Complex fractures

Information for the public
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About this information

NICE guidelines provide advice on the care and support that should be offered to people who use health and care services.

This information is for people who have complex fractures, their families and carers. Complex fractures are complicated breaks in bones which usually need care by a specialist team. They include open fractures (which are fractures with wound complications), pelvic fractures (breaks in the strong bony ring connecting the base of the spine to the hips) and severe ankle fractures.

The NICE guideline offers advice about how open fractures, pelvic fractures and severe ankle fractures should be managed. It does not cover every type of complex fracture in detail. Also it does not cover non-complex fractures, skull fractures, hip fractures and spinal injuries. For information about advice we have produced in these areas, see other NICE guidance.

The care team

A range of professionals who specialise in different areas of treatment or support may be involved in caring for people with complex fractures. These could include emergency doctors, surgeons, specialist nurses, people who take X-rays and scans (radiographers), people who advise on exercise and movement (physiotherapists) and people who help patients to regain their independence (occupational therapists).
Working with people who have complex fractures

The care team should talk to people with complex fractures. They should explain any tests, treatments or support that should be offered so that people can decide what is best for them. Families or carers can be involved in helping to make decisions, but only if the person agrees. Parents or carers may be involved in helping to make decisions for children, depending on a child's age. There is a list of questions to help with discussions with the care team.

NICE has also produced information for the public on what adults should be able to expect when they use the NHS. We also have more information on the NICE website about using health and social care services.

Some treatments or care described here may not be suitable. If treatment does not match this advice, people should talk to their care team.

Open fractures

Open fractures are breaks in a bone complicated by a wound or wounds. They are usually caused by vehicle accidents. People with open fractures usually have some treatment from ambulance staff at the scene of the accident. If an accident happens at home, people might be taken straight to an emergency department by friends or family.

Pain relief

If someone has a complex fracture, they should be checked regularly to see how much pain they are in. They should be given painkillers and have the dose adjusted until they are comfortable. The painkillers should be injected or given through a drip (directly into a vein through a tube and needle). If this isn't possible, they may be given as a spray up the nose.

Antibiotics

Because there is a risk of infection, it's important that people with open fractures are given antibiotics as soon as possible. This is usually within an hour of injury and is by injection or drip. Giving antibiotics shouldn't delay transport to hospital.
First steps in treatment

Photos of wounds

Having a photo of an open fracture can help healthcare professionals decide how to treat the injury. There must be a policy in place that says how these types of photos will be used and stored, and staff must follow the policy. Any photos of open fracture wounds should be kept in a person's medical records.

Dressings

NICE has said that some open fractures (leg and arm bones and some foot bones) should not be washed before treatment. But a dressing soaked in sterile salt water (saline) may be put on an open fracture to protect the wound before the fracture is treated.

Splints

People with fractures in the long bones in the leg may be given a 'splint' to keep the damaged leg stable when they are being taken to hospital. If the bone is broken above the knee, the other (adjacent) leg may be used as a splint.

Going to hospital

When people with open fractures are taken to hospital in an ambulance, the type of hospital they are taken to will depend on where the fracture is and the care that they need.

If someone needs to be treated by a surgeon and a plastic surgeon they should be taken to a specialist centre that can provide this care.

People with open fractures in the hands, wrists or toes can usually get the care they need at their nearest emergency department. But they should be taken to a centre that provides specialist care if this is what they need.
Management in hospital

CT scans

If there's concern that a person might have multiple injuries, they may be given a CT scan to help decide what treatment is needed. CT scans aren't used as often in children (under 16s) because of concerns about radiation from the scan and its effects in this age group.

Restoring blood flow to arms and legs (limbs)

Injuries may mean that blood is not getting through to an arm or a leg. If this is the case, doctors should work to restore the blood flow before they start to treat fracture wounds.

Fixing bones and repairing wounds

The first step in treating open fractures is removing the damaged tissue from around the wound. This is done in an operating theatre and is known as 'debridement'. If the open fracture is very dirty (contaminated), this should be done immediately. Otherwise damaged tissue should usually be removed within 12 hours and should be removed within 24 hours of injury. A temporary dressing may be put on the wound.

Surgeons can fix broken bones using wires, plates, screws or rods (known as internal fixation) or an external frame (known as external fixation). The wound then needs to be repaired to reduce the chance of infection. When possible all of these steps should be done during a single operation. When more than 1 operation is needed, the steps should be completed within 72 hours.

Damaged arms and legs (limbs)

Sometimes when an arm or leg (limb) is very badly damaged, it may need to be removed in an emergency operation. This type of operation may be needed if keeping the limb itself is a threat to life, for example, if bleeding from the limb can't be controlled or if surgery to save the limb would put the person's life at risk.

Sometimes a limb (or part of a limb) is removed after a full discussion and agreement by healthcare professionals, the person and their families and carers (as appropriate). When a decision has been made to do this type of operation, it should be done within 72 hours of injury.
Monitoring for compartment syndrome in people with shinbone fractures

The shinbone is one of the leg bones, and is also known as the tibia. Sometimes people with fractures of the shinbone develop painful and possibly serious bleeding and swelling in their muscles. This is known as compartment syndrome. Healthcare professionals should keep checking for compartment syndrome for 48 hours after someone fractures their shinbone. They should also tell people what signs to look out for when they go home from hospital.

Pelvic fractures

Pelvic fractures are breaks in the pelvis, which is the strong bony ring connecting the base of the spine to the hips. When someone breaks their pelvis because of a serious accident, they may also have internal bleeding and damage to nerves and internal organs. Because they are often linked to other internal injuries, pelvic fractures need very careful handling at the scene of the accident, during transport to hospital and on arrival at hospital.

Pain relief

If someone has broken their pelvis in a serious accident they should be given a painkiller with the dose adjusted until they are comfortable. The painkiller should be injected or given through a drip. If this isn't possible, it may be given as a spray up the nose.

Adults with pelvic fractures due to a less serious accident (such as a fall) should also be offered pain relief. But this will usually be paracetamol every 6 hours, with extra pain relief only if paracetamol isn’t enough on its own.

Pelvic binders

If healthcare staff at the scene of the accident think there may be internal bleeding from a broken pelvis, they should apply a pelvic binder. This is a wrap that goes around the top of the thighs and the bottom. Pelvic binders should be taken off within 24 hours to stop pressure sores from developing. Before a pelvic binder is removed, pelvic surgeons should agree how an unstable fracture is going to be managed.

Log rolling

Log rolling is a way of turning people over while making sure that their spine is kept in one position. Log rolling shouldn’t generally be used before a CT scan if someone is thought to have broken their
pelvis. However, there are exceptions: if there may be internal bleeding from an injury that’s not obvious without turning the person (for example, a stab wound) or a person needs turning to help them breathe (for example, because they are being sick).

Transport to hospital

If healthcare professionals think that someone might have a broken pelvis, they should take them to a hospital that can care for the injuries. This may be the nearest hospital. But people should be taken to a major trauma centre if there are signs that specialist care is needed.

People who have been taken to their nearest hospital should be transferred to a specialist centre within 24 hours of breaking their pelvis if it becomes clear that specialist treatment is needed. They should be transferred immediately if treatment is needed to stop bleeding.

People should also be transferred to a specialist centre immediately if treatment to fix a broken hip hasn’t worked and specialist skills are needed for further treatment.

Management in hospital

Scans

Adults (aged 16 or over) who might have broken their pelvis may have a type of scan called a CT scan to find out more about their injuries. CT scans aren’t used as often in children (under 16s) because of concerns about radiation from the scan and its effects in this age group. Children may have an X-ray (which exposes them to less radiation) unless a CT scan is needed for other injuries.

Stopping bleeding in the pelvis

Bleeding from injuries to the pelvis needs to be stopped as quickly as possible. This is done at a major trauma centre. Surgeons may operate to stop the bleeding or they may use a technique called ‘interventional radiology’. This is done through a small opening with a camera guiding the surgeon.

Severe ankle fractures

Severe ankle fractures in adults with damage to the weight-bearing surface of the joint are called pilon fractures. There are similar fractures in children, which affect the joint and the growing areas.
**Pain relief**

Adults with severe ankle fractures (pilon fractures) should be offered:

- paracetamol for mild pain
- paracetamol and codeine for moderate pain
- paracetamol by injection or a drip, with morphine as needed, for severe pain.

A type of drug called a non-steroidal anti-inflammatory drug (ibuprofen is an example of this) may be offered as well, except in frail people or older adults.

Children (under 16s) should be offered:

- either paracetamol or ibuprofen, or both, or
- a stronger painkiller called an opioid; this is usually given by injection or drip, but it may be given as a spray up the nose.

**Management**

Healthcare professionals should have a clear plan for managing severe ankle fractures within 24 hours. Discussions about managing these injuries in children should involve a children's specialist. Any early surgery in adults should be done within 24 hours of injury. Transfer to a specialist centre may be needed if the local centre can't do the surgery or offer the care needed.

**Information and support**

**At the hospital**

After someone arrives at hospital with a complex fracture, if possible they should be asked if they would like a family member, carer or friend with them.

The hospital staff should explain:

- what the injuries are
- the possible tests and treatments, and when these are likely to be done.
**Children and adults who may need extra support**

If the person who is injured is a child or adult who might need extra support (for example, because they have a learning disability or dementia), a member of the hospital staff should be assigned to look after them and to contact their families or carers. If possible, parents and carers should be able to stay where the person who is injured can see them. Staff should work with family members and carers to explain injuries and treatment in a way that the person with the injuries can understand. Brothers and sisters of any children who are injured should also be included when support is offered to the family.

**Support during treatment**

Once a treatment plan has been agreed, hospital staff should explain and give some written information about:

- how long they think it might take to recover from the injuries
- when or if the person is likely to be able to return to their normal activities
- whether they will recover fully or might have permanent effects.

They should also give information about:

- how much weight should be put on the injured bone
- things the person can do to help them recover (including who to contact for more advice about this)
- any help the person might be able to have in their home.

They should ask if the person has any questions and answer these honestly. Staff should make sure that they know what information has already been given to avoid any confusion. People should be able to see any pictures of their injury taken before and after treatment if they want to.

Some treatments for broken bones are often done while a person is awake with numbing of the part of the body being treated with a local or regional anaesthetic. Healthcare staff should reassure people during these types of procedures.
When moving to another hospital

If the person who is injured is moving to another hospital, they should be told where they are going, why they are being moved there and who will be responsible for their care at the new hospital (including their contact details). They should be given some written information about this. The name and contact details of the person who was responsible for their care at the first hospital should also be written down for them.

Hospital records

When people are moved to a ward or another hospital, their hospital records, including any photos of their wounds, should be sent with them.

Hospital staff should write a description of the injuries, plans for treatment and how they expect the person to recover. It should include a short summary that people and their families and carers can understand. Hospital staff should send this to the person's GP within 24 hours of admission to hospital.

Questions to ask

These questions may help people with complex fractures and their families or carers to find out important information from the healthcare team.

- Have my family/next of kin been informed?
- How long will I be in hospital?
- How long before I can go back to my usual activities?
- Will I have permanent effects from my injuries?
- How will my injuries affect me in the long term?
- Will I need long-term treatment for my injuries? If so, who will provide that treatment?

Sources of advice and support

- St John Ambulance
  www.sja.org.uk
Complex fractures

- British Red Cross
  www.redcross.org.uk

- Pain Concern, 0300 123 0789
  www.painconcern.org.uk

- National Osteoporosis Society, 0808 800 0035
  http://stopatone.nos.org.uk

- Limbless Association, 0800 644 0185
  www.limbless-association.org

You can also go to NHS Choices for more information.

NICE is not responsible for the quality or accuracy of any information or advice provided by these organisations.

Other NICE guidance

- Fractures (non-complex): assessment and management (2016) NICE guideline NG38

- Major trauma: assessment and initial management (2016) NICE guideline NG39

- Spinal injury: assessment and initial management (2016) NICE guideline NG41

- Major trauma: service delivery (2016) NICE guideline NG40

- Head injury: assessment and early management (2014) NICE guideline CG176

- Hip fracture: management (2011) NICE guideline CG124

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