

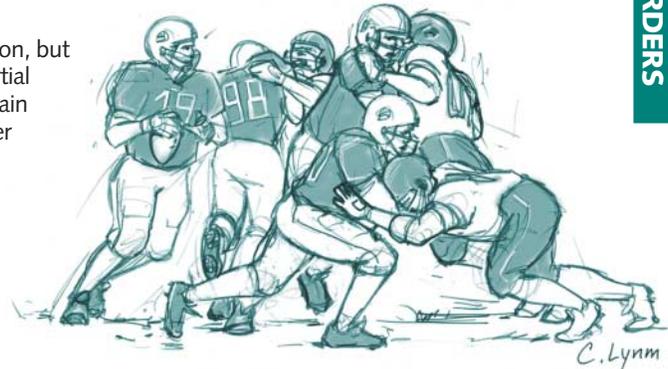
# Concussion

**C**oncussion (or mild traumatic brain injury) is a brain injury caused by blunt head trauma. In the United States, concussion affects more than 1 million individuals each year. The July 6, 2011, issue of *JAMA* contains an article on concussion.

## CAUSES

Motor vehicle accidents are the most common cause of concussion, but it may also result from active contact sports (such as boxing, martial arts, and football), extreme sports (such as rock climbing, mountain biking, alpine skiing, and professional snowboarding), some other recreational activities (such as horseback riding and ice skating), and household falls. Also, some genetic traits have been connected to risk of concussion.

The direct cause of concussion is rapid **acceleration-deceleration** (speeding up and slowing down) at the time of the blow to the head, leading to jarring of the brain inside the skull and stretching the **neurons** (nerve cells) so that they temporarily do not work properly.



## SYMPTOMS

- Headache
- **Disorientation** (confusion)
- **Temporal amnesia** (lack of memory of events before and after the trauma) or other memory problems
- Altered level of consciousness (sleepiness, difficult to arouse) or **unconsciousness** (blackout)
- Nausea and vomiting
- Ringing in the ears
- Difficulties with speech, balance, judgment, or coordination
- Difficulties with concentration and learning
- Difficulty sleeping

The severity of concussion is graded based on the length of amnesia and unconsciousness.

## DIAGNOSIS AND TREATMENT

Symptoms of concussion develop immediately after the injury and should be assessed as quickly as possible. Alertness, orientation, memory, and neurological status are evaluated first. In some cases, this may be followed by diagnostic procedures of the head such as computed tomography (CT) or magnetic resonance imaging (MRI) to exclude rare but dangerous complications (such as skull fracture, brain swelling, or bleeding). Postconcussion clinical assessment should be repeated until the symptoms fully resolve.

Rest with gradual return to normal physical and sports activities is important for full recovery. Headaches and muscle pains are treated with medication such as acetaminophen (which is usually preferred over ibuprofen to reduce the risk of bleeding). In more severe cases of postconcussion syndrome, **cognitive behavioral therapy** (a type of psychological therapy) may be helpful. Prevention of a second injury during recovery is important because having a concussion increases the risk of a second concussion by 5 times, and a second concussion soon after the first increases the risk of dangerous brain swelling.

## PROGNOSIS

Concussion is a self-limited disease, with symptoms usually resolving within 2 to 6 weeks. However, if symptoms persist or new symptoms (such as increasing headaches, vomiting, confusion, or seizure) develop, you should immediately seek help from your doctor since these symptoms could indicate development of more serious brain injury.

## PREVENTION

Attention to safety, making your home safe, wearing a seatbelt while in a car, and wearing a properly designed helmet during sports activities are crucial to preventing concussion.

## FOR MORE INFORMATION

National Library of Medicine  
[www.nlm.nih.gov/medlineplus/ency/article/000799.htm](http://www.nlm.nih.gov/medlineplus/ency/article/000799.htm)

## INFORM YOURSELF

To find this and previous JAMA Patient Pages, go to the Patient Page link on *JAMA*'s Web site at [www.jama.com](http://www.jama.com). Many are available in English and Spanish.

Sources: The National Library of Medicine at the National Institutes of Health

Ryszard M. Pluta, MD, PhD, Writer

Cassio Lynn, MA, Illustrator

Robert M. Golub, MD, Editor

The JAMA Patient Page is a public service of *JAMA*. The information and recommendations appearing on this page are appropriate in most instances, but they are not a substitute for medical diagnosis. For specific information concerning your personal medical condition, *JAMA* suggests that you consult your physician. This page may be photocopied noncommercially by physicians and other health care professionals to share with patients. To purchase bulk reprints, call 312/464-0776.

