

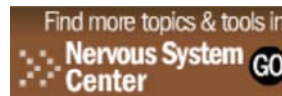
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NERVOUS SYSTEM



Dec 31, 2005

Concussion

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Overview

Your brain floats within your skull surrounded by cerebrospinal fluid (CSF). One of the functions of CSF is to cushion the brain from light bounces of everyday movement. However, the fluid may not be able to absorb the force of a sudden hard blow or a quick stop.

A concussion is a temporary loss of awareness or consciousness caused by a blow to the head. Severe blows may result in bleeding in the head or permanent damage to nerves. Some concussions can have serious, lasting effects.

Most concussions are mild and most people with mild brain injuries recovery fully, but the healing process takes time. Rest is the best recovery technique.

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Signs and symptoms

The signs and symptoms of a concussion can be subtle and may not appear immediately. Symptoms can last for days, weeks or longer.

Your behavior, mental ability and physical skills all are linked to specific areas of your brain. The severity and side effects of a head injury depend greatly on which area of your brain was most affected.

Immediate signs and symptoms of a concussion may include:

- Confusion
- Amnesia
- Headache
- Loss of consciousness
- Ringing in the ears (tinnitus)
- Drowsiness
- Nausea
- Vomiting
- Unequal pupil size
- Convulsions
- Unusual eye movements
- Slurred speech

Delayed signs and symptoms may include:

- Irritability
- Headaches
- Depression
- Sleep disturbances, including insomnia or difficulty waking
- Fatigue
- Poor concentration
- Trouble with memory
- Getting lost or becoming easily confused
- Increased sensitivity to sounds, lights and distractions
- Loss of sense of taste or smell
- Difficulty with gait or in coordinating use of limbs

If you experience any of these signs and symptoms after suffering head trauma, see your doctor.

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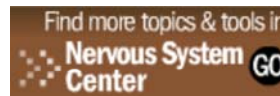
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Causes

A violent blow to your head can cause your brain to slide forcefully against the inner wall of your skull. This can result in bleeding in or around your brain and the tearing of nerve fibers.

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Concussion

A concussion causes at least a temporary loss in brain function. Although losing consciousness is a common sign of a concussion, it's possible to suffer a concussion without being completely knocked out.

More-serious injuries to the brain include:

- Bruising and swelling of your brain (contusion)
- A broken skull bone (skull fracture)
- A blood clot in or around your brain (hematoma)

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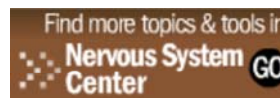
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Risk factors

Although many concussions result from sports injuries, they can occur whenever your head is subjected to a blow, such as in a car accident or from a fall. Some common risk factors include:

- **Not wearing protective headgear during recreational activities.** Many head injuries are preventable. Unfortunately, people don't always use some of the simplest safety measures, such as wearing a helmet while biking, skating, snowboarding or skiing.
- **Playing sports, especially competitive team sports.** Mild to moderate brain injuries, including concussions, are common injuries among athletes. Ice hockey, football and boxing have the highest rates of concussion among male athletes, although those who play rugby and soccer are also at risk. Among female athletes, those who participate in tae kwon do are at greatest risk of concussion.
- **Traffic accidents.** The sudden force or sudden stop involved in a traffic accident may bruise your brain.
- **Falls.** A fall, such as from a bicycle, can result in your striking your head and exerting tremendous force on your brain.
- **Having a previous concussion.** Previous head trauma seems to make a person more susceptible to future problems.

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- [Use your head: Wear a bicycle helmet](#)

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When to seek medical advice

Seek medical advice after any blow to your head in which you have the signs and symptoms of a concussion. Although symptoms may not be immediately apparent, be sure to watch closely for subsequent physical, mental and emotional changes.

In addition, tell a family member or a close friend if you have head trauma. Because memory loss may be associated with a blow to the head, some people may forget they ever hit their head until after the diagnosis and sometimes the treatment. A friend, family member or co-worker may be more likely to recognize the warning signs and arrange for prompt medical attention if he or she is aware of the situation.

Some people experience postconcussion syndrome, a condition in which the symptoms of concussion persist for weeks or months after the initial head trauma. If you have had a concussion and continue to have symptoms such as memory and concentration problems, headaches, dizziness, confusion or irritability, see your doctor.

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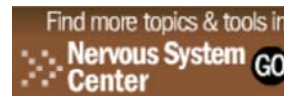
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Screening and diagnosis

Diagnosing a concussion may involve several steps. Your doctor may ask questions about the accident and may conduct a neurological exam. This exam includes checking your memory and concentration, vision, hearing, balance, coordination and reflexes. Depending on the results of the neurological exam, your doctor may request one of these tests:

- **Computerized tomography (CT) scan.** A CT scan uses a sophisticated X-ray machine linked to a computer to produce detailed, two-dimensional images of your brain. You lie still on a movable table that's guided into what looks like an enormous doughnut-shaped X-ray machine where the images are taken. A CT scan is painless and generally takes less than 10 minutes.
- **Magnetic resonance imaging (MRI) scan.** This scan uses magnetic fields and radio waves to generate images of the brain. You lie inside a cylindrical machine for 15 minutes to an hour while the images are made. Although it's painless, some people feel claustrophobic inside an MRI scanner.

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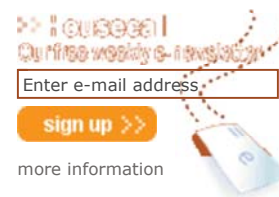
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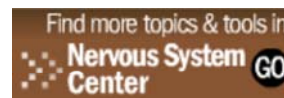
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Complications

If you've experienced a concussion, it's common not to remember the events right before, during and immediately after your injury. Memory of these events may never come back. After recovery, however, your ability to learn and remember new things almost always returns.

It's important to prevent a condition known as second impact syndrome. This occurs when a person has recurrent head trauma while still recovering from a concussion. A seemingly minor trauma or bumping of the head in these people can lead to devastating swelling of the brain, which could prove fatal. You're at greatest risk of second impact syndrome if you're younger than age 20.

After a concussion, always get your doctor's OK before returning to a sport. Wait until all of your neurological symptoms have completely gone away.

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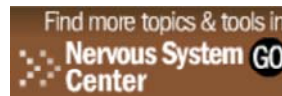


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Treatment

Rest is the best recovery technique. Healing takes time. Some over-the-counter and prescription drugs may relieve headache pain, but talk to your doctor before taking any medications, especially aspirin. Aspirin may contribute to bleeding. Don't give aspirin to children because it may lead to serious problems, such as Reye's syndrome.

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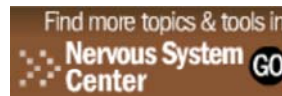
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Prevention

The following tips may help you to prevent or minimize your risk of head injury:

- **Wear a helmet during recreational activities.** When bicycling, motorcycling, skiing, horseback riding, skating or engaging in any recreational activity that may result in head injury, wear protective headgear. Wearing a bicycle helmet greatly reduces your risk of serious head injury and brain injury.
- **Buckle your seat belt.** Wearing a seat belt may prevent serious injury, including an injury to your head, during a traffic accident.
- **Wear safety equipment while participating in competitive team sports.** Properly fitting and appropriate safety equipment may protect you from injury during the contact that's involved in many sports.
- **Make your home fall proof.** Keep your home well lit and free of situations that might cause you to trip and fall. Falls around the home are the leading cause of head injury for infants, toddlers and older adults.
- **Protect your children.** To help lessen the risk of head injuries to your children, pad countertops and edges of tables, block off stairways, and keep your children from climbing on unsafe or unsteady objects.
- **Wear sensible shoes.** If you're older, wear thinner, hard-soled, flat shoes. Resilient-soled athletic shoes may impair your balance and contribute to falls. Avoid wearing high heels, sandals with light straps, or shoes that are either too slippery or too sticky.

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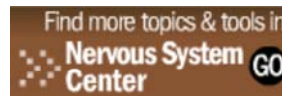


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Coping skills

The process of healing from a concussion may take time, sometimes several months. These tips may help make for a smoother recovery:

- Get plenty of sleep at night and rest during the day.
- Return to normal activities gradually. Don't take on too much too soon.
- Avoid activities that could result in a second head injury, such as contact or recreational sports, until your doctor says you're well enough to participate.
- Be sure to ask your doctor about when you can safely return to sports, drive a car, bike, or operate other equipment or machinery. Your ability to react to stimuli may be impaired.
- Take only medications that your doctor has prescribed or approved.
- Don't drink alcohol until you have recovered fully. Alcohol may hinder recovery and can put you at risk of further injury.
- Write down things that you find hard to remember.
- Consult with your family or close friends before making important decisions.

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