



# Concussion

## DESCRIPTION

A concussion is a violent jar or shock to the brain causing an immediate change in brain function, including a possible loss of consciousness. The effects of a concussion are usually temporary, but they may be cumulative; the more often a person sustains concussions, the more long-term effects will result, such as slurred speech, slow movements, slow thought processes, and tremors. Concussions are usually graded based on the length and severity of the change in brain function.

## COMMON SIGNS AND SYMPTOMS

Symptoms depend on the extent of the injury. The presence or absence of swelling at the injury site is not related to the seriousness of the injury.

Mild concussion:

- Temporary loss of consciousness
- Memory loss (amnesia) of short duration
- Emotional instability

Severe concussion:

- Usually prolonged loss of consciousness
- Pupils of different size
- Changes in vision, including blurring
- Changes in breathing
- Disturbed equilibrium (balance)
- Headaches

## CAUSES

Concussions are caused by an injury or blow to the head. The worst concussions are caused by high-energy impacts, such as with motor vehicle accidents. Although more severe injuries are incurred when helmets are not worn, an individual can receive a concussion even with a helmet.

## FACTORS THAT INCREASE RISK

- Contact sports, especially football, martial arts, or boxing
- Riding bicycles, motorcycles, or horses without a helmet

## PREVENTIVE MEASURES

- Wear proper protective headgear and ensure correct fit.
- Do not drink or use mind-altering drugs before driving a vehicle.

## EXPECTED OUTCOME

Concussion is usually curable with early recognition and medical treatment. Complications can be life threatening and may cause permanent disability, brain damage, and death.

## POSSIBLE COMPLICATIONS

- Permanent brain damage, depending on the extent of injury; repeated concussions can cause slurred speech, slow movement, slow thought processes, and tremor.
- Bleeding under the skull (subdural hemorrhage or hematoma, epidural hematoma)
- Bleeding into the brain
- Prolonged healing time if usual activities are resumed too soon
- Infection if skin over the concussion site is broken
- Susceptibility to repeated concussions; often less trauma or force is required to cause a second concussion than is necessary to cause the first. After one concussion, an athlete is four times more likely to sustain a second concussion.
- Death from *second impact syndrome* following a return to sports before all symptoms have completely disappeared; even a *minor* second injury that occurs before all symptoms have disappeared can cause sudden, massive, irreversible swelling of the brain, resulting in death.

## GENERAL TREATMENT CONSIDERATIONS

The initial treatment includes an immediate evaluation, occasionally requiring hospitalization for observation, and treatment as needed. If the patient is to be watched at home, the patient should be awakened every 1 to 2 hours for 24 hours or as recommended. Report to the physician immediately if you cannot awaken or arouse the person, and report any of the following:

- Vomiting
  - Inability to move arms and legs equally well on both sides
  - Temperature above 100 °F (37.8 °C)
  - Neck stiffness
  - Pupils of unequal size, shape, or reactivity
  - Convulsions
  - Noticeable restlessness
  - Severe headache that persists for longer than 4 hours after injury
  - Confusion, disorientation, or mental status changes
- Avoid exertion; bed rest for the first 24 to 48 hours is recommended.

## 260 CONCUSSION

Return to play is a controversial subject and should be discussed at length with your treating physician. Factors such as the length of time of unconsciousness, amnesia and other altered brain functions, and whether this is the first, second, or third concussion all play a role in timing a patient's return to sports.

### MEDICATION

Do not give any medicine, including nonprescription acetaminophen or aspirin, until the diagnosis is certain, because these may mask developing symptoms.

### WHEN TO CALL YOUR DOCTOR

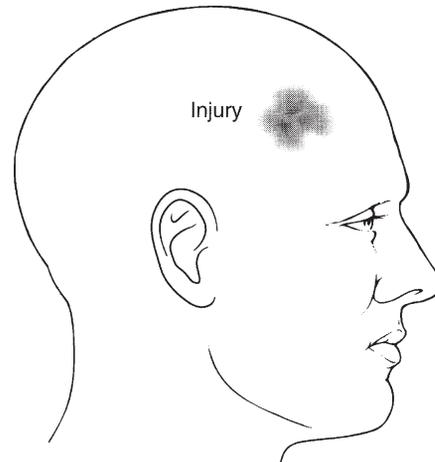
- Symptoms get worse or do not improve in 24 hours.
- Any of the following symptoms occur:
  - Vomiting
  - Inability to move arms and legs equally well on both sides
  - Temperature above 100 °F (37.8 °C)
  - Neck stiffness
  - Pupils of unequal size, shape, or reactivity

Convulsions

Noticeable restlessness

Severe headache that persists for longer than 4 hours after injury

Confusion, disorientation, or mental status changes



**FIGURE 1**