National Alpine Committee Concussion Policy

The National Alpine Committee (NAC) Concussion Policy is based on current international consensus opinion 1-3. The welfare of all winter sport athletes in Australia depends on concussion being recognised and correctly managed by a medical doctor. These policy guidelines should be adhered to at all times.

What is concussion:

Concussion is a disturbance in the brain’s ability to acquire and process information. The reduced function of the brain represents damage to nerve cells (neurons). The neurons can be damaged by a direct blow to the head, which cause the brain to rotate and/or move forward and backward. Indirect impact to the body can transfer an impulsive force to the brain which damages neurons.
The effect that this has on the athlete can vary from person to person, depending on which part of the brain is affected. The impact can cause concussion signs visible to those who witnessed the collision.

Concussion should be suspected if these signs are observed:

- Unresponsiveness
- Upper limb muscle rigidity
- Upper limb spontaneous movement
- A fit / seizure soon after contacting the surface
- Balance difficulty
- Slow responses
- Vacant stare
- Confusion
- Disorientation
- Holding the head
- Facial injury
- Speech slurring
Minutes to hours after the impact injury the athlete may complain of 4:

- Headache
- Nausea / Vomiting
- Blurred vision
- Memory loss / difficulty
- Dizziness
- Tiredness
- Not feeling right
- Sensitive to bright light & loud noise

Days to weeks after the impact the athlete could have/feel 4:

- Sleep difficulty
- Persistent low grade headache
- Poor attention & concentration
- Sad or irritable or frustrated
- Tired easily
- Lethargic, low motivation
- Slow reaction time

Take Home Message

An athlete does not have to lose consciousness to have a concussion.

How common is concussion in snow sports:

Head injuries constitute 16-27% of injuries in children & adolescents participating in snow sports. 5,6 The incidence of concussion among snowboarding and skiing participants is high. The incidence in snowboarders has been reported as 100 per 1000 snowboarder-exposures. 7 Concussions account for 62 - 66 % of head injuries in winter
adolescents (13-18 yrs) have higher concussion rates than children (< 12 years). 

Why worry about it:

It is recognised that most concussions get better in 7 to 10 days. However, ignoring concussion signs and symptoms or not recognising them, can result in potential catastrophic consequences. Acute brain swelling, traditionally referred to as “Second Impact Syndrome” is usually fatal. Prolonged symptoms, recurrent concussion, learning difficulties, personality problems have also been reported.

What should parents, coaches and support staff do before the season:

Prepare for the sports season by studying up on concussion. Have the resources with you that allow easy recognition of possible concussion. Have easy access to a check list of the warning signs of structural brain injury. Know where the closest emergency department or medical
practice is in relation to your current location. It is highly recommended that **baseline computerised brain function** testing is completed preseason for the following reasons:

- Easily accessible and cost effective.
- Detects when impaired brain function lasts longer than the athlete has symptoms. ²
- Provides precise measures of reaction time are provided for repeated testing over time. ²
- Provides extra information in athletes with previous concussions. ²
- Helps to find those athletes with delayed brain function recovery who need more detailed testing with a neuropsychologist. ²
- Is a useful add-on to clinical assessment and judgement. ²
- Of medicolegal benefit to show that all available resources were used in a concussion case.
- The test is easy to administer and takes a short time. ²
- Athletes can under report their symptoms to keep playing. ¹⁰
- Younger athletes may not recognise symptoms of concussion. ¹⁰
- Athletes may be overly anxious. ¹⁰
- Need added assurance for aggressive return to play decisions in professional sport. ¹⁰

**What should parents, coaches and other staff do at the event:**

Ensure the correct use of helmet head protection. Identify suspected concussion. Any athlete with suspected concussion must be withdrawn from the event or training immediately. Furthermore, no athlete with
concussion should be return to the same event or practice that day. ALL athletes with concussion or suspected of concussion need an urgent medical assessment. In the days or weeks following concussion, an athlete should not be allowed to return to events or train until they have had medical clearance from a medical doctor.

**Take Home Message**

Any athlete with suspected concussion should be removed from the event and not return to sport or training that day.

All athletes with suspected concussion should see a medical doctor as soon as possible.

**How to manage the unconscious athlete:**

Basic first aid principles apply. Protect the athlete’s neck and secure an open airway. Urgent hospital referral is necessary for any athlete who has lost consciousness as a result of a blow to the head or body. Indications for urgent referral to hospital include:

- Fractured skull
- Penetrating skull trauma
- Loss of consciousness
- Deterioration in conscious state following injury
- Increasing confusion
- Worsening headache post injury
- Persistent vomiting
- Any convulsive movements
- Focal neurological signs
- More than one episode of concussive injury in a match or training session
- All children with head injuries
- High-risk patients (e.g., hemophilia, anticoagulant use)
- High-risk injury mechanism (eg high velocity impact, missile injury)
- Inadequate post injury supervision

See a medical doctor as soon as possible:
A concussed athlete should see a medical doctor with experience in managing concussion. The medical doctor should see the athlete on a number of occasions, performing serial assessments. At the first visit, the doctor will do a full neurological examination and document current symptoms. It is recommended that balance testing and computerised neuropsychological testing document the recovery process. Recovery from concussion may take longer in younger players (under 18), therefore a conservative approach to playing sport again should be followed.

Rehabilitation of concussion in snow sports:
Initial balance and visual training can start within days of the concussion. Balance training and reaction times drills are fundamental to skiers safely returning to the slopes. It is believed poor balance is implicated in concussion in the first place.
How does the athlete get back to snow sport:
Athletes should only return to activity when symptoms have gone away and cognitive function has returned to normal. Once the athlete feels well, exercise can follow on from vision and balance training. Progression of exercise challenge can occur every 24 hours. If athletes start to feel unwell during or after exercise, they should rest for 24 hours and then attempt the same exercise challenge. Only when an athlete has completed all the stages of exercise challenge can they obtain written medical clearance from a medical doctor. The athlete should give this medical clearance to their coach. It is the coaches responsibility to forward the medical clearance to NAC. Always start a comeback from concussion with low speed, low risk ski training drills under supervision.

NAC Concussion Action Plan

- Recognise
- Remove from play
- Find a doctor
- Medical assessments
- Brain function testing
- Rehabilitation
- Final medical clearance
Available resources for parents and coaches:

Sports Concussion Australasia™
Axon Sports
Sports Concussion South Africa

Concussion Tools

FirstResponder™
References


(8) Graves JM, Whitehill JM, Stream JO, Vavilala MS, Rivara FP. Emergency department-reported head injuries from skiing and
