



Concussion in Sports

This palm card provides information and tools to help medical staff with the on-field recognition and management of concussion.

Concussion Signs and Symptoms¹

Signs Observed by Medical Staff

Appears dazed or stunned
Is confused about assignment
Forgets sports plays
Is unsure of game, score, opponent
Moves clumsily
Answers questions slowly
Loses consciousness (even briefly)
Shows behavior or personality changes
Can't recall events prior to hit or fall
(*retrograde amnesia*)
Can't recall events after hit or fall
(*anterograde amnesia*)

Symptoms Reported by Athlete

Headache or "pressure" in head
Nausea
Balance problems or dizziness
Double or fuzzy vision
Sensitivity to light
Sensitivity to noise
Feeling sluggish or slowed down
Feeling foggy or groggy
Does not "feel right"

This palm card is part of the "Heads Up: Brain Injury in Your Practice" tool kit developed by the Centers for Disease Control and Prevention (CDC). For more information, visit: www.cdc.gov/injury.

Signs of Deteriorating Neurological Function

An athlete should be taken to the emergency department if any of the following signs and/or symptoms are present:

- Headaches that worsen
- Seizures
- Focal neurologic signs
- Looks very drowsy or can't be awakened
- Repeated vomiting
- Slurred speech
- Can't recognize people or places
- Increasing confusion or irritability
- Weakness or numbness in arms or legs
- Neck pain
- Unusual behavior change
- Significant irritability
- Any loss of consciousness greater than 30 seconds or longer.
(*Brief loss of consciousness (under 30 seconds) should be taken seriously and the patient should be carefully monitored.*)

On-Field Mental Status Evaluation

(This mental status assessment is recommended for high school-age athletes and older. Any inability of the athlete to respond correctly to the questions below should be considered abnormal.)

Orientation What period/quarter/half are we in? What stadium/field is this? What city is this? Who is the opposing team? Who scored last? What team did we play last?
Anterograde Amnesia Ask the athlete to repeat the following words: <i>Girl, Dog, Green</i>
Retrograde Amnesia Ask the athlete the following: Do you remember the hit? What happened in the play prior to the hit? What happened in the quarter/period prior to the hit? What was the score of the game prior to the hit?
Concentration Ask the athlete to do the following: Repeat the days of the week backwards (starting with today) Repeat the months of the year backward (starting with December) Repeat these numbers backward 63 (36), 419 (914), 6294 (4926)
Word List Memory Ask the athlete to repeat the three words from earlier: <i>Girl, Dog, Green</i>

No Return to Play

Any athlete who exhibits signs and symptoms of concussion should be removed from play and should not participate in games or practices until they have been evaluated and given permission by an appropriate health care provider. Research indicates that high school athletes with less than 15 minutes of on-field symptoms exhibited deficits on formal neuropsychological testing and re-emergence of active symptoms, lasting up to one week post-injury.²

Exertion

Symptoms will typically worsen or re-emerge with exertion, indicating incomplete recovery. If the athlete is symptom-free, provoking with exertion is recommended (e.g. 5 push-ups, 5 sit ups, 5 knee bends, 40 yard sprint).

Return to play should occur gradually. Individuals should be monitored by an appropriate health care provider for symptoms and cognitive function carefully during each stage of increased exertion.

Repeated Evaluation

On-field, follow-up evaluation (e.g. every 5 minutes) is important, as signs and symptoms of concussion may evolve over time.

Off-Field Management

The physician should provide information to parents/caregivers regarding the athlete's condition. For example, the athlete:

- Should not operate a motor vehicle or participate in activities such as sports, PE class, riding a bicycle, riding carnival rides, etc.
- May experience cognitive/behavioral difficulties at home, making it necessary to reduce physical and cognitive exertion (e.g., running, lifting weights, intensive studying) until fully recovered.
- Should receive follow-up medical and neuropsychological evaluation, both for managing injury and determining return to sports.

¹Adapted from: Lovell MR, Collins MW, Iverson GL, Johnston KM, Bradley JP. Grade 1 or "ding" concussions in high school athletes. *The American Journal of Sports Medicine* 2004;32(1):47-54.

²Lovell MR, Collins MW, Bradley J. Return to play following sports-related concussion. *Clinics in Sports Medicine* 2004;23(3):421-41.