Concussions in children explained

What is a concussion?

A concussion is a functional brain injury, meaning that brain activity and communication can be temporarily disrupted even when there is no visible structural injury on a standard scan. It may follow a direct impact to the head, a forceful hit to the body, or a sudden acceleration-deceleration event such as a fall, collision, or whiplash-like movement. Concussions can occur during sports, play, road incidents, falls at home, or other everyday accidents.

The term mild traumatic brain injury describes the usual severity category, not the importance of the symptoms. A concussion can be medically significant even if the child remains awake, speaks normally, or appears well initially. Loss of consciousness occurs in only a minority of cases and is not required for diagnosis. Likewise, a normal computed tomography scan does not rule out concussion; CT is primarily used when clinicians suspect bleeding, skull fracture, or another structural emergency.

Children are not simply small adults. Their brains and communication abilities are still developing, and younger children may show behavioral or functional changes rather than clearly reporting headache or dizziness. Prior concussion, migraine tendency, learning difficulties, attention disorders, mood disorders,

sleep problems, and other factors may influence recovery and should be discussed during assessment.

Symptoms caregivers may notice

Concussion symptoms can involve several neurologic and physiologic domains. They may begin immediately or emerge later, and a child may have only one or two symptoms. Common physical symptoms include headache or pressure in the head, dizziness, imbalance, nausea, vomiting, sensitivity to light or noise, blurred or double vision, fatigue, and reduced tolerance for physical exertion. Headaches and migraines in children can have many causes, so a new or unusual headache following injury deserves medical advice rather than automatic reassurance.

Cognitive symptoms may include slowed processing, difficulty concentrating, forgetfulness, reduced mental stamina, confusion, or trouble learning new material. A child may seem to need more time to answer questions or may make errors on tasks that were previously easy. Emotional and behavioral changes can include irritability, sadness, anxiety, emotional lability, impulsiveness, or unusual withdrawal. Sleep may increase or decrease, and some children have difficulty falling asleep or wake repeatedly.

In infants and toddlers, clues may be less specific. Caregivers might notice persistent crying, unusual clinginess, refusal to eat or drink, reduced interest in play, unsteady walking, increased irritability, altered sleep, or behavior that is clearly different from usual. These signs do not prove a concussion, but they warrant careful observation and professional guidance, particularly when the mechanism of injury was substantial.

Symptoms are not a reliable measure of how serious the initial impact was. A child who feels better for a short period may still need restrictions, and symptom recurrence during reading, screens, exercise, or schoolwork can indicate that the pace of activity should be reviewed with a clinician.

Emergency warning signs after a head injury

Most concussions do not cause dangerous bleeding, but an intracranial hemorrhage or other serious injury can initially resemble a concussion. Seek

emergency care immediately if a child becomes difficult to wake, increasingly confused, unusually drowsy, or less responsive; has a seizure; develops weakness, numbness, slurred speech, unequal pupils, or a new problem walking; or has repeated vomiting.

Urgent evaluation is also needed for a severe or progressively worsening headache, loss of consciousness, significant neck pain, fluid or blood from the nose or ears, bruising behind the ears or around the eyes without a direct facial injury, marked agitation, or behavior that is substantially abnormal. A child taking anticoagulant medication, with a known bleeding disorder, or with a suspected skull or neck injury requires particularly cautious assessment.

Until help is obtained, keep the child supervised and prevent further impact. If a neck or spinal injury is possible, avoid unnecessary movement. Do not allow the child to return to sports, climbing, cycling, or rough play while symptoms are present or before a healthcare professional has provided appropriate guidance. Emergency services should be contacted when the child’s condition is rapidly deteriorating or safe transport cannot be arranged.

How clinicians evaluate a possible concussion

Assessment begins with the history of the event: what struck the child, the direction and force of movement, whether there was loss of consciousness or amnesia, and what symptoms developed afterward. Clinicians also ask about previous concussions, medications, medical conditions, baseline learning and behavior, sleep, migraine history, and the child’s usual school and athletic demands.

The examination may include level of alertness, speech, memory, attention, eye movements, pupil responses, coordination, balance, gait, strength, sensation, and cervical-spine assessment. In school-aged children and adolescents, standardized symptom inventories or neurocognitive tools may support evaluation, but they do not replace clinical judgment. For younger children, caregiver observations and comparison with baseline behavior are especially valuable.

Neuroimaging is not routinely required for an uncomplicated concussion. A clinician may recommend CT or another investigation when the history and

examination suggest a higher risk of bleeding, fracture, significant deterioration, or another diagnosis. Imaging decisions balance the need to identify serious injury against radiation exposure and the limitations of scans for detecting the functional changes typical of concussion.

Medical review is appropriate even when symptoms seem mild, particularly if the diagnosis is uncertain, symptoms worsen, the child has risk factors, or the injury occurred during organized sport. Follow-up allows the clinician to reassess recovery and identify complications or alternative explanations for persistent symptoms.

Early care and the recovery process

After evaluation, the usual approach is relative rest: reduce activities that clearly aggravate symptoms while maintaining gentle, tolerable daily movement and ordinary self-care. Prolonged isolation in a dark room or complete inactivity is generally not helpful for recovery. Quiet activities, regular hydration and meals, and a consistent sleep schedule can support well-being. Caregivers should follow the treating clinician’s individualized advice, including guidance about pain relief or other medicines, rather than starting or changing medication without consultation.

During the first day or two, a child may need more breaks, less screen exposure, reduced noise, and avoidance of strenuous exercise. Symptoms should guide pacing, but the goal is usually gradual re-engagement rather than waiting for perfect symptom elimination before every activity. Mild, brief symptom increases may be acceptable in some rehabilitation plans; a substantial or sustained increase means the plan may need to be slowed and reviewed.

Recovery time varies. Many children improve over days to a few weeks, while some have symptoms that persist longer. Factors associated with a more prolonged course can include a high initial symptom burden, migraine or vestibular features, previous concussion, sleep disruption, and psychosocial stressors. Persistent dizziness, visual difficulty, exertional intolerance, headaches, sleep problems, or concentration difficulties should prompt follow-up. Depending on the pattern, care may involve pediatric, neurologic, sports-medicine, vestibular, vision, psychology, or school-based professionals.

Returning to school and learning

School attendance does not always need to wait until every symptom has disappeared. Many children benefit from an early, gradual return with temporary accommodations. Examples include shortened days, additional rest breaks, reduced homework, delayed tests, access to a quiet area, printed rather than screen-based work, reduced reading or multitasking, and flexibility around physical education. The exact plan should reflect symptoms and academic demands, and it should be communicated among the family, clinician, and school.

Teachers may notice slower work, difficulty copying from a board, sensitivity to classroom noise or light, or reduced tolerance for busy environments. These changes are useful clinical information, not evidence that a child is being uncooperative. A written plan can specify which activities trigger symptoms, how breaks will be offered, and when accommodations will be reassessed. Academic pressure, inadequate sleep, and missed meals can all make recovery more difficult.

If symptoms interfere significantly with attendance or learning, the healthcare team may recommend a more formal educational support process. Children should be supported emotionally as well as academically; frustration and worry are common when ordinary tasks suddenly require much more effort.

Returning to sports and physical activity

A child should not return to contact, collision, or high-fall-risk sport on the day of injury. Once evaluated and medically cleared to begin progression, return to sport is typically stepwise. The child first performs ordinary activities without significant symptom worsening, then progresses through light aerobic activity, sport-specific movement, noncontact training, more demanding practice, and finally competition. Each stage is usually separated by at least a day, and progression should pause if symptoms recur.

This process is not a race. A child must be able to tolerate school and increasingly strenuous activity before full competition, and a responsible adult should monitor each stage. Returning before recovery is complete increases the risk of another injury and may complicate recovery. Protective equipment can reduce some injury risks but cannot prevent every concussion and

should never be used as permission to play while symptomatic.

Families can also review sports safety for children, including rule enforcement, coach education, appropriate supervision, safe playing environments, and an emergency action plan. Young athletes should be encouraged to report symptoms without fear of losing playing time. Coaches and caregivers should remove a child from play when a concussion is suspected and arrange medical assessment.

Supporting a child and preventing another injury

Children often recover more comfortably when adults provide calm explanations and predictable routines. Tell the child that symptoms are real, recovery is expected, and asking for a break is appropriate. Keep a simple record of headaches, dizziness, sleep, school tolerance, and activity triggers for appointments, while avoiding repeated testing or pressure to prove that the child feels better.

Prevention focuses on reducing exposure and improving safety rather than eliminating all risk. Use properly fitted helmets for activities in which helmets are recommended, follow age-appropriate rules, secure play areas, use seat belts and suitable child restraints, and address hazards such as poor lighting or slippery surfaces. Helmets help prevent skull injury and some other trauma but do not make concussion impossible.

Families should seek reassessment when symptoms are not steadily improving, interfere with school or relationships, or return with increased activity. A child with repeated concussions needs individualized medical advice about risk, recovery, and participation. Caregivers should also recognize that anxiety, low mood, and sleep disruption can accompany prolonged symptoms and deserve attention rather than blame.