

## MECHANISMS OF INJURY

The injury that a person sustains is directly related to how it is caused. In addition, whether a casualty sustains a single or multiple injury is also determined by the mechanisms that caused it. This is the reason why a history of the incident, and therefore the injury mechanism is important. In many situations, this vital information can only be obtained by those people who deal with the casualty at the

scene – often first aiders. Look, too, at the circumstances in which an injury was sustained and the forces involved.

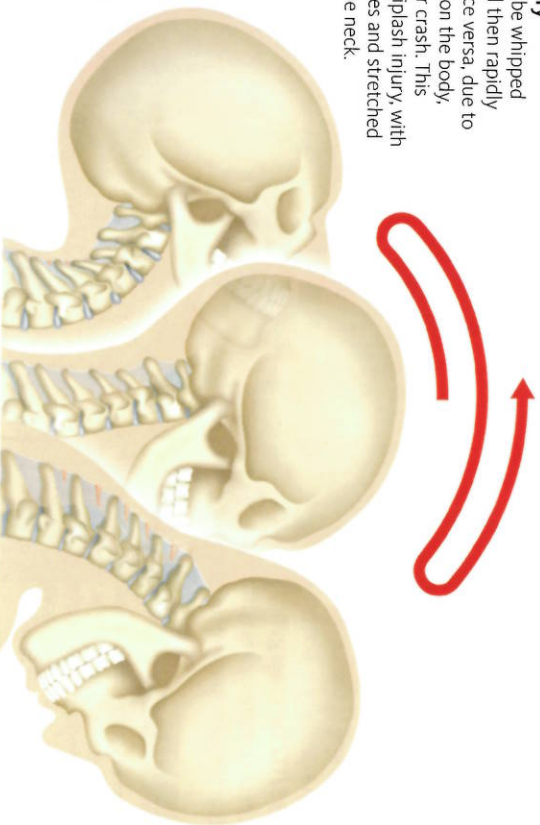
The information is useful because it also helps the emergency services and medical team predict the type and severity of injury, as well as the treatment required. This therefore helps the diagnosis, treatment and likely outcome for the casualty.

### CIRCUMSTANCES OF INJURY

The extent and type of injuries sustained due to impact – for example, a fall from a height or the impact of a car crash – can be predicted if you know exactly how the incident happened. For example, a car occupant is more likely to sustain serious injuries in a side-impact collision than in a frontal collision at the same speed. This is because the side of the car provides less protection and cannot absorb as much energy as the front of the vehicle. For a driver wearing a seatbelt whose vehicle is struck either head-on

or from behind, a specific pattern of injuries can be suspected. The driver's body will be suddenly propelled one way, but the driver's head will lag behind briefly before moving. This results in a "whiplashing" movement of the neck (below). The casualty may also have injuries caused by the seatbelt restraint; for example, fracture of the breastbone and collarbone and possibly bruising of the heart or lungs. There may also be injuries to the face due to contact with the steering wheel or an inflated airbag.

**Whiplash injury**  
The head may be whipped backwards and then rapidly forwards, or vice versa, due to sudden forces on the body, such as in a car crash. This produces a whiplash injury, with strained muscles and stretched ligaments in the neck.



### FORCES EXERTED ON THE BODY

The energy forces exerted during an impact are another important indicator of the type or severity of any injury. For example, if a man falls from a height of 1m (3ft 3in) or less on to hard ground, he will probably suffer bruising but no serious injury. A fall from a height of more than 2m (6ft 6in), however, is likely to produce more serious injuries, such as a pelvic fracture and internal bleeding. An apparently less serious fall can mask a more dangerous injury. If a person

falls down the stairs, for example, she may tell you that she injured her ankle. If she has fallen awkwardly on to a hard surface, however, she may have sustained a spine and/or head injury. A fall down more than five stairs is associated with a greater risk of injury, than a fall down fewer than five stairs. Be aware too that the elderly or those suffering from bone disorders such as osteoporosis are at greater risk of serious injury from minor knocks or falls.



#### Most serious injury may be hidden

A first aider should keep the casualty still, ask someone to support her head and **call 999/112 for emergency help.**

### QUESTIONS TO ASK AT THE SCENE

- When you are attending a casualty, ask the casualty, or any witnesses, questions to try to find out the mechanism of the injury. Witnesses are especially important if the casualty is unable to talk to you. Possible questions include:
- Was the casualty ejected from a vehicle?
  - Was the casualty wearing a seat-belt?
  - Did the vehicle roll over?
  - Was the casualty wearing a helmet?
  - How far did the casualty fall?
  - What type of surface did he land on?
  - Is there evidence of body contact with a solid object, such as the floor or a vehicle's windscreen or dashboard?
  - How did he fall? (For example, twisting falls can stretch or tear the ligaments or tissues around a joint such as the knee or ankle.)
- Pass on all the information that you have gathered to the emergency services (pp.21 and 23).