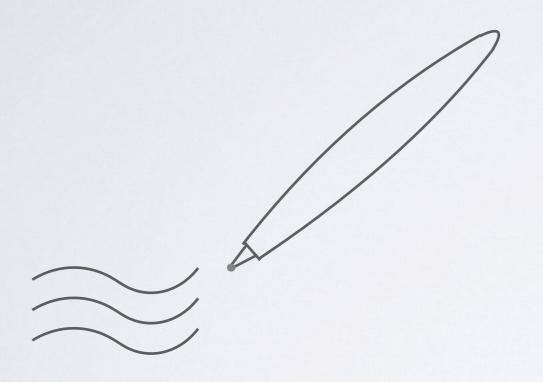
Recording information in hospital settings

In hospital

1.8.7

Record the items listed in recommendation 1.8.1, as a minimum, for the primary survey.

In hospital



1.8.8

One member of the trauma team should be designated to record all trauma team findings and interventions as they occur (take 'contemporaneous notes').



In hospital



1.8.9

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

In hospital

Sharing information in hospital settings

In hospital

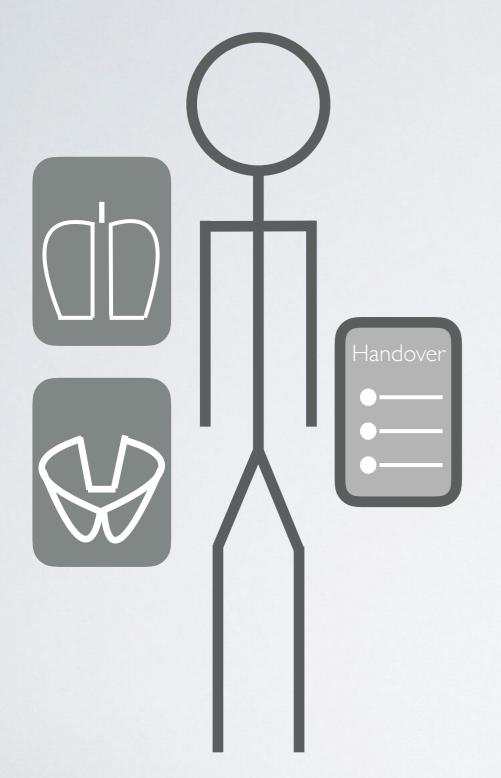
Handover

1.8.10

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.



In hospital

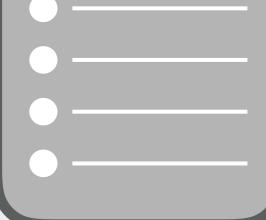


1.8.11

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

In hospital

Admission Summary



#### 1.8.12

Provide 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.

# 1.9 INFORMATION AND SUPPORT FOR PATIENTS, FAMILY MEMBERS AND CARERS

START

NICE Guideline on major trauma: service delivery

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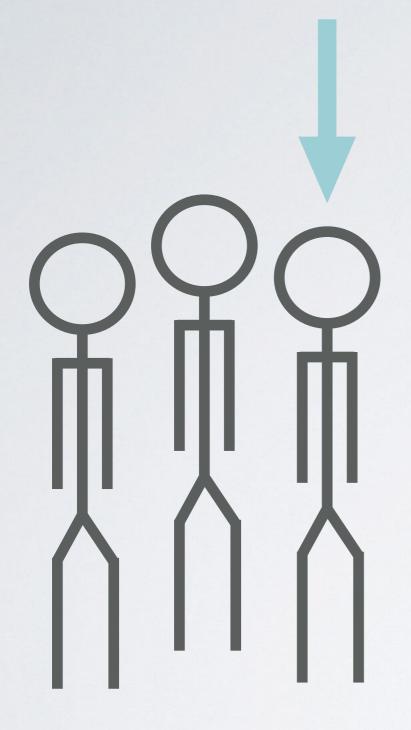
The NICE guideline on major trauma: service delivery contains recommendations for ambulance and hospital trust boards, senior managers and commissioners on support and information for patients, family members and carers.



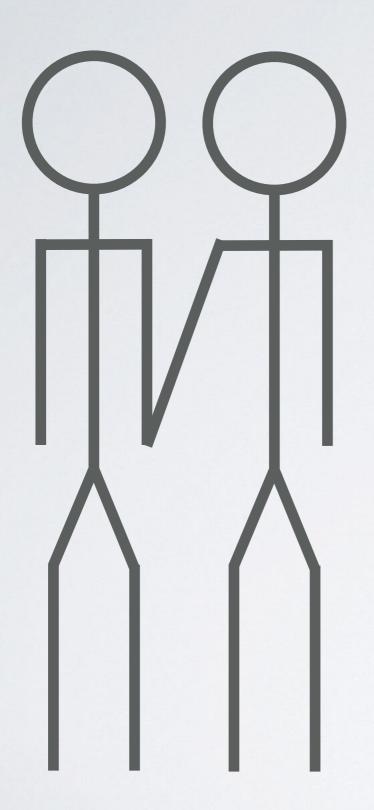
Providing support

When communicating with patients, family members and carers:

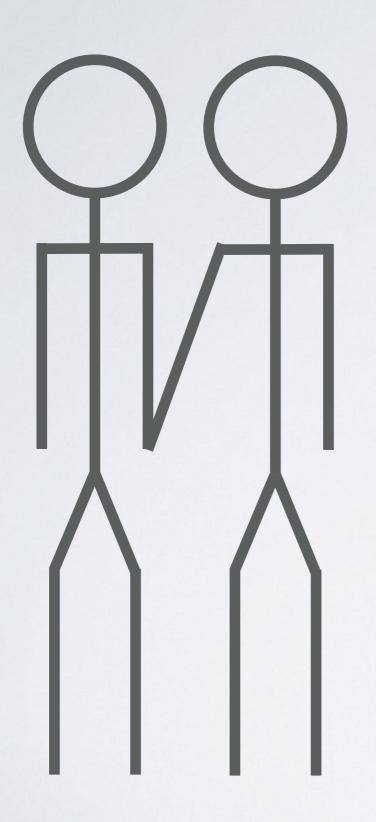
- manage expectations and avoid misinformation
- answer questions and provide information honestly, within the limits of your knowledge
- do not speculate and avoid being overly optimistic or pessimistic when discussing information on further investigations, diagnosis or prognosis
- ask if there are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



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



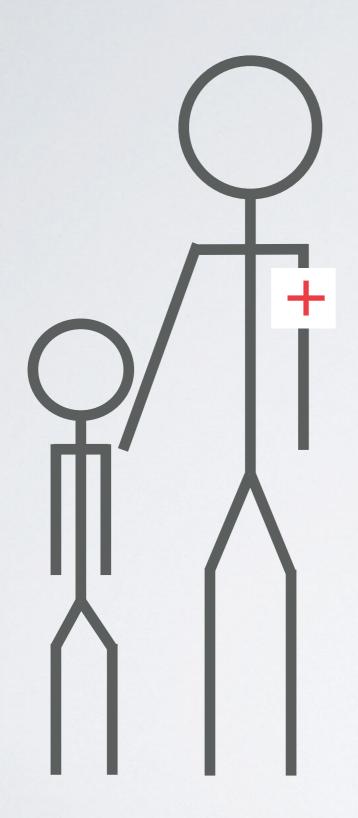
If possible, ask the patient if they want someone (a family member, carer or friend) with them.



If the patient agrees, invite their family member, carer or friend into the resuscitation room. Ensure that they are accompanied by a member of staff and their presence does not affect assessment, diagnosis or treatment.



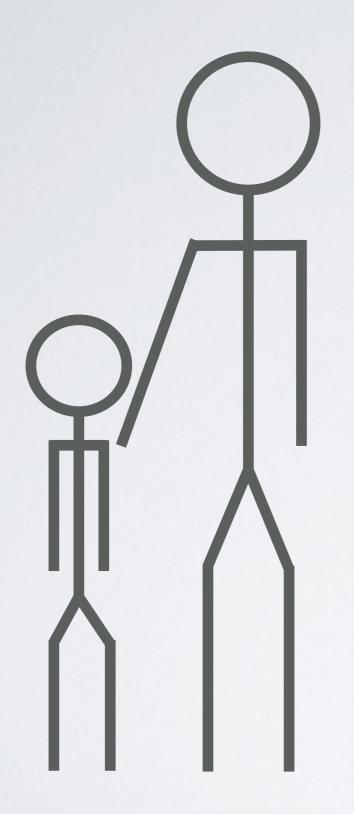
Support for children and vulnerable adults



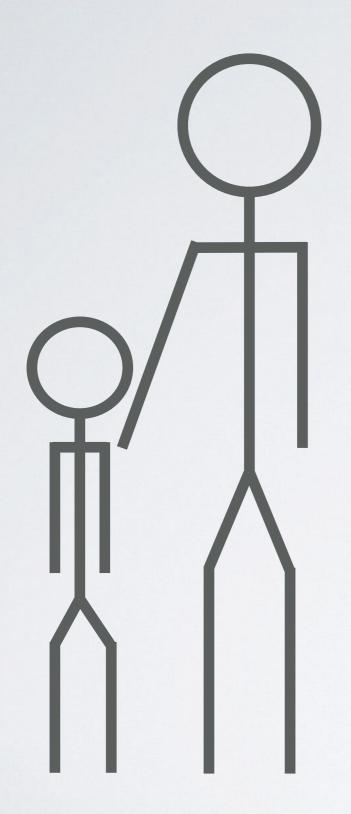
Allocate a dedicated member of staff to contact the next of kin and provide support for unaccompanied children and vulnerable adults.



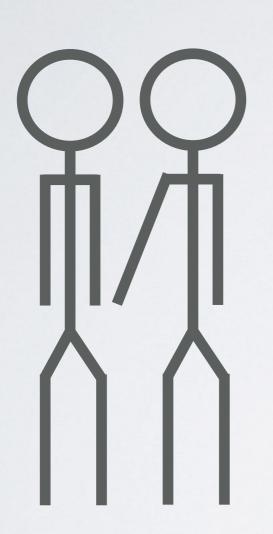
Contact the mental health team as soon as possible for patients who have a pre-existing psychological or psychiatric condition that might have contributed to their injury, or a mental health problem that might affect their wellbeing or care in hospital.



For a child or vulnerable adult with major trauma, enable their family members or carers to remain within eyesight if appropriate.

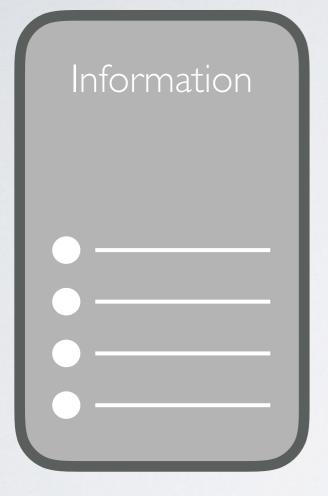


Work with family members and carers of children and vulnerable adults to provide information and support. Take into account the age, developmental stage and cognitive function of the child or vulnerable adult.



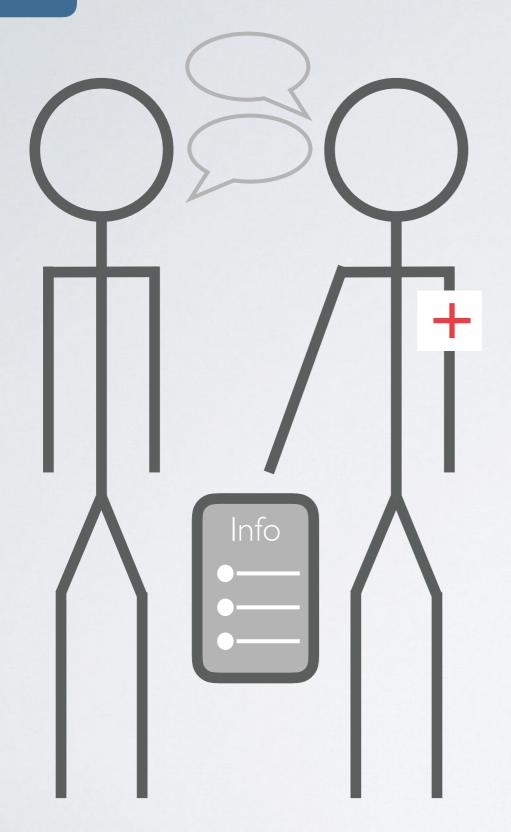
Include siblings of an injured child when offering support to family members and carers.

Providing information

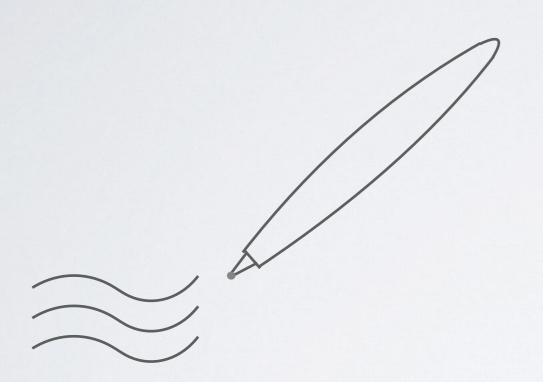


Explain to patients, family members and carers what is happening and why it is happening. Provide:

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



Provide information at each stage of management (including the results of imaging) in face-to-face consultations.



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

Providing information about transfer from an emergency department

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

- the reason for the transfer
- the location of the receiving centre and the patient's destination within the receiving centre
- the name and contact details of the person 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.

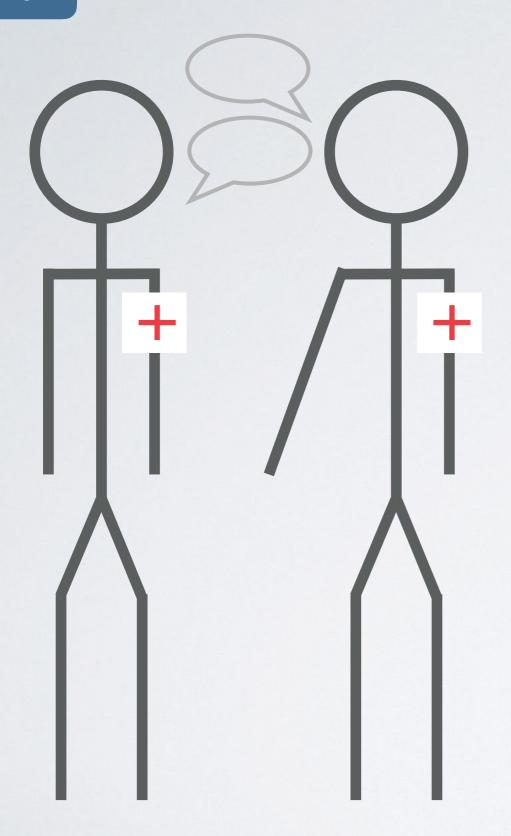
### I. IOTRAINING AND SKILLS

START

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

1.10.1

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



1.10.2

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



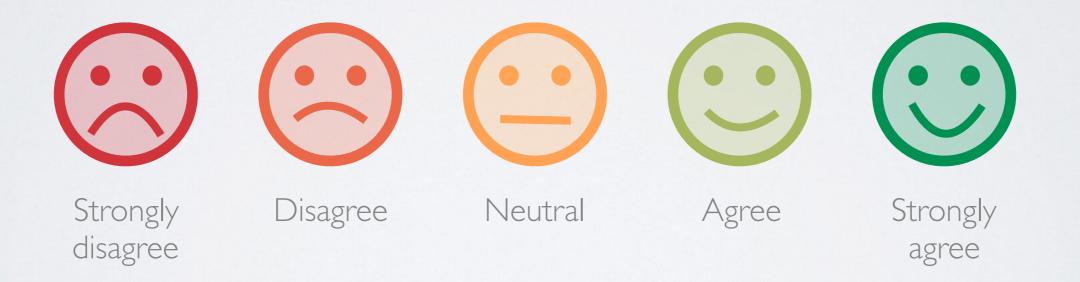
#### 1.10.3

Provide education and training courses for healthcare professionals who deliver care to children with major trauma that include the following components:

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

Please click below to answer to the following statement;

"This resource met my requirements".



## END

To access the full guideline follow this link <a href="http://www.nice.org.uk/guidance/ng39">http://www.nice.org.uk/guidance/ng39</a>

