



POLICY OBJECTIVE

This aim of this policy is to provide guidelines for Snowsports New Zealand (SSNZ) staff involved in managing athletes who have sustained a sport-related concussion.

Our common goal is to achieve a successful return to sport, with full recovery and readiness to perform in competition, in the quickest time frame possible. This policy places high priority on minimisation of short term risks and long term health consequences, to ensure athlete health and wellbeing and continue elite performance.

This policy provides standardised guidelines to assist SSNZ medical, physiotherapy and coaching staff during training camps and competition. Our protocol is consistent with the principles outlined in the documents

- Consensus statement on concussion in sport—the 5th international conference on concussion in sport held in Berlin, October 2016 (British Journal of Sports Medicine, 2017)
- FIS Medical Guide, 2013
- ACC Sportsmart Sport Concussion in New Zealand National Guidelines

This policy can be used for snow sports athletes at all participation levels and ages (recreational, elite, sub elite).

This policy will continue to be updated in accordance with new research and consensus statements. Please check the Snowsports NZ website for the most up to date version.

POLICY STATEMENT/ WHO THE POLICY APPLIES TO

This policy applies to all SSNZ contracted athletes, coaches and support staff (employees and contractors) and other persons selected to a SSNZ team.

POLICY PRINCIPLES

- Concussion must be taken seriously to safeguard the long-term welfare of athletes
- Athletes with concussion must be removed from participation and may not resume on the same day
- Athletes suspected of concussion must be thoroughly assessed and monitored by a healthcare professional
- Athletes with concussion must progress through a Graded Return to Sport (GRTS) protocol (outlined in this document)
- Athletes must receive medical clearance before returning to sport

WHAT IS A CONCUSSION

Concussion can be caused by a direct blow to the head, face, neck or impact to elsewhere in the body with impulsive force transmission to the head. This force may result in a rapid onset of short-lived impairment of brain function, that resolves spontaneously. Symptoms are often evident immediately, but may appear over minutes to hours. Loss of consciousness (LOC) may or may not occur.

Concussions occur frequently in snow sport disciplines. Transient neurological disturbances are usually seen, followed by spontaneous recovery, in 80-90% of cases within 7-10 days.

However, each concussion is different and the length of time to full recovery can vary between individuals, and also on different occasions in the same individual. It may take days, weeks or even months to make a full return to sport and the recovery time cannot reliably be predicted.

BEWARE OF STRUCTURAL INJURY REQUIRING **URGENT** CARE

Forces to the head can produce structural damage including scalp and facial lacerations, fractures, cervical spine injury and intracranial haemorrhage. An extradural haemorrhage (brain bleed) may initially be **indistinguishable** from concussion, but the athlete may deteriorate dramatically at any time in the first 4 hours. The safest place for such a deterioration to occur is in a hospital Emergency Room. If you have any doubts concerning structural head or neck injury, urgent evacuation of the athlete to a quality medical facility is recommended.

Symptoms requiring Emergency Room URGENT care are, but not limited to

- A headache that worsens
- An athlete that is very drowsy or can't be awakened (woken up)
- Have repeated vomiting
- Have seizures (arm or legs jerk uncontrollably)
- Are unsteady on feet, or have slurred speech
- Have weak or numb arms or legs
- Can't recognise people or places

CONCUSSION MANAGEMENT GUIDELINES

STEP 1- READY

Protective gear:

For prevention or reduction in severity of concussion, we encourage the use of:

- Helmets: The International Ski Federation (FIS) rules state that the National Ski Associations require their athletes to use helmets which conform to recognised and appropriate standards including CEN 1077 or ASTM F2040
- It is mandatory for an athlete to replace their helmet if they have experienced a concussive episode or any damage has occurred to their helmet through normal use or travel
- Custom moulded mouthguards (for prevention of fractures and dental injury)

Baseline testing:

- It is recommended athletes complete a baseline SCAT 5 or SCAT5 Child and if possible baseline ImPACT test annually.

STEP 2- RECOGNISE

Coaches, athletes, team-mates/ athletes, parents and official in addition to medical personal have an important role in observing possible concussion and effects, and should take responsibility for removing the injured athlete from snow immediately.

Signs and symptoms indicative of a concussion are:

Signs	Symptoms
<ul style="list-style-type: none"> - Headache - Sensitivity to light or sound - Feeling slowed down or in a fog - Sadness - Anger - Un-Coordination & balance impairment - Irritability - Sleepiness/ drowsiness 	<ul style="list-style-type: none"> - Amnesia, slow reaction time - Emotional, tearfulness - Neurological Signs - Groggy, unsteady state - Uncharacteristic aggression - Loss Of Consciousness

STEP 3- REMOVE

- The athlete **MUST** be removed from snow and **MUST NOT** resume sport that day if concussion is suspected or diagnosed
- The athlete **MUST** be evaluated by a trained healthcare professional; if unavailable on site, referral is to be arranged.

- The first healthcare priority is to exclude cervical spine or structural brain injury – if there is any doubt, arrange urgent referral.
 - The following signs are strongly indicative of concussion:
 - Traumatic convulsion (seizure)
 - Tonic posturing
 - Confirmed or suspected LOC – sliding like a “rag doll”
 - Ataxia – unsteady on feet, “groggy”
 - Disorientation or confusion

SCAT 5 & VOMS

Perform a SCAT 5 & VOMS test to determine concussion recognition as soon as possible. If it is obvious that the athlete has sustained a concussion then an immediate SCAT 5 may not be necessary.

If you do not have access to a baseline, then the SCAT5 is **positive** if:

- There are one or more symptoms that are not usual for that athlete
- BESS: Tandem - 3 errors or Single Leg stance - 4 errors
- SAC: Total score 24/30 or less, digits backward 2 or less, delayed recall 3 or less

If there is doubt about the diagnosis a ImPACT test could be done, but this is rarely required.

“IF IN DOUBT, SIT THEM OUT”

- If concussion is NOT confirmed then monitor symptoms for 48 hours to allow for delayed onset.
- If no SSNZ/ HPSNZ medical or physiotherapy staff are present: fellow athletes, coaches, team administrators or parents who observe an athlete displaying signs of concussion have a duty of care to ensure the athlete is removed from snow in a safe manner. Referral to a medical practitioner is recommended as soon as possible for comprehensive assessment.
- Any athlete with a suspected concussion should go through a GRTS protocol

STEP 4- RE EVALUATE

- The athlete should not be left alone and monitoring for deterioration is essential for the first 4-6 hours- if you don't have the resources for this then the athlete should be evacuated to a medical facility.
- Professional re-evaluation at 4-6 hours, 24 hours and 36-48 hours post-injury should include
 - Repeat SCAT5
 - Repeat VOMS testing (Neurological, ocular, vestibular, balance and gait assessment)
 - Status – has there been improvement or deterioration?

Notify or call SSNZ coach and Medical Director (Nat Anglem) + Medical Team Leader (Sarah Gillespie) as soon as possible after concussion. It is important to keep us informed of information and developments to facilitate a smooth rehabilitation process. If assessment is completed by a doctor please send admission, discharge or other medical or imaging reports to Sarah Gillespie, or Nat Anglem.

STEP 5- REST & RECOVERY

Physical and mental rest is recommended - This does mean avoid screen time or reading and minimal exercise (e.g. walking to meals, etc)

- The rest period is usually just 24-48 hours, even if acute symptoms have not resolved
- There are no evidence-based guidelines for the optimal duration and type of rest. The benefits of rest may have been overstated in the past
- Gradual progressive increase in physical and cognitive activity below symptom thresholds is encouraged after 24- 48 hours rest

Low-level exercise may benefit athletes whose symptoms are slow to resolve and can commence at 24-48 hours, and exercise that doesn't worsen existing symptoms is encouraged. Athletes do not need to be symptom free to commence light exercise.

Continue to monitor SCAT 5 symptom scale and BESS daily until scores are 0, or return to baseline. The usefulness of a SCAT 5 diminishes 3-5 days post injury.

- If there is any deterioration in symptoms, seek medical assessment immediately
Pain relief and non-steroidal anti-inflammatory (NSAID) medications are not recommended in the first 48 hours postconcussion. There is very little evidence to support the use of pharmacological agents.

Attention should be paid to **sleep hygiene, nutrition and hydration** in the period post-concussion.

When the athlete passes the BESS testing, or can complete low level exercises that doesn't worsen existing symptoms then commence on graded return to performance (GRTP) program below.

STEP 6- REHABILITATION AND RETURN- GRTP PROGRAM

- There are 6 stages of the GRTP
- The quickest possible progression is to move forward by one stage per 24 hours
- If symptoms recur or worsen at any stage, drop back to the previous asymptomatic level and try again 24 hours later
- When an athlete can complete each stage successfully with no setbacks, it takes 7 days to complete the full rehabilitation protocol.

GRTP STAGE 1- LIGHT AEROBIC EXERCISE

15 mins of steady heart rate physical activity, at 60-70% of maximum predicted heart rate

- Suitable forms of cardio exercise include treadmill walking, swimming, stationary cycling, rowing ergometer, elliptical trainer, etc
- Reassess symptoms 10 mins post-exercise using the SCAT5 Symptom Evaluation scale
- The objective of continuous aerobic exercise is adaptation to controlled levels of heart rate and intracranial pressure

Return to Vision & Balance Exercises can also be commenced at this stage

- Separately reassess symptoms 10 mins post-vision and balance exercise, in order to enable attribution of symptoms to either the exercise or the vision and balance program.

GRTP STAGE 2- MODERATE AEROBIC EXERCISE

30 mins steady heart rate activity: 15 minutes at 60-70% maximum predicted HR + 15 minutes at 70-85% maximum predicted HR

- The cold winter environment is an additional stressor, physiologically and cognitively. Outdoor activity such as walking, running or cycling can be incorporated for GRTP Stage 2

GRTP STAGE 3- SNOWSPORTS SPECIFIC FUNCTIONAL ACTIVITIES

A dry land battery of sport-specific tasks includes activities such as rolling, jumping, landings, hopping.

These can be modified to best replicate the demands of each discipline. Some useful suggestions include:

- 10 x jumps forwards (continuous)
- 10 x jumps backwards
- 10 x hops forward each leg- hands on hips
- 10 x hops backwards each leg- hands on hips
- 10 x skater jumps each leg – arms away from hips
- 10 x vertical jumps (countermovement jump)
- 10 x double leg landings (from 50cm height)
- 10 x drop squats
- 5 x single leg landings each leg
- 4 x landing drills with 90 deg turn to each side
- Balance drills – eyes open and closed
- Handstands
- 2 x Forward Rolls
- 2 x 360s (one left, one right)

This interval type training work leads to variable higher levels of intracranial pressure, as well as challenging coordination, balance and cognitive function
Communicate with SSNZ staff for medical clearance before return to snow the following day (for adults).

GRTP STAGE 4- NON CONTACT, LOW IMPACT SPORT SPECIFIC ON SNOW TRAINING (PLAY)

Be sensible and creative in designing a logical progression relevant to the sport and team programming. Normal warm up can be commenced.

Some suggestions include:

- Half pipe - riding flats, dropping in and riding pipe but straight air low amplitudes, 3 hour maximum.
- Slopestyle- rails and jumps in medium line, low amplitude, simple tricks, 3 hour maximum.
- Alpine- on snow drills, freeskiing, skiing gates at 70% max effort, fully clothed, 10 run maximum
- Progressive resistance and cardio training can also be resumed.

GRTP STAGE 5 – FULL -CONTACT, NORMAL ON-SNOW TRAINING (DRILL)

This will include usual practice of jumps, rails, landings, technical manoeuvres, tactical responses and potential for falling.

Resumption of usual resistance training intensity

GRTP STAGE 6 – UNRESTRICTED RETURN TO PERFORMANCE (PUSH)

- The quickest possible progression to Stage 6 is **7 days** from the day of injury.

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The number, severity and duration (particularly if >10 days) of symptoms may warrant GRTP modification including:

- Prolonged LOC (>1 minute)
- Post-traumatic or retrograde amnesia
- Concussive convulsions

THE JUNIOR ATHLETE

Children and adolescents require more conservative management of concussion. Their physiological responses and symptoms differ from those of adults.

- The Child- SCAT5 must be used for athletes aged 5-12

There is increased risk of a catastrophic outcome from premature return to sport in children

- Diffuse cerebral swelling, or “second impact syndrome”, is rare but potentially fatal

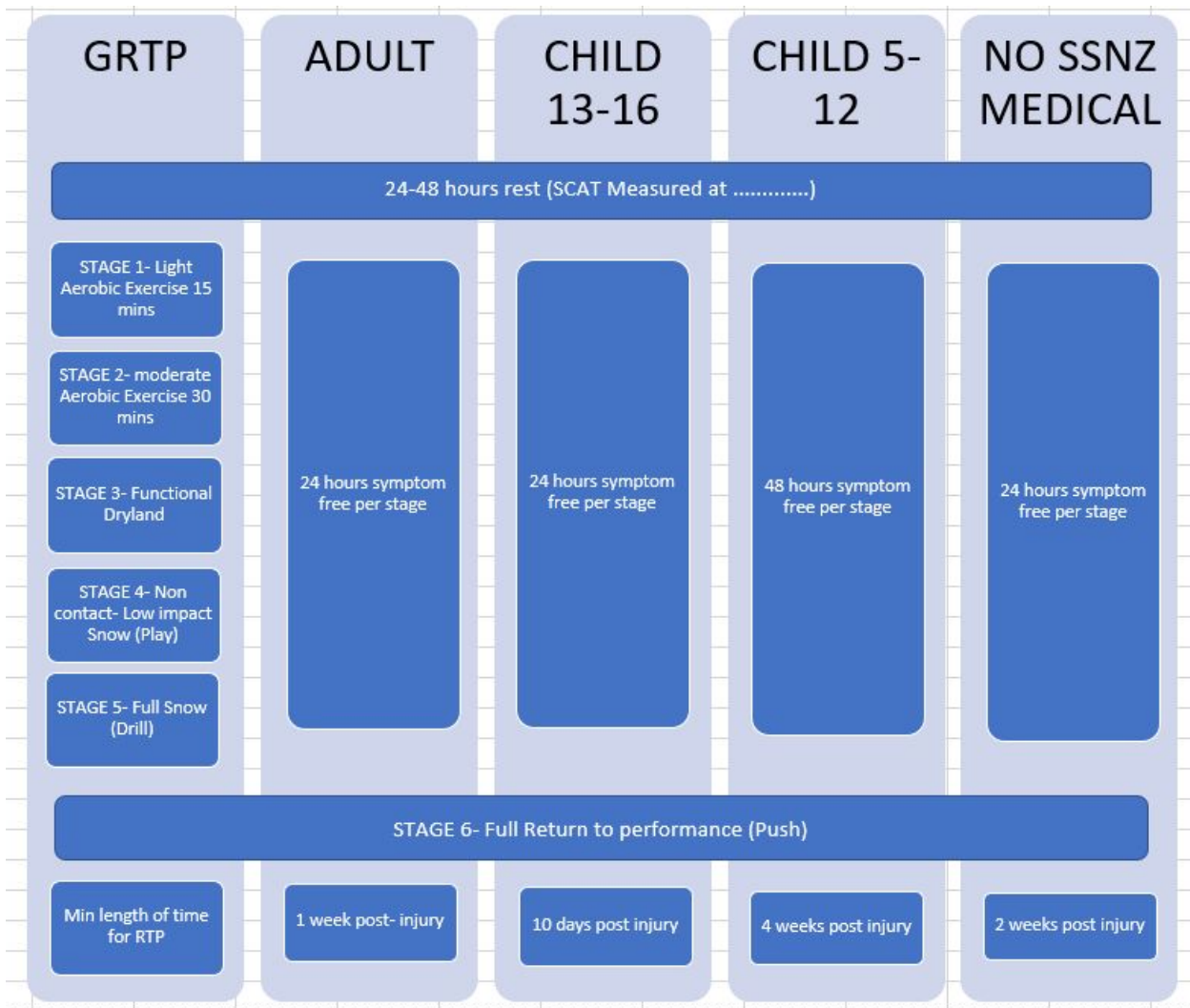
Based on age considerations, modified GRTP protocols are specified

- **Ages 13-17:** a minimum 4 day rest is mandated prior to commencing GRTP Stage 1. This doubles the minimum return to sport time to 2 weeks.
- **Ages 5-12:** a minimum 1-week rest, with 48 hours minimum per GRTP stage. This doubles the minimum return to sport time again, to 4
- The Child-SCAT5 must be used for children aged 5-12

ABSENCE OF SSNZ/ HPSNZ MEDICAL STAFF

In cases of concussion occurring during a training camp or competition unattended by SSNZ/HPSNZ medical staff, the GRTP protocol is modified accordingly

- The prescribed period of symptom-limited physical and mental activity (GRTP Stage 0) is extended to **3 days**. This extends the minimum time for return to sport to 10 days (as opposed to 1 week with medical staff present)



DOCUMENTATION:

Accurate, timely medical record keeping is essential. Please upload all medical or physiotherapy notes, in addition to Symptom responses and post concussive tests to Gensolve. Or Smartabase.

EXPECTATIONS:

Failure to abide by this SSNZ concussion management policy, including failure to disclose possible symptoms of concussion to SSNZ medical/ physiotherapy staff may expose an athlete to danger, unnecessary risk of injury and increased risk of long term health consequences, limiting their opportunity for performance.

It is important that all athletes and supports persons, respect and support the implementations of this policy. If you have questions or reservations towards this policy, please make them known so they can be addressed accordingly.

Failure to comply with the SSNZ concussion policy may expose an athlete and their support personnel to disciplinary action and sanctions as determined by the SSNZ board.