

# HEAD INJURY AND CONCUSSION

## **Guidelines for the Management of Concussion in the Context of Equestrian Sports**

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(2007)

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(2012)

### Introduction:

Head injuries are common in all forms of equestrian sport, and it is often a problem for the doctor present at the scene of injury or sporting event to decide on the degree of injury, whether the competitor should continue to participate, whether a period of suspension from competition is needed, or whether the competitor should be referred to hospital for further assessment.

Numerous guidelines have been published on the diagnosis and management of head injuries but none is available which is specifically aimed at assisting the doctor at equestrian events.

The following brief guidance is based on existing good practise as outlined in:

- NICE Guidelines on Head Injury 2007
- Consensus Statement of the 3<sup>rd</sup> International Conference on Concussion in Sport 2008
- British Horse Racing Authority (BHA) Medical Standards and Guidance on Concussion 2010
- International Rugby Board (IRB) Concussion Guidelines 2011
- British Eventing (BE) Doctor's Pack 2012

### Definition:

Concussion is very difficult to define, especially in the early stages such as when a rider has just fallen. The standard definition of a "transient alteration in brain function" is not very helpful as in the immediate phase we do not know if it is going to be transient.

There are numerous proposed concussion grading scales but evidence of correlation with ultimate injury severity is limited. Similarly, the Glasgow Coma Score, so widely used in UK and recommended by NICE as the gold standard for assessment, is good at detecting significant brain injury, but not so good at picking up the patient with concussion at an early stage. However, several "side line" tools for the assessment of concussion in sport have been published and are commonly used in sports like rugby football and professional as well as amateur horse racing.

For the purposes of the medical officer at an equestrian event, faced with someone who has had a head injury, the following points should be borne in mind:

1. Concussion can result from a direct blow to the head, or from indirect forces.
2. Concussion is not always associated with loss of consciousness.
3. Concussion results in symptoms such as headache, nausea, feeling dazed, although these may not be immediate.
4. Concussion causes signs of cognitive dysfunction, such as amnesia, confusion, disorientation, inability to do simple tasks. These can sometimes be picked up before the rider is symptomatic.
5. Questions asked must be relevant and should be fairly recent as short term memory is often most impaired.

### Diagnosis and Management:

**1.)** A structured approach to the assessment is suggested if the rider has any of the following:

- Reduced level of consciousness on Glasgow Coma Score (<15) which does not return to normal within 10 minutes.
- Altered pupillary reaction, or grossly unequal (20% of population have some inequality)
- Any neurological deficit
- Any signs of skull fracture (penetrating head injury, otorrhoea, rhinorrhoea, bleeding from ears or nose in absence of direct trauma, black eyes in absence of direct trauma especially bilateral, Battles' sign (bruising over mastoid), visible or palpable skull depression, full thickness scalp laceration, boggy haematoma)
- Has had a fit at any stage since injury. Try to differentiate between the single "twitch on the pitch" (which occurs immediately after injury, resolves quickly and spontaneously and leaves no post-ictal signs or symptoms) and the true fit, which can occur at any time, is longer, often associated with incontinence and leaves the patient feeling woozy over a delayed period after consciousness is regained.

They should be transferred to hospital by "999" ambulance. Appropriate airway and cervical spine management should be instigated. Notes of the medical assessment including the time should be sent with the injured rider.

**2.)** If the rider has none of the above but may have lost consciousness (sometimes difficult to answer, but a period of immobility after the fall in association with a suggestive mechanism makes this very likely; if necessary ascertain from witnesses to the accident) then:

- The rider is unfit to continue and should be suspended for a period of time according to the particular regulations of the governing organisation.
- They should have a further medical assessment for ongoing signs of concussion (modified Pocket SCAT2 +/- SAC).
- The rider should be advised to get checked over in the nearest Emergency Department. They can be transported by a responsible parent or carer, but should not drive themselves.
- They should be given appropriate advice about self-care and graduated return to sport/exercise (IRB Concussion Guidelines) and it should be emphasised that they must be completely symptom free before riding again.

The medical officer should record this advice and note who the carer is. The rider/carers should also be given a copy of the medical assessment or patient report form to take with them.

**3.)** Assess the fallen rider for the presence of post-traumatic amnesia. This can be retrograde, i.e. for events that have occurred prior to the fall and /or anterograde, i.e. for events occurring after the fall. Ongoing anterograde amnesia is more concerning than retrograde amnesia, as this suggests difficulty in forming new memory rather than just loss of previously formed short-term memory.

- In order to test for retrograde post-traumatic amnesia, use a “fence-side” assessment like the Turner Questions (horse racing), the Pocket SCAT2 or other appropriate questions for the sport, such as for eventing:
  - What is your horse's name?
  - Which venue/ competition is this?
  - Which class are you competing in?
  - How did you get on in previous parts of the competition?
  - Which fence number are you at? (approximately)
- In order to test for anterograde post-traumatic amnesia use concentration and memory forming tests such as the SAC (Sideline Assessment for Concussion).

A “fence side” head injury assessment form is included at the end of this guidance document. A modified Romberg’s test or other tests may detect subtle motor abnormalities but there is little evidence as to their significance apart from demonstrating some objective dysfunction (which can be useful sometimes in persuading the rider to listen to advice). Persistent headache and nausea at rest, or on exercise, preclude riding until fully recovered.

Unfortunately the definition of “significant” amnesia varies in the different guidelines. In general if there is ANY amnesia, disorientation (in time, place or person) or confusion at the time of the examination, then the rider should not continue and should be reassessed at 15-30 minutes after the fall/injury. At this stage, any rider with ongoing anterograde amnesia or with retrograde amnesia for events that have occurred more than 15 minutes prior to the fall should be advised to get checked over in the nearest Emergency Department.

Rules on rider suspension are also variable:

- British Eventing regulations stipulate that any symptoms of > 15 minutes duration mandate 21 days suspension, whereas riders with symptoms lasting for <15 minutes should be suspended for 7 days.
- The BHA mandate that professional as well as point-to-point jockeys have to undergo computer and paper-based neurological testing prior to being signed off for return to race riding.

**4.)** If the rider was up immediately after the fall (giving perhaps a slight allowance for being “winded”) AND has absolutely no symptoms or signs at the time of the initial examination, AND has no external signs of head injury then they may continue with advice to seek reassessment if they become symptomatic at a later stage. This is particularly important as deterioration after a period of apparent normality is associated with significant intracranial pathology, particularly the extradural haemorrhage.

If, however, such a rider had a witnessed fall on the head or any other high-risk mechanism of injury then they should be re-assessed by the medical officer at 15-30 minutes after the fall/injury. Should at this stage they remain completely normal with GCS 15, full orientation, no amnesia, no signs of confusion or cognitive dysfunction, no headache, no nausea, and no other neurological signs, then they can ride subsequently and no suspension is required.

**5.)** All riders with a suspected injury to the head (with or without signs of concussion) should receive adequate head injury advice in the form of a written leaflet which are provided both by BE and the BHA as well as at the end of the guidance document.

### Cervical Spine Immobilisation:

Riders who have sustained head injury may have co-incidental cervical spine injury. It is worth mentioning the assessment for and management of suspected cervical spine injury as this is a very difficult area for the doctor in the field. The mechanism of injury in any fall from a horse can produce sufficient force to put the cervical spine at risk. Standard clinical decision rules (NEXUS and Canadian C-spine Rules) were designed for use in a hospital-based setting, i.e. in Emergency Departments and cannot necessarily be extrapolated to the pre-hospital arena. However, a combination of both has proven useful in performing a clinical risk assessment for when to immobilise the cervical spine.

According to this, the rider's cervical spine should be immobilised if any of the following is present:

- High-risk mechanism of injury, i.e. suspected or witnessed hyperflexion, hyperextension or axial loading of the cervical spine
- History of loss of consciousness or currently altered level of consciousness
- Rider age >65 years and/or known pre-existing degenerative or rheumatologic conditions of the cervical spine, i.e. cervical spondylosis or ankylosing spondylitis
- Midline bony tenderness over the cervical spine
- Focal neurological changes to upper or lower limbs, i.e. paraesthesia or motor weakness
- Pain or paraesthesia on active movement of the neck
- Presence of any other significant or distracting injuries, i.e. limb fractures, torso injuries, etc.
- Potential masking of pain by prior opioid analgesia or any other strong pain killers

Remember these scary statistics:

- 20% of cervical spine injuries worsen after they get to hospital, many more en route.
- 15% of patients with a spinal injury will have a second fracture at a different level.



## HEAD INJURY ADVICE FOR RIDERS

Event:

Date:

..... has sustained a head injury. After examination, the doctor considers that

- Check up in hospital is advised.
- You may go home, but should take things easy for 24 – 48 hours.

When you get home it is unlikely that you will have further problems. Head Injury assessment immediately after the injury is occasionally normal while the injury is developing. It is unlikely that you will have further problems, but if any of the following symptoms do occur we suggest you get someone to take you to your nearest hospital Emergency (A&E) Department as soon as possible:

- unconsciousness, or lack of full consciousness (for example, problems keeping eyes open)
- confusion (not knowing where you are, getting things muddled up)
- drowsiness (feeling sleepy) that goes on for longer than 1 hour when you would normally be wide awake, or greater than usual difficulty waking up
- any problems understanding or speaking
- any loss of balance or problems walking
- any weakness in one or more arms or legs
- any problems with your eyesight
- very painful headache that won't go away, despite simple painkillers such as paracetamol or ibuprofen
- vomiting or persistent severe nausea
- any fits (collapsing or passing out suddenly)
- clear fluid coming out of your ear or nose
- new bleeding from one or both ears
- new deafness in one or both ears.

If you follow this advice you should get better more quickly and it may help any symptoms you have to go away.

- DO NOT stay at home alone for the first 48 hours after the injury
- DO make sure you stay within easy reach of a telephone and medical help

- DO have plenty of rest and avoid stressful situations
- DO NOT take any alcohol or drugs for 24 hours or while symptoms persist
- DO NOT take sleeping pills, sedatives or tranquilisers unless they are given by a doctor
- DO NOT play any contact sport (for example, rugby or football) for at least 3 weeks without talking to your doctor first
- DO NOT return to your normal school, college or work activity until you feel you have completely recovered
- DO NOT ride, drive a car or motorbike, cycle, or operate machinery until you feel you have completely recovered.

There are symptoms which may occur over the next few days which you shouldn't worry about

- mild dizziness or light headed feeling
- irritability or bad temper
- problems concentrating or problems with your memory
- tiredness, lack of appetite or problems sleeping.

If you feel very concerned about any of these symptoms in the first few days after the injury, you should go and see your own doctor to talk about them. These problems will usually resolve within 2 weeks or so of the injury. If they do not go away after 2 weeks, you should go and see your doctor. You are strongly advised not to ride while you have symptoms.

If you have been knocked out, or had any symptoms that lasted for more than 15 minutes after the injury, then you are likely to be subject to suspension from competition for a period of up to 21 days. You may need to be assessed by a doctor before competing again. The event medical officer can advise, but if you have any doubts or questions you should check with the ruling body for your sport.

### Long-term problems

Most patients recover quickly from their accident and experience no long-term problems. However, some patients only develop problems after a few weeks. If you start to feel that things are not quite right (for example, memory problems, not feeling yourself), then please contact your doctor so that he/she can make sure you are recovering properly.