

Management of Concussion in Sports

Grades of Concussion

Grade 1:

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

Grade 2:

1. Transient confusion
2. No loss of consciousness
3. Concussion symptoms or mental status abnormalities (including amnesia) on examination last more than 15 minutes

Grade 3:

1. Any loss of consciousness
 - a) Brief (seconds)
 - b) Prolonged (minutes)

Management Recommendations

Grade 1:

1. Remove from contest
2. Examine immediately and at 5-minute intervals for the development of mental status abnormalities or post-concussive symptoms at rest and with exertion
3. May return to contest if mental status abnormalities or post-concussive symptoms clear within 15 minutes

Grade 2:

1. Remove from contest and disallow return that day
2. Examine on-site frequently for signs of evolving intracranial pathology
3. A trained person should reexamine the athlete the following day
4. A physician should perform a neurologic examination to clear the athlete for return to play after 1 full asymptomatic week at rest and with exertion

Grade 3:

1. Transport the athlete from the field to the nearest emergency department by ambulance if still unconscious or if worrisome signs are detected (with cervical spine immobilization, if indicated)
2. A thorough neurologic evaluation should be performed emergently, including appropriate neuroimaging procedures when indicated
3. Hospital admission is indicated if any signs of pathology are detected, or if the mental status of the athlete remains abnormal

When to Return to Play

Grade of Concussion:	Return to Play Only After Being Asymptomatic with Normal Neurologic Assessment at Rest and with Exercise:
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 decision of evaluating physician

Features of Concussion Frequently Observed

1. Vacant stare (befuddled facial expression)
2. Delayed verbal and motor responses (slow to answer questions or follow instructions)
3. Confusion and inability to focus attention (easily distracted and unable to follow through with normal activities)
4. Disorientation (walking in the wrong direction; unaware of time, date and place)
5. Slurred or incoherent speech (making disjointed or incomprehensible statements)
6. Gross observable incoordination (stumbling, inability to walk tandem/straight line)
7. Emotions out of proportion to circumstances (distracted, crying for no apparent reason)
8. 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)
9. Any period of loss of consciousness (paralytic coma, unresponsiveness to arousal)

Sideline Evaluation

Mental Status Testing

- 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). Months of the year in reverse order.
- Memory:** Names of teams in prior contest. Recall of 3 words and 3 objects at 0 and 5 minutes. Recent newsworthy events. Details of the contest (plays, moves, strategies, etc.)

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.

For more information about the Management of Concussion in Sports Public Education Campaign, please call the Brain Injury Association at (703) 236-6000 ext. 122. To order more pamphlets call (800) 211-2027.