CONCUSSION MANAGEMENT PROTOCOL
2011-2012

A **CONCUSSION** is a disturbance in the functioning of the brain caused by direct trauma to the head, face or neck; or following a blow elsewhere on the body that transmits an "impulsive force" to the head. This results in the rapid onset of a short-lived impairment of neurologic function that resolves spontaneously. There **may** or **may not** be a **loss of consciousness (LOC)**; but frequently there is **retrograde** amnesia (difficulty recalling events immediately prior to the injury), and/or **anterograde** amnesia (difficulty recalling events which occur following the concussive injury). Athletes suffering from a concussion can display a wide variety of signs and symptoms, some of which can be very subtle. Resolution of clinical and cognitive symptoms typically occurs gradually, over a 7-10 day period. However, some athletes may also have a more prolonged recovery. There is currently no way to predict this in advance. It is also common that further (new) concussive injuries can cause the same or worse symptoms, with increasingly less force – especially if the athlete returns to training/competition before the brain is fully recovered. **CONCUSSION HAS THE POTENTIAL TO BE A CAREER ENDING INJURY** and for this reason we are taking extra precaution on the return to snow protocol and your health.

POST CONCUSSIVE SYMPTOMS
Post concussive symptoms can be physical, cognitive and emotional.

Physical or "somatic" symptoms – include headache, nausea, and dizziness, ringing in the ears, double vision or other visual disturbances.
Cognitive symptoms – include confusion, amnesia, disorientation, poor concentration, memory disturbance.
Emotional symptoms – include depression, moodiness.

There can also be problems with coordination and balance (vestibular function).

PRE-SEASON ASSESSMENT

All athletes shall undergo a **pre-season medical and physiotherapy examination**, which will include **baseline oculo-vestibular screening** (balance testing), a **SCAT2** test **(Standardized Concussion Assessment Tool)**[1] and neurocognitive testing with the computer-based **ImPACT test (Immediate Post-concussion Assessment and Cognitive Tool)**[2]. This test is done on-line (instructions will or have been sent out to all athletes) – and requires a land connection to the Internet, and an external mouse (as it also includes measures of reaction time). A baseline test should be repeated at least once per year. In athletes less than 18 years of age, a baseline test should be conducted every 6 months.

The ImPACT test includes demographic information and a detailed concussion history, which contains questions about previous head injuries, loss of consciousness, and amnesia, as well as time "off" from training or snowboarding due to concussion. There are also very specific questions about cognitive, physical and emotional symptoms.

It is important to identify athletes who are not fully recovered from previous concussions, as they are more vulnerable for recurrent injury, persistent post-concussive symptoms, cumulative neurological problems, and potentially even injuries that are life-threatening.

In addition to the above screening, neuropsychology screening will be introduced for athletes in disciplines at higher risk for concussion (SBX and Freestyle). This will include an assessment by a neuropsychologist at a team camp at the beginning of the year. Follow up neuropsychology evaluation will only occur after an athlete has experienced a concussion and symptoms are not subsiding within 7-10 days.

ACUTE INJURY MANAGEMENT FOR CONCUSSION

A physiotherapist and/or a team physician will be on-site during all training and competition. Should a crash or head injury occur, the injured athlete will be evaluated as soon as possible, in cooperation with local medical and paramedical staff. Full cervical spine precautions and management must be used, due to possible cervical spine injury.

Where a team physician is not present, the physiotherapist will evaluate any athlete suspected of having a concussive injury at training or competition venues, and then bring that athlete to the attention of one of the physicians at the venue if possible. The Medical Lead should be notified of the injury at the first available opportunity. He/she may also be contacted as necessary, for further instructions about ongoing management.

Any athlete who is thought to have suffered a concussive injury (even if the incident is not witnessed) will be withdrawn from that race or training session, and shall undergo a formal medical evaluation as soon as possible. Any athlete complaining of headache, nausea, change in vision, ringing in the ears, confusion, or dizziness; or displaying poor coordination, poor balance, difficulty answering questions or easy distractibility should be immediately brought to the attention of the physician and physiotherapist.

It is critical that any athlete suspected of having a concussion not be left alone! He/she should be carefully monitored for any signs or symptoms of deterioration in the immediate post-injury period.

In the event of a ***structural brain injury,*** signs and symptoms may include: increasingly severe headaches, decreasing level of consciousness, increasing tiredness and confusion, lateralizing (to one side) weakness, or persistent vomiting. Any one of these symptoms requires emergency assessment. Neuro-imaging (CT or MRI) may be indicated. In such cases, if these tests are performed, it is **important** to obtain copies of the **reports** as well as a CD with the **images** on it, to bring back to Canada with the athlete.

POST INJURY MANAGEMENT

The cornerstone of concussion management is **rest**, until complete resolution of all symptoms. This includes both **physical** and **cognitive** or **mental rest**. Athletes should therefore remain in a quiet environment, and avoid excessive exposure to stimulation such as television, computer, video games or text messaging. Meditation has been shown to help in recovery from concussion.

Athletes should avoid alcohol and medication use after concussion. Some mild analgesics (pain-killers) and anti-inflammatories may be prescribed, but it should be recognized that these have the potential to mask some of the signs and symptoms of concussion.

RETURN TO SNOWBOARDING PROTOCOL

The return to snowboarding progression is begun once the athlete has been off all medications and completely symptom-free for a minimum of 24 hours.

We will be using the **return to play guidelines** from the Summary and Agreement Statement of the **Third International Symposium on Concussion in Sport-Zurich 2009**.[2] This is a step-wise process, each step being separated by a minimum of 24 hours. Progression to the next step only occurs if the athlete is completely asymptomatic at the current level. With any recurrence of even one of the concussive symptoms, the athlete should drop back to the previous asymptomatic level.

Steps in the return to play protocol include:

1. Complete physical and cognitive (mental) rest until asymptomatic
2. Low intensity aerobic exercise (walking, spinning on a stationary bike) but no resistance training (weight-training)
3. Higher intensity aerobic exercise
4. Easy free snowboarding and can start light resistance training
5. After medical clearance - can first start more strenuous training on snow
6. Explosive movements and heavy resistance training should be introduced gradually, and their execution and effects must be at pre-injury levels at the minimum (Consideration must be taken with regard to previous deficits in any of the physical areas, because they might have contributed to the injury occurring).
7. After medical clearance, physiotherapy and strength and conditioning assessment – can return to full training for competition
8. After full competence is shown in riding skills, reaction skills, recovery, general health and fitness excellence (as assessed by the entire IST, including the Medical

Lead, Head Physiotherapist, Strength and Conditioning coach and/or Sport Psychologist, clearance by the HP Director, and finally by the athlete's Head Coach), the athlete may return to full competition.

Note: With this protocol, it will take a minimum of one week following complete resolution of symptoms before an athlete is able to return to his/her full activities.

Assessment and follow-up "on the road" can be done by the physiotherapist, using the **SCAT2** and the vestibular screening protocol. Repeat neurocognitive testing (ImPACT) will only be performed once the athlete is completely symptom free after step 4 and the athlete will require medical clearance before moving onto step 5.

Most athletes with concussion will typically easily progress through these steps over 7-10 days. An athlete with a more severe concussion (an injury where the athlete suffers persistent symptoms, specific sequelae, or prolonged cognitive impairment, or an athlete who has suffered multiple concussions) may require a prolonged period of asymptomatic rest (Step 1) as well as more time at each of the subsequent steps in the progression. In this case, follow up neuropsychology testing will take place.

If the athlete has returned home, and has to remain away from training and competition for some time, he/she should be followed on a regular basis by an IST member who will be designated as the "**Case Manager**". This could be the team physiotherapist or Medical Lead, but this person should be clearly identified, and should keep other IST members and the coach up-to-date on the athlete's progress, treatment and recovery. This process can be facilitated through the Canada~Snowboard office.

Other therapies that can be done at the same time include rehabilitation of any cervical (neck) symptoms, as well as visual and vestibular (balance) exercises. Any athlete with persistent "somatic" symptoms after two weeks should be thoroughly re-evaluated. This may involve referral to a clinical neuropsychologist for more in-depth testing, and/or to a specialist in concussion (neurologist or neurosurgeon) for further management guidelines.

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