

## FACT SHEET

# Reducing Work-Related Traumatic Brain Injury Risk

*This WorkCare Fact Sheet describes traumatic brain injury risk, symptoms, emergency response, treatment and—most importantly—prevention.*

The 2015 movie, *Concussion*, has renewed national interest in the prevention of brain injuries.



## Traumatic Brain Injury Risk

In many cases, traumatic brain injury (TBI) is preventable, yet it is one of the most common, costly and disabling injuries in the United States, according to the [Centers for Disease Control and Prevention](#). TBIs annually account for approximately 2.2 million emergency department visits, 280,000 hospitalizations and 50,000 deaths.

At work and in the general population, falls are the leading cause of TBI across all age groups. Work-related falls frequently involve slippery, cluttered or unstable walking/working surfaces; unprotected edges; floor holes and wall openings; unsafely positioned ladders; and misused fall protection, according to studies

conducted by the National Institute for Occupational Safety and Health.

Other common injury causes at work include being hit by a moving object, bumping against a fixed object such as a cabinet or overhang, and vehicle crashes, which are the second leading cause of TBI-related deaths nationwide.

Failure to wear a helmet, use recommended fall protection, buckle a seat belt, secure loose objects and take precautions to prevent slips and falls significantly heightens injury risk. Gender also may be a risk factor: Men have significantly higher rates of TBI-related injuries and fatalities than women.

The following statistics are reported in [Case Identification of Work-Related Traumatic Brain Injury Using the Occupational Injury and Illness Classification System](#), a study published in the *Journal of Occupational and Environmental Medicine*, Vol. 55, No. 5, May 2013:

- TBI accounted for 22 percent of all work-related injury fatalities and 46 percent of work-related fatal falls between 2003 and 2008.
- Nearly 20 percent of reported work-related injuries involved TBI in a study using data obtained from the Washington State Trauma Registry and workers' compensation claims maintained by the Washington Department of Labor and Industries. In the Washington study, by cause of injury, 36.7 percent of motor vehicle traffic incidents and 25.4 percent of falls involved TBI. Among all work-related fatalities, 59.5 percent involved TBI.

## What is Chronic Traumatic Encephalopathy?



The movie, *Concussion*, tells the story of Bennet Omalu, M.D., a forensic neuropathologist who discovered a connection between repeated brain trauma in professional football players and an Alzheimer's-like disease called chronic traumatic encephalopathy (CTE).

According to the [Alzheimer's Association](#), investigations into the causes of CTE are ongoing. The association reports:

- Emerging evidence suggests individuals who have experienced repeated multiple blows to the head, such as professional athletes and combat veterans, are at higher risk of developing CTE than individuals who have not experienced repeated concussions.
- In boxing, CTE symptoms have been referred to as dementia pugilistica or "punch-drunken syndrome." The risk of CTE in boxers seems most closely tied to the number of rounds boxed, not the number of knockouts experienced, suggesting that repeated blows to the head that don't cause unconsciousness may increase CTE risk.
- Consensus has not been reached on the symptoms of CTE. Possible signs include memory loss, confusion, lack of concentration, loss of balance and motor skills, and personality changes such as aggression, erratic behavior and depression.

Strains and sprains typically are associated with slips, trips and falls. However, rising fall rates are also believed to contribute to TBI risk. The Bureau of Labor Statistics reports that the rate of falls on the same level in private industry increased to 16.6 per 10,000 full-time workers in 2014, up from 15.4 in 2013. In transportation and warehousing the rate of falls on the same level increased from 28.3 in 2013 to 30.4 in 2014. The rate of falls on the same level also increased in wholesale trade, health care and social assistance, and manufacturing sectors.

## TBI Signs and Symptoms

A TBI is caused by a bump, blow, jolt or blast impact to the head, or a penetrating wound. Injury severity may range from mild (brief change in mental status or consciousness) to severe (extended period of unconsciousness or amnesia). A concussion, one of a number of types of brain injuries, is usually caused by a blow to the head. It also may be caused by violent shaking or a whiplash-type movement.

Signs and symptoms of brain injury include:

- Inability to remember the cause or events that occurred immediately before or after the incident
- Confusion and disorientation
- Short-term memory loss
- Headache
- Dizziness
- Blurred vision
- Slurred speech
- Nausea and vomiting
- Ringing in ears
- Changes in emotions
- Sleep disruption
- Feeling dazed or in a fog
- Listlessness or fatigue

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Delayed onset symptoms may include:

- Concentration and memory complaints
- Irritability, aggression, mood swings and other personality changes
- Sensitivity to light and noise
- Sleep disturbances
- Psychological adjustment problems
- Depression
- Disorders of taste and smell

Certain types of traumatic brain injury may increase the risk of developing Alzheimer's disease or other types of dementia years after the injury takes place.

### Emergency Response, First Aid and Treatment



Call emergency services for anyone who loses consciousness or who experiences seizures, repeated vomiting or symptoms that seem to worsen. Also seek emergency care for anyone whose head was injured in a vehicular accident or who fell from a height of more than 3 feet. Check for emergency response signs such as

unequal pupils, weakness on one side of the body, dizziness, confusion, severe drowsiness, neck pain or slurred speech.

If you or someone you're with experiences an impact to the head and develops TBI symptoms, seek medical advice. When symptoms seem mild or are not clearly apparent, or there was no loss of consciousness, a brain injury may still have occurred.

First aid may include applying ice wrapped in a cloth to the head and having the person rest quietly. An over-the-counter pain medication may be recommended for headache.

Adults with a concussion are advised to rest their brain physically and cognitively and avoid vigorous activity until symptoms abate. Consult a physician for guidance on the performance of essential job functions and before returning to a sport or other activity that could cause another concussion before the brain is healed.

Severe brain injury requires hospitalization and rehabilitation. In some cases, surgery may be necessary. A severe injury can permanently affect brain function, speech, hearing and vision, and the ability to work and perform routine life activities such as driving and cooking.

### How Does the Brain Get Bruised?

On impact, the brain bumps into the interior of the skull where it is hit, as well as on the opposite side, resulting in damaging bruises at two sites in the brain. Such injuries can cause a number of short- and long-term effects.



## Prevention



Injuries may be prevented and severity reduced by the selection and use of a helmet and other personal protective equipment appropriate for the job. This includes wearing slip-resistant footwear, obeying warning signs and taking added precautions when working and walking on wet, icy and uneven surfaces.

The Occupational Safety and Health Administration's Personal Protective Equipment standard, [29 CFR, Part 1910.135 on head protection](#), requires employers to ensure that employees wear a protective helmet whenever there is a potential for head injury. Head protection must comply with American National Standards Institute consensus standards, as outlined in the rule. Helmets must resist penetration, absorb the shock of a blow and protect against electrical shock.

Federal regulations and industry consensus standards provide specific measures and performance-based recommendations for fall prevention and protection. The Walking/Working Surfaces Standard, [29 CFR 1910.22\(a\)\(1\)](#), requires employers to keep all places of employment clean and orderly and in a sanitary condition.

It also is important to your buckle seatbelt, properly secure objects that could fall from a height, and follow lockout/tagout rules for valves and other devices under pressure.

Successful reduction of TBI injury and fatality rates depends on a collaborative approach to improve workplace health and safety and provide continuous workforce education, occupational health and safety experts say.

## Recommended Resources

1. [Brain Injury Association of America](#); the association also has state affiliates that provide localized resources.
2. [HEADS UP to Brain Injury](#), a website with information for parents, coaches, teachers and medical professionals with sports-specific safety tips and activity-related helmet fact sheets.
3. [Journal of Head Trauma Rehabilitation](#), special May/June 2015 issue highlights the need for strategies to prevent TBI and reduce physical, psychological, economic and social impacts.
4. [Report to Congress on Traumatic Brain Injury Epidemiology and Rehabilitation: Recommendations for Addressing Critical Gaps](#), March 2015.