

Concussion Management

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Fact Sheet

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Diagnosis of Concussion

Concussion is defined by the American Academy of Neurology as a “trauma-induced alteration in mental status that may or may not involve loss of consciousness”.¹ Loss of consciousness occurs in less than 10% of cases.^{2,3} Because concussion is a functional, rather than a structural injury, approximately 95% of concussed patients have normal CT scans,⁴ and 70% have normal MRI’s.⁵ In the absence of loss of consciousness or abnormal imaging, the diagnosis of concussion is made on the basis of neurocognitive impairment and presence of symptoms.

Signs and Symptoms of a Concussion

Immediate signs/symptoms may include any of the following: ^{6,7}	Ongoing signs/symptoms may include: ⁸
<ul style="list-style-type: none">• Vacant stare• Delayed verbal expression (slower to answer/follow instructions)• Inability to focus attention (distractable)• Disorientation (walking in wrong direction, unaware of time/day/place)• Slurred or incoherent speech• Gross observable incoordination (stumbling, unable to tandem walk)• Emotional lability• Memory deficits• Any period of loss of consciousness• Nausea/vomiting• Headache• Dizziness	<ul style="list-style-type: none">• Cognitive impairment (memory, attention, concentration, reaction time)• Headache(with/without migraine component)• Difficulty with balance• Dizziness• Difficulty focusing or reading• Fatigue• Photo/phono-sensitivity• Fogginess• Feeling slowed down (bradyphrenia)• Mood disruption (irritability, nervousness, depression)• Amnesia (retrograde or anterograde) surrounding the injury• Sleep disturbance (inadequate or excessive)

Management of Concussion

1. The treatment of choice is REST, with limitation of both cognitive and physical exertion until post concussive symptoms have resolved.
2. Protection from additional injury is another key aspect to management of a concussion. There appears to be increased vulnerability for repeat concussion while the brain is healing from a current concussion.⁹
3. Neurocognitive assessment, typically performed by a neuropsychologist and combined with symptom monitoring, is recommended following sports concussion to help delineate presence of a concussion and to help determine recovery from the injury.¹⁰

4. Balance testing is helpful to establish the presence of concussion as well as track recovery.^{11,12}
5. Medication and/or physical therapy may be beneficial in cases where recovery is incomplete after 2-3 weeks. When indicated, medications should be directed toward specific post-concussive symptoms which may include headache/migraine, sleep disturbance, mood dysfunction or cognitive deficits.

Recovery from a Concussion

Current guidelines recommend restriction from activity which may lead to another concussion until full recovery can be demonstrated from the current concussion. While there is no single clinical test to establish full recovery, best current practice models require that patients are symptom-free at rest; have normal neurocognitive and balance testing; and experience no return of abnormalities when full cognitive and physical activity are introduced.^{13,14}

Physical Therapy for Concussion

Following sports concussion, up to 79% of patients report dizziness and 56% of patients experience balance impairment.⁸ Vestibular physical therapists are specially trained in the assessment and treatment of dizziness and balance deficits. Post-concussive dizziness may arise from several sources, including benign paroxysmal positional vertigo (BPPV), post-traumatic migraines, labyrinthine concussion, perilymphatic fistula and brainstem concussion.¹⁵ Vestibular physical therapy has been shown to be effective in managing patients following concussion who continue to experience ongoing imbalance or dizziness without spontaneous resolution.¹⁶ In addition, athletes who sustain a concussion may benefit from structured physical therapy to aide in recovery of strength and conditioning necessary for return to sports activity.¹⁷

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References:

1. Practice parameter: the management of concussion in sports (summary statement). Report of the Quality Standards Subcommittee. *Neurology*. 1997;48:581-585.
2. Guskiewicz KM. Assessment of postural stability following sport-related concussion. *Curr Sports Med Rep*. 2003;2(1):24-30.
3. McCrea M, Guskiewicz KM, Marshall SW, et al. Acute effects and recovery time following concussion in collegiate football players: the NCAA concussion study. *JAMA*. 2003;290(19):2556-2563.
4. Jagoda AS, Cantrill SV, Wears RL, et al. Clinical policy: neuroimaging and decisionmaking in adult mild traumatic brain injury in the acute setting. *Ann Emerg Med*. 2002;40(2):231-249.
5. Hughes DG, Jackson A, Mason DL, Berry E, Hollis S, Yates DW. Abnormalities on magnetic resonance imaging seen acutely following mild traumatic brain injury: correlation with neuropsychological tests and delayed recovery. *Neuroradiology*. 2004;46(7):550-558.
6. Kelly JP, Rosenberg JH. Diagnosis and management of concussion in sports. *Neurology*. 1997;48(3):575-580.
7. McCrory P, Johnston K, Meeuwisse W, et al. Summary and agreement statement of the 2nd International Conference on Concussion in Sport, Prague 2004. *Br J Sports Med*. 2005;39(4):196-204.
8. Lovell MR, Iverson GL, Collins MW, et al. Measurement of symptoms following sports-related concussion: reliability and normative data for the post-concussion scale. *Applied Neuropsychology*. 2006;13(3):166-174.

9. McCrea M, Guskiewicz K, Randolph C, et al. Effects of a symptom-free waiting period on clinical outcome and risk of reinjury after sport-related concussion. *Neurosurgery*. 2009;65 (5):876-882; discussion 882-873.
10. Aubry M, Cantu R, Dvorak J, et al. Summary and agreement statement of the First International Conference on Concussion in Sport, Vienna 2001. Recommendations for the improvement of safety and health of athletes who may suffer concussive injuries. *Br J Sports Med*. 2002;36(1):6-10.
11. Guskiewicz KM. Postural stability assessment following concussion: one piece of the puzzle. *Clin J Sport Med*. 2001;11(3):182-189.
12. Catena RD, van Donkelaar P, Chou LS. Cognitive task effects on gait stability following concussion. *Exp Brain Res*. 2007;176(1):23-31.
13. McCrory P, Meeuwisse W, Johnston K, et al. Consensus statement on concussion in sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. *J Athl Train*. Jul-Aug 2009;44(4):434-448.
14. Lovell M, Collins M, Bradley J. Return to play following sports-related concussion. *Clin Sports Med*. 2004;23(3):421-441, ix.
15. Furman JM, Cass SP, Whitney SL. *Vestibular Disorders : A Case-Study Approach to Diagnosis and Treatment*. 3rd ed. New York, NY: Oxford University Press, Inc; 2010.
16. Alsalaheen B, Mucha A, Morris L, et al. Vestibular rehabilitation for dizziness and balance disorders after concussion. *J Neurol Phys Ther*. 2010;34:87-93.
17. Gagnon I, Galli C, Friedman D, Grilli L, Iverson GL. Active rehabilitation for children who are slow to recover following sport-related concussion. *Brain Inj*. 2009;23(12):956-964.

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