

# Recommendations of the UCI, MC on Concussion

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The UCI, MC accepts the definition and recommendations of the recent "Consensus Statement on Concussion in Sport 3rd International Conference on Concussion in Sport Held in Zurich, November 2008" (1.). The former mentioned paper is recognised as a revision and update of the recommendations developed following the 1<sup>st</sup> (Vienna, 2003) and 2<sup>nd</sup> (Prague, 2005) International Symposia on Concussion in Sport (2,3). What is written here is a form of introduction to the reference 1., which accompanies this executive summary and should be read and followed in detail by anyone supervising head injuries in cycling.

## Definition of Concussion

***Concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include:***

- 1. Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an "impulsive" force transmitted to the head.***
- 2. Concussion typically results in the rapid onset of short-lived impairment of neurologic function that resolves spontaneously.***
- 3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury.***
- 4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course; however, it is important to note that, in a small percentage of cases, post-concussive symptoms may be prolonged.***
- 5. No abnormality on standard structural neuroimaging studies is seen in concussion.***

## Preamble

In general, the two big issues in concussion are first of all recognising that the injury has occurred and, secondly, when to allow a player back to play. In cycling this has major implications for stage road events and mountain biking. The sporting community accept the recent consensus on concussion and we now wish to see it applied to cycling.

The youth athlete is particularly susceptible to brain injury and a special session of the conference (1.) was devoted to the unique case of injury to athletes less than 15 years of age. Because the developing brain can take longer to recover from an injury, the physician needs to be especially vigilant about releasing a previously concussed young athlete back to sport.

## **Post-concussion syndrome**

The importance of follow up of a concussion for days to months is necessary. Post-concussion syndrome is also known as postconcussive syndrome (PCS). Historically it was called “shell shock”. It is a set of symptoms that a person may experience for weeks, months, or occasionally up to a year or more after a concussion.

A concussion is a mild form of traumatic brain injury (TBI). PCS may also occur in moderate and severe cases of traumatic brain injury. Symptoms of PCS, which is the most common entity to be diagnosed in people who have suffered TBI, may occur in 38–80% of mild head injuries. A diagnosis may be made when symptoms resulting from concussion last for more than three months after the injury. It may be made starting within a week or ten days of trauma. In late, persistent, or prolonged PCS (PPCS), symptoms last for three to over six months.

The condition can cause a variety of symptoms: physical, (headache), cognitive, (difficulty concentrating) and emotional and behavioral, (irritability). As many of the symptoms in PCS are common to, or exacerbated by, other disorders, there is a risk of misdiagnosis. Though there is no treatment for PCS itself, symptoms can be treated; medications and physical and behavioral therapy may be used, and patients can be educated about symptoms and their usual prognosis. The majority of PCS disappear after a period of time.

## **Assessment of concussion**

### **Symptoms and Signs of Acute Concussion**

The panel (1.) agreed that the diagnosis of acute concussion usually involves the assessment of a range of domains including clinical symptoms, physical signs, behavior, balance, sleep and cognition. Furthermore, a detailed concussion history is an important part of the evaluation both in the injured athlete and when conducting a pre-participation examination. The detailed clinical assessment of concussion is outlined in the SCAT2 form below, (Table A.).

### **On-field or Sideline Evaluation of Acute Concussion**

When a player shows ANY features of a concussion:

- (a) The player should be medically evaluated onsite using standard emergency management principles, and particular attention should be given to excluding a cervical spine injury.
- (b) The appropriate disposition of the player must be determined by the treating healthcare provider in a timely manner. If no healthcare provider is available, the player should be safely removed from practice or play and urgent referral to a physician arranged.
- (c) Once the first aid issues are addressed, then an assessment of the concussive injury should be made using the SCAT2 or other similar tool.

(d) The player should not be left alone following the injury, and serial monitoring for deterioration is essential over the initial few hours following injury.

(e) A player with diagnosed concussion should not be allowed to return to play on the day of injury. Occasionally, in adult athletes, there may be return to play on the same day as the injury.

### **Management of concussion**

Details of all suggestions on how to manage a concussion are outlined in reference 1. Some of the recommendations are as follows:

The cornerstone of concussion management is physical and cognitive rest until symptoms resolve and then a graded program of exertion prior to medical clearance and return to play. The recovery and outcome of this injury may be modified by a number of factors that may require more sophisticated management strategies. These are outlined in the reference 1.

The majority of injuries will recover spontaneously over several days. In these situations, it is expected that an athlete will proceed progressively through a stepwise return to play strategy. During this period of recovery, while symptomatically following an injury, it is important to emphasize to the athlete that physical AND cognitive rest is required. Activities that require concentration and attention (eg, scholastic work, videogames, text messaging,) may exacerbate symptoms and possibly delay recovery. In such cases, apart from limiting relevant physical and cognitive activities (and other risk-taking opportunities for re-injury), while symptomatic, no further intervention is required during the period of recovery, and the athlete typically resumes sport without further problem.

Return to play (RTP) protocol following a concussion follows a stepwise process as outlined in Table B. With this stepwise progression, the athlete should continue to proceed to the next level if asymptomatic at the current level. Generally, each step should take 24 hours so that an athlete would take approximately one week to proceed through the full rehabilitation protocol once they are asymptomatic at rest and with provocative exercise. If any post-concussion symptoms occur while in the stepwise program, then the patient should drop back to the previous asymptomatic level and try to progress again after a further 24-hour period of rest has passed.

In the overall management of moderate to severe traumatic brain injury, duration of LOC is an acknowledged predictor of outcome. Whilst published findings in concussion describe LOC associated with specific early cognitive deficits, it has not been noted as a measure of injury severity. Consensus discussion determined that prolonged (>1 minute duration) LOC would be considered as a factor that may modify management.

With adult athletes, in some settings, where there are team physicians experienced in concussion management and sufficient resources (eg, access to neuropsychologists, consultants, neuroimaging,), as well as access to immediate (ie, sideline) neuro-cognitive assessment, return to play management may be more rapid. The RTP strategy must still follow the same basic management principles, namely, full clinical and cognitive recovery before consideration of return to play.

**Table A. Clinical assessment of concussion is outlined in the SCAT2**

**Table B. Stepwise approach to return to play**

**REFERENCES:**

1. McCrory, Paul MBBS, PhD; Meeuwisse, Willem MD, PhD; Johnston, Karen MD, PhD; Dvorak, Jiri MD; Aubry, Mark MD; Molloy, Mick MB; Cantu, Robert MA, MD. Consensus Statement on Concussion in Sport, 3rd International Conference on Concussion in Sport, Held in Zurich, November 2008: *Clinical Journal of Sport Medicine*: May 2009 - Volume 19 - Issue 3 - pp 185-200
2. 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;36:6-10.
3. 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;39:196-204.