

Concussion: Identification, Management, and Testing

As of the latest consensus statement on concussion in sport (5th International Conference on Concussion in Sport, Berlin, October 2016) concussion is defined as “representing the immediate and transient symptoms of traumatic brain injury”.

Common Features:

- Direct blow to the head, face, neck or elsewhere on the body with an impulsive force transmitted to the head
- Rapid onset of short- lived impairment of neurological function that resolves spontaneously
 - o Symptoms can present immediately to 3 days later
 - o ~80% of concussions resolve in <21 days
- Functional disturbance rather than structural injury. No abnormalities on standard imaging
- No loss of consciousness required

Sideline Evaluation:

- SCAT5 currently represents the most well-established and rigorously developed instrument available for sideline assessment
 - o Pediatric version available for children under 13 years old
 - o Tool to aid healthcare professionals. Not to be used standalone or for diagnosis

Signs and Symptoms:

- Symptoms: somatic (e.g. headache), cognitive (e.g. fogginess), and/ or emotional (e.g. lability)
- Physical (e.g. loss of consciousness, amnesia, poor coordination)
- Balance impairment (e.g. gait unsteadiness)
- Behavioural changes (e.g. irritability)
- Cognitive impairment (e.g. slowed reaction time)
- Sleep/ wake disturbance (e.g. drowsiness)

Removal from Activity

- Immediate evaluation from on-site medical personnel when possible
- “When in doubt sit them out”
 - o All players that are suspected to have a concussion should immediately be removed from play and no player with suspected concussion should return to play without clearance from a [qualified healthcare provider](#)

Re- evaluation:

- Medical assessment: history, detailed neurological exam, cognitive function, sleep/ wake disturbance, ocular function, vestibular function, gait and balance
 - o No currently available imaging, blood test or biomarker that can diagnose a concussion

Rest:

- First 24- 48 hours= complete rest (e.g. no electronics, reading, school, physical activity)
- Next 48 hours plus= relative rest

- Gradually and progressively increase activity while staying below cognitive and physical symptom- exacerbation thresholds (do what you can without making symptoms worse)

Rehabilitation:

- Specific to the individual based on clinical findings (e.g. cervical, vestibular, visual, physiologic)

Recovery:

- Return to full school or work before return to sport
- Return to sport performed in steps that are individualized to players sport
 - Each step takes a minimum of 24 hours (may remain longer at any step)
 - Minimum of 1 week to return to full sport from date of concussion

Baseline Testing:

- **No one specific test has been validated for use as an effective baseline test for concussions**
- **Based on current evidence the use of baseline computerized neuropsychological testing is not recommended in children and adolescents**
- Best practice is a detailed history including: concussion history, previous head, face or cervical spine injuries, and comorbidities (e.g. visual tracking dysfunction, migraines, effectors of balance). Tools to assist (e.g. SCAT5, VOMS)

Prevention:

- Rule changes (e.g. ice hockey body checking age increase)
- Hit training: teaching players how to properly hit and be hit (e.g. helmetless football practices)
- Possibility of vision training and cervical strengthening (more research needed)
- Helmets do not prevent concussions, but do prevent other head injuries
- Mouth guards do not prevent concussions, but do prevent or mitigate dental injuries

Thank you



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5 Quick Tips for Coaches and Parents

Concussions can happen from a direct blow to the head, face, neck or elsewhere on the body with an impulsive force transmitted to the head

No loss of consciousness or specific amount of force is required to sustain a concussion

“When in doubt sit them out”

No player with a suspected concussion can return to play within 24 hours and a medical clearance

Complete rest for 24- 48 hours and then relative rest thereafter. Daily activities as tolerated without exacerbation of symptoms

Baseline testing is not validated or recommended for youth athletes and having a baseline test does not change assessment or treatment if a concussion does occur

Resources

- 5th International Consensus Statement on Concussion in Sport (Berlin October 2016)
 - o <https://bjsm.bmj.com/content/early/2017/04/28/bjsports-2017-097699>
- SCAT5
 - o [https://casem-acmse.org/wp-content/uploads/2018/06/bjsports-2017-097506SCAT5.full1 .pdf](https://casem-acmse.org/wp-content/uploads/2018/06/bjsports-2017-097506SCAT5.full1.pdf)
- Child SCAT5
 - o <https://casem-acmse.org/wp-content/uploads/2018/06/child-scat.pdf>
- 4 Characteristics of a Good Concussion Clinic
 - o <https://casem-acmse.org/wp-content/uploads/2018/06/CCES-PUB-CCC-4Qs-E-FINAL.pdf>
- The top 5 key messages from the 5th International Consensus Statement on Concussion in Sport
 - o https://casem-acmse.org/wp-content/uploads/2018/06/5-key-messages-from-Berlin_ENG-1.pdf
- Concussion Ed: free app with further information for parents
 - o <http://www.parachutecanada.org/concussion/whattodo>
- Judo Canada
 - o <http://www.judocanada.org/concussion-documents/>
- Parachute baseline testing information
 - o <http://www.parachutecanada.org/downloads/injurytopics/BaselineTestingStatement-Parachute.pdf>
 - o <http://www.parachutecanada.org/injury-topics/item/statement-on-concussion-baseline-testing-in-canada>