



Ski NB Concussion Management Protocol

WHAT IS A CONCUSSION?

A concussion is a brain injury that can't be seen on x-rays, CT or MRI scans. It affects the way an athlete thinks and can cause a variety of symptoms.

WHAT CAUSES A CONCUSSION?

Any blow to the head, face or neck, or somewhere else on the body that may cause a sudden jarring of the head may cause a concussion.

WHEN SHOULD I SUSPECT A CONCUSSION?

A concussion should be suspected in any athlete who sustains a significant impact to the head, face, neck, or body and reports *one or more* symptoms or demonstrates *one or more* visual signs of a concussion. A concussion should be suspected if an athlete reports ANY concussion symptoms to one of their peers, parents, teachers or coaches, or if anyone witnesses an athlete exhibiting ANY of the visual signs of concussion, even if a concussive event was not witnessed. Some athletes will develop symptoms immediately while others will develop delayed symptoms (beginning up to 24-48hrs after the injury).

RED FLAG Symptoms

If **ANY** of the following signs are observed or complaints are reported after an impact to the head or body, the athlete should be immediately removed and transferred to the closest hospital by ambulance for urgent medical care by a health care professional:

Neck Pain or Tenderness	Weakness or numbness/tingling in more than one arm or leg
Seizures, "fits" or convulsions	Repeated Vomiting
Loss of vision or double vision	Severe or increasing headache
Loss of consciousness	Increasingly restless, agitated or combative
Increased confusion or deteriorating conscious state (becoming less responsive, drowsy)	Visible deformity of the skull

WHAT ARE THE SYMPTOMS OF A CONCUSSION?

Headaches or head pressure	Easily upset or angered
Dizziness	Sadness
Nausea and vomiting	Nervousness or anxiety
Blurred or fuzzy vision	Feeling more emotional

Sensitivity to light or sound	Sleeping more or less than usual
Balance problems	Having a hard time falling asleep
Feeling tired or having no energy	Difficulty working on a computer
Not thinking clearly	Difficulty reading
Feeling slowed down	Difficulty learning new information

WHAT ARE THE VISUAL SIGNS OF A CONCUSSION?

Lying motionless on the playing surface	Blank or vacant stare
Slow to get up after a direct or indirect blow to the head	Balance, gait difficulties, motor incoordination, stumbling, slow labored movements
Disorientation or confusion or inability to respond appropriately to questions	Facial injury after head trauma
	Clutching head

WHAT SHOULD I DO IF I SUSPECT A CONCUSSION?

If any athlete is suspected of sustaining a concussion during training or racing (or any sporting activity) they should be immediately removed from play. Any athlete who is suspected of having sustained a concussion during training or racing must not be allowed to continue skiing until assessed by a medical doctor or nurse practitioner. It is important that ALL athletes with a suspected concussion undergo a medical assessment by a medical doctor or nurse practitioner as soon as possible. Athletes with a suspected concussion **will not be permitted to return to racing or training with SKI NB** until their coaches **receive written medical clearance** (see Medical Assessment for Concussion form) from a medical doctor or nurse practitioner. Initial medical clearance may be obtained from either the race doctor or covering SKI NB medical team if a concussion has been ruled out on the day of injury.

If concussion is ruled out by a medical doctor or nurse practitioner after leaving the hill, that medical professional must provide written medical clearance.

If the athlete is diagnosed with a concussion, a graduated return to school and racing is to be followed under the supervision of their medical provider (see below). When appropriate, the medical doctor or nurse practitioner must complete the Return to Play form, and it must be given to the athlete’s coach before they will be allowed to resume formal training.

WHEN CAN THE ATHLETE RETURN TO SCHOOL AND SPORTS?

It is important that all athletes diagnosed with a concussion follow a step-wise return to school and sports-related activities that includes the following Return to School and Return to Sport Strategies. It is important that youth and adult student athletes return to full-time school activities before progressing to stage 5 and 6 of the Return to Sport Strategy.

Return to School Strategy

Step	Activity	Description	Goal of each step
1	Activities of daily living and relative rest (first 24 to 48 hours)	<ul style="list-style-type: none"> ○ Typical activities at home (e.g. preparing meals, social interactions, light walking) that do not result in more than mild and brief worsening of symptoms ○ Minimize screen time 	Gradual reintroduction of typical activities
After a maximum of 24 to 48 hours after injury, progress to step 2.			

2	School activities with encouragement to return to school (as tolerated)	<ul style="list-style-type: none"> ○ Homework, reading or other light cognitive activities at school or at home ○ Take breaks and adapt activities if they result in more than mild and brief worsening of symptoms ○ Gradually resume screen time, as tolerated 	Increase tolerance to cognitive work and connect socially with peers
If the student can tolerate school activities, progress to step 3.			
3	Part-time or full days at school with accommodations (as needed)	<ul style="list-style-type: none"> ○ Gradually reintroduce schoolwork ○ Build tolerance to the classroom and school environment over time. Part-time school days with access to breaks throughout the day and other accommodations may be required ○ Gradually reduce accommodations related to the concussion and increase workload 	Increase academic activities.
If the student can tolerate full days without accommodations for concussion, progress to step 4.			
4	Return to school full-time	<ul style="list-style-type: none"> ○ Return to full days at school and academic activities, without accommodations related to the concussion ○ For return to sport and physical activity, including physical education class, refer to the Return-to-Sport Strategy 	Return to full academic activities.
Return to school is complete.			

Table adapted from: Patricios, Schneider et al., 2023; Reed, Zemek et al., 2023

Alpine Skiing Sport Specific Return to Sport Strategy

The athlete should spend a minimum of 24 hours at each step before progressing on to the next. It is common for an athlete's symptoms to worsen slightly with activity. This is acceptable as they progress through steps 1 to 3 of return to sport, so long as symptom exacerbation is:

- **mild:** symptoms worsen by only one to two points on a zero-to-10 scale, and
- **brief:** symptoms settle back down to pre-activity levels within an hour.

If the athlete's symptoms worsen more than this, they should stop the activity and try resuming the next day at the same step.

Before progressing to step 4 of the sport-specific Return-to-Sport Strategy, athletes must:

- successfully complete all steps of the Return-to-School Strategy (if applicable), and
- provide their coach with a Medical Clearance Letter indicating they have been medically cleared to return to activities with risk of falling or contact.

If the athlete experiences concussion symptoms after medical clearance (i.e., during steps 4 to 6), they should return to step 3 to establish full resolution of symptoms. Medical clearance will be required again before progressing to step 4.

Step	Activity	Activity details	Goal of each step
1	Activities of daily living and relative rest (first 24 to 48 hours)	<ul style="list-style-type: none"> ○ Typical activities at home (e.g. preparing meals, social interactions, light walking) that do not result in more than mild and brief worsening of symptoms ○ Minimize screen time 	Gradual reintroduction of typical activities.
After a maximum of 24 to 48 hours after injury, progress to step 2.			
2	2A: Light effort aerobic exercise	<ul style="list-style-type: none"> ○ Start with light aerobic exercise, such as stationary cycling and walking at a slow to medium pace ○ May begin light resistance training that does not result in more than mild and brief worsening of symptoms ○ Exercise up to approximately 55% of maximum heart rate ○ Take breaks and modify activities as needed 	Increase heart rate.
	2B: Moderate effort aerobic exercise	<p>Gradually increase tolerance and intensity of aerobic activities, such as stationary cycling and walking at a brisk pace</p> <ul style="list-style-type: none"> ○ Exercise up to approximately 70% of maximum heart rate ○ Take breaks and modify activities as needed 	
If the athlete can tolerate moderate aerobic exercise, progress to step 3.			
3	Individual sport-specific activities, without risk of inadvertent head impact	<ul style="list-style-type: none"> ○ Add sport-specific activities ○ Perform activities individually and under supervision from a teacher, parent/caregiver or coach ○ Progress to where the athlete is free of concussion-related symptoms, even when exercising ○ <i>Moderate intensity jogging for 30-60 minutes at sub-symptom threshold intensity</i> ○ <i>Low intensity free skiing, max 60 minutes on snow time</i> ○ <i>No head impact</i> 	Increase the intensity of aerobic activities and introduce low- risk sport-specific movements
Medical clearance If the athlete has completed return to school (if applicable) and has been medically cleared, progress to step 4.			

4	Non-contact training drills and activities	<ul style="list-style-type: none"> ○ Progress to exercises with no body contact at high intensity, including more challenging drills and activities (e.g., multi-athlete training and practices) ○ <i>May start progressive resistance training</i> ○ <i>Participation in higher intensity running and dryland drills</i> ○ <i>Low-contact on hill training (either independent or with coaches)</i> 	Resume usual intensity of exercise, co-ordination and activity-related cognitive skills.
If the athlete can tolerate usual intensity of activities with no return of symptoms, progress to step 5.			
5	Return to all non-competitive activities, full-contact practice and physical education activities	<ul style="list-style-type: none"> ○ Progress to higher-risk activities including typical training activities, full-contact sport practices and physical education class activities ○ Do not participate in competition ○ <i>Participation in full training without activity restriction</i> 	Return to activities that have a risk of falling or body contact, restore confidence and assess functional skills by coaching staff
If the athlete can tolerate non-competitive, high-risk activities, progress to step 6.			
6	Return to sport	Unrestricted sport and physical activity	
Return to sport is complete.			

Athletes who have been provided with a Medical Clearance Letter may progress through steps 4, 5 and 6 of the Sport-specific Return-to-Sport Strategy to gradually return to full, unrestricted sport activities. If the athlete experiences any new concussion-like symptoms during these steps, they should be instructed to stop the activity and return to step 3 to establish the full resolution of symptoms. Medical clearance is required again before progressing to step 4. This information should be provided to the appropriate people (e.g., coach, trainer, teacher).

HOW LONG WILL IT TAKE AN ATHLETE TO RECOVER?

Most youth athletes (<19) will recover within 1-4 weeks. Adults should recover within 1-2 weeks. Approximately 15-30% of athletes will experience persistent concussion symptoms (>4 weeks for youth and adults) that may require additional medical assessment and management by a clinic specializing in the management of concussion.

It is common for an athlete's symptoms to worsen slightly with activity. This is acceptable as they progress through steps as long as the symptom exacerbation is:

- **Mild:** Symptoms worsen by only 1-2 points on a 10-point scale
- **Brief:** Symptoms settle back down to pre-activity levels within an hour

If the athlete's symptoms worsen more than this, they should pause and adapt activities as needed.

HOW CAN I HELP PREVENT CONCUSSIONS AND THEIR CONSEQUENCES?

Concussion prevention, recognition and management require athletes to follow the rules and regulations of their sport, respect their opponents, avoid head contact and report suspected concussion. Baseline testing using any tool or combination of tools is not required to provide post-injury care of those who sustain a suspected or diagnosed concussion and mandatory pre-season testing is not recommended (Parachute Statement on Concussion Baseline Testing in Canada). This includes the Child SCAT6 and the SCAT6 tools, as well as neuropsychological and neurocognitive tests, both computerized or not. Baseline testing of youth and adult athletes that do not have access to dedicated sideline licensed healthcare professionals working with team physicians within a comprehensive concussion protocol is not recommended.

TO LEARN MORE ABOUT SPORTS RELATED CONCUSSION PLEASE VISIT:

Links to resources

- **Alpine Canada Concussion Protocol** : https://ltad.alpinecanada.org/uploads/documents/2017-2018_Concussion_Policy-PTSOCclub.pdf
 - *Awaiting update to 2023 guidelines to be published on ACA website*
- **Parachute** – Canadian Guideline on Concussion in Sport, 2nd edition and related resources: <https://parachute.ca/guideline>
- **Parachute** – Concussion guides, return-to-activity guides and general information: <https://parachute.ca/concussion>
- **SIRC** – Concussion in Sport resources (including recordings from SIRC’s Annual Concussion in Sport Symposium): <http://sirc.ca/concussion/>
- **CATT** - <https://cattonline.com>
- **Coaching Association of Canada** – Concussion awareness resources and NCCP Making Head Way in Sport e-Learning (updated version coming soon): <https://coach.ca/sport-safety/concussion-awareness>

Links to additional information

- Position statement of the Concussion in Para Sport Group (free access): <https://bjsm.bmj.com/content/55/21/1187#>

SIGNATURES: The following signatures certify that the athlete and his/her parent or legal guardian have reviewed the above information related to concussion.

_____	_____	_____
Printed name of athlete	Signature of athlete	Date
_____	_____	_____
Printed name of parent/guardian	Signature of parent/guardian	Date

RESOURCES USED TO DEVELOP THE SKI NB CONCUSSION PROTOCOL

1. Canadian Guideline on Concussion in Sport 2nd edition– Parachute Canada
2. Patricios, JS et al (2023). Consensus statement on concussion in sport – the 6th International Conference on concussion in sport held in Amsterdam, October 2022. BJSM, 57(11)



Date: _____ Athlete's Name: _____

To whom it may concern,

Athletes who are diagnosed with a concussion should be managed according to the Canadian Guideline on Concussion in Sport including the Return-to-School and Return-to-Sport Strategies. In pursuit of safe and speedy return of our athletes to competition, Ski NB requests that all athletes who have been diagnosed with a concussion have written medical clearance from their physician or nurse practitioner prior to returning to training and competition.

What if symptoms recur? Any athlete who has been cleared for physical activities, gym class or non-contact practice, and who has a recurrence of symptoms, should immediately remove himself or herself from the activity and inform the teacher or coach. If the symptoms subside, the athlete may continue to participate in these activities as tolerated.

Athletes who have been cleared for full contact practice or race must be able to participate in full-time school (or normal cognitive activity) as well as high intensity resistance and endurance exercise (including non-contact practice) without symptom recurrence. Any athlete who has been cleared for full-contact practice or race and has a recurrence of symptoms, should immediately remove himself or herself from play, inform their coach, and undergo medical assessment by a medical doctor or nurse practitioner before returning to full-contact practice or games.

Any athlete who returns to practices or games and sustains a new suspected concussion should be managed according to the Canadian Guideline on Concussion in Sport, 2nd edition.

Thank-you very much in advance for your participation in keeping our athletes safe.

Dr. Jeff Pike FRCPC Dip Sports Med, on behalf of Ski NB Board of Directors.

Accordingly, the above athlete has been medically cleared to participate in the following activities as tolerated effective the date stated above (please check all that apply):

- Symptom-limiting activity (cognitive and physical activities that don't provoke symptoms)
- Light aerobic activity (Walking or stationary cycling at slow to medium pace. No resistance training)
- Sport-specific exercise (Running or low intensity free skiing. No head impact activities)
- Non-contact practice – Working on technique outside of gates, half day only
- Full-contact practice – Full gates, full speed, full schedule
- Race Ready

Other comments: _____

Signature: _____ M.D. / N.P. (circle appropriate designation)*

Print/Stamp: _____



Medical Assessment for Concussion

Date : _____

Athlete's Name : _____

To whom it may concern :

Athletes who sustain a suspected concussion should be managed according to the *Canadian Guideline on Concussion in Sport*. Accordingly, you certify that you have personally completed a medical assessment for concussion on the above named athlete.

Results of medical assessment:

- This athlete has **not** been diagnosed with a concussion and can resume full participation in school, work, and sport activities without restriction.
- This athlete has **not** been diagnosed with concussion, **but** the assessment led to the following diagnoses and recommendations:

- This patient has been **diagnosed with a concussion**. This athlete has been instructed to avoid all recreational and organized sports activities that could potentially place them at risk of another concussion or head injury. Starting on _____ (date), I have advised that they be allowed to participate in school and low-risk activities as tolerated and only at levels that do not worsen their symptoms. They have been instructed that they will not be permitted to return to ski race training until the coach has been provided with a *Medical Clearance Letter* provided by the athlete/family and signed by a medical doctor or nurse practitioner in accordance with the *Canadian Guideline on Concussion in Sport*.

Other comments:

Signature: _____

Date: _____

Print/Stamp: _____

MD / Nurse Practitioner (circle one)

Thank-you very much in advance for your participation in keeping our athletes safe.

Dr. Jeff Pike FRCPC Dip Sports Med, on behalf of Ski NB Board or Directors