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Concussions and Head Injuries

Brain injuries are caused by a bump or blow to the head. These injuries are sometimes called “concussions” or “traumatic brain injuries” and can range from mild to severe.

Most mild brain injuries cause no harm. But sometimes even mild brain injuries can cause serious problems. Head injuries are among the most serious types of injuries that occur among athletes. Careful attention to any head injury by parents, coaches, and medical professionals can help prevent complications from developing.

Skull fractures are uncommon and are unrelated to brain damage or concussion. Brain damage from head injuries is uncommon in sports.

After any significant head injury, the athlete should NOT be left alone and for the first 24 hours should be awakened every 2-3 hours during sleep to be checked.

Statistics

- 20% of the 1.5 million head injuries that occur in the United States each year are sports-related.
- Approximately one tenth of sports-related injuries require hospitalization.
- 20% of high school football players and 40% of college football players will sustain a head injury
- Those who have had a head injury are at 2 to 4 times greater risk of having another.
- Sports most likely to result in concussion: boxing, field hockey, football, ice hockey, lacrosse, martial arts, rodeo, soccer, and wrestling.

Definitions

Concussion refers to a head injury in which there is bruising of the brain, but not permanent damage or bleeding. It may occur with or without loss of consciousness.

Common symptoms include:

- Vacant stare (befuddled facial expression)
- Delayed verbal and motor responses (slow to answer questions or follow instructions)
- Confusion and inability to focus attention (easily distracted and unable to follow through with normal activities)
- Disorientation (walking in the wrong direction; unaware of time, date and place)
- Slurred or incoherent speech (making disjointed or incomprehensible statements)
- Gross observable incoordination (stumbling, inability to walk tandem/straight line)

- Emotions out of proportion to circumstances (distraught, crying for no apparent reason)
- Memory deficits (exhibited by the athlete repeatedly asking the same question that has already been answered, or inability to memorize and recall 3 of 3 words or 3 of 3 objects in 5 minutes)
- Any period of loss of consciousness (paralytic coma, unresponsiveness to arousal)

Sideline Evaluation

Orientation

- Time, place, person, and situation (circumstances of injury).

Concentration

- Digits backward (i.e., 3-1-7, 4-6-8-2, 5-3-0-7-4). Most high school athletes should be able to repeat about 7 numbers forward and five numbers backward, two out of three times.
- Months of the year in reverse order.

Memory

- Details of the contest (plays, moves, strategies, score, period or quarter that injury occurred in, sequence of events that preceded the injury)
- What he/she did prior to game
- Time, date, home address and phone number
- Names of teams in prior contest
- Recall of 3 words and 3 objects at 0 and 5 minutes
- Recent newsworthy events
- Ask child to memorize and minutes later to recall three to five words (immediate recall memory)

Exertional Provocative Tests

- 40 yard sprint
- 5 push-ups
- 5 sit-ups
- 5 knee-bends

Neurological Tests

- Strength
- Coordination and Agility
- Sensation

Any appearance of associated symptoms is abnormal, e.g., headaches, dizziness, nausea, unsteadiness, photophobia, blurred or double vision, emotional lability or mental status changes.

Management of Concussion in Sports

Grades of Concussion

Grade 1	Grade 2	Grade 3
Transient confusion (inattention, inability to maintain a coherent stream of thought and carry out goal-directed movements)	Transient confusion	Any loss of consciousness . Brief (seconds) . Prolonged (minutes)
No loss of consciousness	No loss of consciousness	
Concussion symptoms or mental status abnormalities on examination resolve in less than 15 minutes	Concussion symptoms or mental status abnormalities (including amnesia) on exam lasting more than 15 minutes	

Management Recommendations

Grade 1	Grade 2	Grade 3
Remove from contest	Remove from contest and disallow return that day.	Transport the athlete from the field to the nearest emergency department by ambulance if still unconscious or if worrisome signs are detected (with the cervical spine immobilized)
Examine immediately and at 5-minute intervals for the development of mental status abnormalities or post-concussive symptoms while at rest and then with exertion	Examine on-site frequently for signs of evolving intracranial pathology	A thorough neurologic evaluation should be performed emergently, including appropriate neuroimaging procedures when indicated
May return to contest if mental status abnormalities or post-concussive symptoms clear within 15 minutes.	A trained person should reexamine the athlete the following day.	Hospital admission is indicated if any signs of pathology are detected, or if the mental status of the athlete remains abnormal
A physician should perform a neurologic exam to clear the athlete for return to play after one full asymptomatic week at rest and with exertion.		

When To Return To Play

Grade of Concussion	Return to Play Only After Being Asymptomatic
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	With Normal Neurologic Assessment at Rest And With Exerise
Grade 1 Concussion	15 minutes or less
Multiple Grade 1 Concussions	1 week
Grade 2 Concussion	1 week
Multiple Grade 2 Concussions	2 weeks
Grade 3 – Brief loss of consciousness (seconds)	1 week
Grade 3 – Prolonged loss of consciousness (minutes)	2 weeks
Multiple Grade 3 Concussions	1 month or longer, based on evaluating doctor

What To Watch For After A Head Injury

Normal signs in the first 2 days include:

- Fatigue and desire for extra sleep (but can be easily awakened during sleep)
- Headache (should be fairly mild and not worsening)
- Nausea and vomiting (occasional - not persistent)
- Problems with thinking, concentration, and attention span (this may persist for up to a year or more)

Signs that suggest the need for immediate medical attention include:

- Marked change in personality--often with confusion and irritability
- Worsening headache, especially if associated with nausea or vomiting
- Numbness, tingling, or weakness in the arms or legs, changes in breathing pattern, or seizure
- Eye and vision changes (double vision, blurred vision, unequal-sized pupils)

Preventing Serious Head Injuries

- Understand grades of concussions and follow "return to play" guidelines above.
- A player with symptoms should never be permitted to return to play!
- Insist on the best possible equipment (especially properly fitted head gear) and WEAR IT!
- Always follow safe sports techniques and avoid risks - no head-down tackling (spearing); no diving into water of unknown depth; use care during gymnastic routines; avoid use of trampolines; and wear a helmet for all biking and street skating.
- Always wear a helmet and make sure your child wears a helmet when:
 - Riding a bike, motorcycle, snowmobile, or all terrain vehicle
 - Playing a contact sport, such as football, ice hockey, or boxing
 - Using in-line skates or riding a skateboard
 - Batting and running bases in baseball or softball
 - Riding a horse, Skiing or snowboarding
- Follow-up with your pediatrician after ANY head injury.

American Academy of Pediatrics, Section on Sports Medicine and Fitness

This information should not be used as substitute for the medical care and advice of your child's physician. Health related topics found on the Andorra Pediatrics web site should not be used for diagnosing purposes or be substituted for medical advice. As with any new or ongoing treatment, always consult your professional healthcare provider before making any changes in treatment or beginning any new treatment. If you have any questions or concerns, please call our office.