

facts on

Concussion in Children Under the Age of 6

What is a Concussion?

A concussion is an injury to the brain that changes or interferes with the way the brain works, usually temporarily. Concussions are also known as mild traumatic brain injuries. The diagnosis of a concussion is a clinical diagnosis based on symptoms and signs because there are currently no known biological markers that are sufficiently accurate to diagnose a concussion (e.g., no structural damage on standard neuroimaging). A person does not need to lose consciousness to have sustained a concussion.

How Do Concussions Happen?

A concussion can be caused by a blow to the head, face, or neck, or a blow to the body that transmits a sudden force to the head that causes the brain to move rapidly within the skull. Common causes of concussions include falls, motor vehicle collisions, contact/collision sports, and assaults/forceful shaking.

Concussions in Infants and Young Children

The highest incidence of concussions across age groups occurs in children below the age of 6, with the greatest proportion of these injuries occurring at home. Almost all young children will bump their heads, especially when they are learning to roll over, crawl, walk, and jump. While most of these bumps do not result in concussions, some do result in injury to the brain. Infants and toddlers are particularly vulnerable to concussions because their heads are disproportionately larger and heavier than their bodies, their neck muscles are not as well-developed, and they cannot control their movements as well. There is also rapid growth and development of the brain during infancy and early childhood, making the brain vulnerable to harm.

Signs and Symptoms

A concussion can be especially hard to diagnose in infants, toddlers, and preschoolers because they cannot easily communicate their symptoms. Symptoms may occur right after the incident, or they may appear hours or even days later.

Signs of concussion in all age groups:

- headache
- dizziness, balance problems
- nausea, vomiting
- double or blurry vision
- sensitivity to light and/or noise
- feeling dazed, stunned, or mentally foggy
- trouble concentrating or easily distracted
- trouble remembering
- changes in mood (e.g., irritability, sadness, nervousness)
- drowsiness
- change in sleep patterns (e.g., sleeping more or less, difficulty sleeping)

Possible signs of concussion in young children:

- bump on the head
- persistent rubbing of head
- crying when the head is moved
- increased fussiness
- loss of balance, poor coordination
- loss of interest in playing with favourite toys or doing favourite activities
- other behaviour changes (e.g., more sleepy, more quiet, blank staring)
- refusing to breastfeed or eat
- loss of recently learned skills (e.g., toilet training, speech)

Children who are showing signs of a concussion should receive medical attention. If any of the following symptoms are present or develop, seek medical attention immediately.

For More Information

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Red flag symptoms requiring immediate medical attention include the following:

- loss of consciousness for more than 30 seconds
- persistent vomiting
- blood or fluid from the ear(s)
- seizures
- unexplained swelling on the head
- severe or worsening headache
- unequal pupil size
- increased drowsiness or difficulty waking
- increased restlessness, agitation
- inability to be consoled

Concussion Treatment

The primary treatment for concussion is rest from mental and physical activity. It is important to encourage quiet time, naps, and early bedtimes to allow the brain to heal, particularly in the first 24 to 48 hours after injury. Rest also helps to prevent another head injury or concussion, which can result in worse symptoms, a longer recovery, and more serious damage to the brain.

After the initial period of rest, children can gradually become more active, as long as the activity does not bring on new symptoms or worsen their symptoms. If children experience worsening symptoms, it is a sign that they have not yet recovered enough to tolerate that level of activity. The length of time needed for recovery will depend on the extent of injury to the brain. In children, symptoms are considered persistent if they last longer than four weeks after the injury. In these cases, further medical assessment should take place.

Concussion Outcomes

Although the symptoms and effects of a concussion resolve during the first few weeks following injury in most cases, they can persist for months and sometimes years in some children. The most common post-concussive symptoms include:

- headaches, dizziness
- poor concentration or memory
- mood changes (more emotional, irritable)
- fatigue, difficulty falling asleep

It is important to know that it can take longer for children (and adolescents) to heal after a concussion compared to adults, meaning that their symptoms can last longer.

Although not yet conclusive, there is some preliminary research to suggest that potential long-term outcomes following concussions in toddler and preschool aged children may include:

- effects on cognitive and academic skills
- issues with socio-emotional development (social interactions and social competence)

The types of long-lasting effects seen may be due to the severity of the injury, as well as the age at which the concussion occurred (i.e., functions and abilities that were developing at the time of the injury may be most at risk of disruption).

Potential Impacts on Child-Caregiver Relationships

Preliminary research has also shown that concussions may negatively impact child-caregiver relationships. Traumatic injuries such as concussion can be stressful for caregivers, particularly if they do not

understand that the observed behaviours/symptoms are due to the concussion. More education and support for caregivers may help to reduce caregiver stress and improve outcomes for children.

Preventing Concussions in Young Children

Concussions in this age group are often related to safety hazards in their environment. Because little can be done to change the behaviour of young children, these hazards must be identified and managed by caregivers. While not all concussions can be prevented, many can be avoided by observing the following tips.

- Active adult supervision, meaning attention to what the child is doing and, age-dependent, physical closeness to the child.
- Prevention of falls, including not leaving children unattended on high surfaces; not leaving infant seats on counters; using safety equipment (straps, safety gates, wall anchors for furniture, window guards, etc.); and removing fall hazards.
- Use of properly fitted/installed car seats.
- Educate caregivers about the risks of abusive head trauma, and teach them how to deal with crying infants.
- Encourage the use of appropriate and properly fitted helmets for any riding activities or contact sports, and ensure that children are participating in age-appropriate sports activities.

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