



## CLIMBING ESCALADE CANADA CONCUSSION PROTOCOL

*Adapted from: Parachute. (2017). Canadian Guideline on Concussion in Sport. [www.parachute.ca/concussion](http://www.parachute.ca/concussion)*

**Climbing Escalade Canada** has developed the **Climbing Escalade Canada Concussion Protocol** to help guide the management of participants who may have a suspected concussion as a result of participation in **Climbing Escalade Canada** activities.

### **Purpose**

This protocol covers the recognition, medical diagnosis, and management of participants, coaches, and trainers who may sustain a suspected concussion during a sport activity. It aims to ensure that participants with a suspected concussion receive timely and appropriate care and proper management to allow them to return back to their sport safely. This protocol may not address every possible clinical scenario that can occur during sport-related activities but includes critical elements based on the latest evidence and current expert consensus.

### **Who should use this protocol?**

This protocol is intended for use by all individuals who interact with participants inside and outside the context of school and non-school based organized sports activity, including participants, parents, coaches, officials, teachers, trainers, and licensed healthcare professionals.

For a summary of this protocol please refer to the [Climbing Escalade Canada Sport Concussion Pathway](#) figure at the end of this document.

### **How to read this guideline**

This guideline addresses 7 areas in the prevention, recognition, diagnosis, and management of sport related concussion:

1. [Pre-season education](#)
2. [Head injury recognition](#)
3. [Onsite assessment](#)
4. [Medical Assessment](#)
5. [Concussion management](#)
6. [Multidisciplinary concussion care](#)
7. [Return to sport](#)

For each area, recommendations are provided, along with:

- **Who:** Who are the people that play a key role to implement the recommendations in the area.
- **How:** What are the key tools and documents people can use to implement the recommendations in this area. All tools are included directly into this guideline.

**Role of Clinical Judgement:**

Several recommendations in this guideline are aimed at licensed healthcare professionals with the aim of helping them make informed decisions about their patients. However, this guideline is not intended to take place of clinical judgement in diagnosing and treating concussion. Healthcare professionals must make their own decisions about care after consultation with their patients, using their clinical judgement and knowledge and expertise.

**Key Term Definitions:**

**Concussion:** A form of traumatic brain injury induced by biomechanical forces that result in signs and symptoms that typically resolve spontaneously within 1-4 weeks of injury.

**Participant:** Any youth or adult participating in a school or non-school based sport activity, competing at any level of play (amateur or national team). This term refers to all sport participants and climbers.

**Youth or Youth Participant:** Any sport participant who is less than 18 years of age.

**Sport or sport activity:** A school or non-school based physical activity that can be played as an individual or a team including games and practices.

**Recognition:** The detection of an event (i.e. a suspected concussion) occurring during sports or a sport activity.

**Exercise:** Any physical activity that requires bodily movement including resistance training as well as aerobic and anaerobic exercise or training.

**Persistent symptoms:** Concussion symptoms lasting longer than 2 weeks after injury in adults and longer than 4 weeks after injury in youth.

**Licensed healthcare professional:** A healthcare provider who is licensed by a national professional regulatory body to provide concussion-related healthcare services that fall within their licensed scope of practice. Examples include medical doctors, nurses, physiotherapists, and athletic therapists.

Among licensed healthcare professionals, only medical doctors and nurse practitioners are qualified to conduct a comprehensive medical assessment and provide a concussion diagnosis in Canada. The types of medical doctors qualified to do such an evaluation are: pediatricians, family medicine, sports medicine, emergency department and rehabilitation (physiatrists) physicians; neurologists; and neurosurgeons.

**Medical Assessment:** The evaluation of an individual by a licensed healthcare professional to determine the presence or absence of a medical condition or disorder, such as a concussion.

**Treatment:** An intervention provided by a licensed healthcare professional to address a diagnosed medical condition/disorder or its associated symptoms, such as physical therapy.

**Multidisciplinary concussion clinic:** A facility or network of licensed healthcare professionals that provide assessment and treatment of concussion patients and are supervised by a physician with training and experience in concussion.

**Tool:** A standardized instrument or device that can be used to help recognize an event (i.e. a suspected concussion) or assess an individual with a suspected medical diagnosis (i.e. Sport Concussion Assessment Tool 5).

**Document:** A standardized written letter or form that can help facilitate communication between sport stakeholders.

**[Concussion Recognition Tool - 5th Edition \(CRT5\)](#):** A tool intended to be used for the identification of suspected concussion in children, youth, and adults. Published in 2017 by the concussion in Sport Group, the CRT5 replaces the previous Pocket Concussion Recognition Tool from 2013.

**[Sport Concussion Assessment Tool - 5th Edition \(SCAT5\)](#):** A standardized tool for evaluating concussions in individuals aged 13 years or older, designed for use by physicians and licensed healthcare professionals. Published in 2017 by the concussion in Sport Group, the SCAT5 replaces the previous SCAT3 from 2013.

**[Child Sport Concussion Assessment Tool - 5th Edition \(Child SCAT5\)](#):** A standardized tool for evaluating concussions in individuals aged 5 to 12 years or older, designed for use by physicians and licensed healthcare professionals. Published in 2017 by the concussion in Sport Group, the Child SCAT5 replaces the previous Child SCAT3 from 2013.

**[Return-to-School Strategy](#):** A graduated stepwise strategy for the process of recovery and return to academic activities after a concussion. The broader process of returning to cognitive activities has commonly been referred to as “return to learn”.

**[Climbing Canada Return to Sport Protocol](#):** A graduated stepwise strategy for the process of recovery and then return to climbing participation after a concussion. The broader process of returning unstructured and structured physical activity has been commonly referred to as “return to play”.

## 1.Pre-Season Education

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Despite recent increased attention focusing on concussion there is a continued need to improve concussion education and awareness. Optimizing the prevention and management of concussion depends highly on annual education of all sport stakeholders (participants, parents, coaches, officials, teachers, trainers, licensed healthcare professionals) on current evidence-informed approaches that can prevent concussion and more serious forms of head injury and help identify and manage a participant with a suspected concussion.

Concussion education should include information on:

- The definition of concussion
- Possible mechanisms of injury
- Common signs and symptoms
- Steps that can be taken to prevent concussions and other injuries from occurring in sport,
- What to do when a participant has suffered a suspected concussion or more serious head injury,
- What measures should be taken to ensure proper medical assessment,
- *Return-to-School* and *Return-to-Sport Strategies*
- Return to sport medical clearance requirements.

It is highly recommended that all parents and participants review and submit a signed copy of the [Pre-season Concussion Education Sheet](#) to their coach prior to the first training day of the season. In the case of Climbing Escalade Canada sanctioned event, the Pre-season Concussion Education Sheet will be a requirement for all stakeholders. In addition to reviewing information on concussion, it is also important that all sport stakeholders have a clear understanding of this protocol. For example, this can be accomplished through pre-season in-person orientation sessions for participants, parents, coaches and other sport stakeholders.

- **Who:** Participants, parents, coaches, officials, teachers, and trainers, licensed healthcare professionals
- **How:** [Pre-season Concussion Education Sheet](#)

## 2. Head Injury Recognition

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Although the formal diagnosis of concussion should be made following a medical assessment, all sport stakeholders including participants, parents, teachers, coaches, officials, and licensed healthcare professionals are responsible for the recognition and reporting of participants who may demonstrate visual signs of a head injury or who report concussion-related symptoms. This is particularly important because many sport and recreation venues will not have access to on-site licensed healthcare professionals.

A concussion should be suspected:

- In any participant who sustains a significant impact to the head, face, neck, or body and demonstrates *ANY* of the visual signs of a suspected concussion or reports *ANY* symptoms of a suspected concussion as detailed in the [Concussion Recognition Tool 5](#).
- If a participant reports *ANY* concussion symptoms to one of their peers, parents, teachers, or coaches or if anyone witnesses a participant exhibiting any of the visual signs of concussion.

In some cases, a participant may demonstrate signs or symptoms of a more severe head or spine injury including convulsions, worsening headaches, vomiting or neck pain. If a participant demonstrates any of the 'Red Flags' indicated by the [Concussion Recognition Tool 5](#), a more severe head or spine injury should be suspected, and Emergency Assessment (see point 3a below) should be pursued.

- **Who:** Participants, parents, coaches, officials, teachers, trainers, and licensed healthcare professionals.
- **How:** [Concussion Recognition Tool 5 \(CRT5\)](#)

### 3. Onsite Assessment

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Depending on the suspected severity of the injury, an initial assessment may be completed by emergency medical professionals or by an on-site licensed healthcare professional where available. In cases where a participant loses consciousness or it is suspected that a participant might have a more severe head or spine injury, Emergency Assessment by emergency medical professionals should take place (see 3a below). If a more severe injury is not suspected, the participant should undergo Sideline Assessment, depending on if there is a licensed healthcare professional present (see 3b below).

#### 3a. Emergency Assessment

If the participant is suspected of sustaining a more severe head or spine injury during training or competition, an ambulance should be called immediately to transfer the patient to the nearest emergency department.

Coaches, parents, teachers, trainers and officials should not make any effort to remove equipment or move the participant until an ambulance has arrived and the participant should not be left alone until the ambulance arrives. After the emergency medical services staff has completed the Emergency Assessment, the participant should be transferred to the nearest hospital for Medical Assessment. In the case of youth (under 18 years of age), the participant's parents should be contacted immediately to inform them of the participant's injury. For participants over 18 years of age, their emergency contact person should be contacted if one has been provided.

- **Who:** Emergency medical professionals. Paramedics would transfer to the hospital where emergency department staff would assess the participant in the hospital emergency department.

#### 3b. Sideline Assessment

If a participant is suspected of sustaining a concussion and there is no concern for a more serious head or spine injury, the participant should be immediately removed from the climbing area and competition until a Sideline Assessment has been completed to determine next steps.

##### **Scenario 1: If a licensed healthcare professional is present**

The participant should be taken to a quiet area and undergo Sideline Assessment using the Sport Concussion Assessment Tool 5 (SCAT5) or the Child SCAT5. The [SCAT5](#) and [Child SCAT5](#) are clinical tools that should only be used by a licensed healthcare professional that has experience using these tools. It is important to note that the results of [SCAT5](#) and [Child SCAT5](#) testing can be normal in the setting of acute concussion. As such, these tools can be used by licensed healthcare professionals to document initial neurological status but should not be used to make sideline return-to-sport decisions in youth participants. Any participant who is suspected of having sustained a concussion must not return to the competition or practice and must be referred for Medical Assessment.

***An assessment by a licensed healthcare professional is a requirement for return to sport on the same day and includes:***

1. ***No observable signs (see [Concussion Recognition Tool 5](#))***
2. ***No concussion symptoms***
3. ***Normal memory assessment***
4. ***Normal [SCAT5](#)***
5. ***Normal neurological, cervical spine, head and face exam***

In the case of national team-affiliated athletes (age 18 years and older), an experienced licensed healthcare professional, providing medical coverage for the sporting event may make the determination that a concussion has

not occurred based on the results of the Sideline Assessment. In these cases, the participant may be returned to the training or competition without a [Medical Clearance Letter](#), but this should be clearly communicated to the coaching staff. A participant that has been cleared to return to training or competition should be monitored for delayed symptoms. If the participant develops any delayed symptoms, they should be removed from play and undergo Medical Assessment (see 4. Below).

**Scenario 2: If there is no licensed healthcare professional present**

The participant should be referred immediately for Medical Assessment (see 4. below), and the participant must not return to play until receiving medical clearance.

- **Who:** Participants, parents, coaches, officials, teachers, trainers, and licensed healthcare professionals.
- **How:** [Concussion Recognition Tool 5 \(CRT5\)](#)

## 4. Medical Assessment

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In order to provide comprehensive evaluation of participants with a suspected concussion, the medical assessment must rule out more serious forms of traumatic brain and spine injuries, must rule out medical and neurological conditions that can present with concussion-like symptoms, and must make the diagnosis of concussion based on findings of the clinical history and physical examination and the evidence-based use of adjunctive tests as indicated (i.e. CT scan). In addition to nurse practitioners, medical doctors that are qualified to evaluate patients with a suspected concussion include: pediatricians; family medicine, sports medicine, emergency department, internal medicine, and rehabilitation (physiatrists) physicians; neurologists; and neurosurgeons.

In geographic regions of Canada with limited access to medical doctors (i.e. rural or northern communities), a licensed healthcare professional (i.e. nurse) with pre-arranged access to a medical doctor or nurse practitioner can facilitate this role. The medical assessment is responsible for determining whether the participant has been diagnosed with a concussion or not. Participants with a diagnosed concussion should be provided with a [Medical Assessment Letter](#) indicating a concussion has been diagnosed. Participants that are determined to have not sustained a concussion must be provided with a [Medical Assessment Letter](#) indicating a concussion has not been diagnosed and the participant can return to school, work and sports activities without restriction.

- **Who:** Medical doctor, nurse practitioner, nurse
- **How:** [Medical Assessment Letter](#)

## 5. Concussion Management

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When a participant has been diagnosed with a concussion, it is important that the participant’s parent/legal guardian is informed. All participants diagnosed with a concussion must be provided with a standardized [Medical Assessment Letter](#) that notifies the participant and their parents/legal guardians/spouse that they have been diagnosed with a concussion and may not return to any activities with a risk of concussion until medically cleared to do so by a medical doctor or nurse practitioner. Because the [Medical Assessment Letter](#) contains personal health information, it is the responsibility of the participant or their parent/legal guardian to provide this documentation to the participant’s coaches, teachers, and/or employers. It is also important for the participant to provide this information to sport organization officials that are responsible for injury reporting and concussion surveillance where applicable.

Participants diagnosed with a concussion should be provided with education about the signs and symptoms of concussion, strategies about how to manage their symptoms, the risks of returning to sport without medical clearance and recommendations regarding a gradual return to school and sport activities. Participants diagnosed with a concussion are to be managed according to their *Return-to-School and Sport-Specific Return-to-Sport Strategy* under the supervision of a medical doctor or nurse practitioner. When available, participants should be encouraged to work with the team therapist under guidance from the [Medical Assessment Letter](#) to optimize progression through their *Sport-Specific Return-to-Sport Strategy*. Once the participant has completed their *Return-to-School and Sport-Specific Return-to-Sport Strategy* and are deemed to be clinically recovered from their concussion, the medical doctor or nurse practitioner can consider the participant for a return to full sports activities and issue a [Medical Clearance Letter](#).

The stepwise progressions for [Return-to-School](#) and [Return-to-Sport Strategies](#) are outlined below. As indicated in stage 1 of the [Return-to-Sport Strategy](#), reintroduction of daily, school, and work activities using the [Return-to-School Strategy](#) must precede return to sport participation.

### ***Return-to-School Strategy***

The following is an outline of the *Return-to-School Strategy* that should be used to help student-participants, parents, and teachers to collaborate in allowing the participant to make a gradual return to school activities. Depending on the severity and type of the symptoms present student-participants will progress through the following stages at different rates. If the student-participant experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage. Participants should also be encouraged to ask their school if they have a school-specific Return-to-Learn Program in place to help student-participants make a gradual return to school.

**Table 1: Return to School**

Stage	Aim	Activity	Goal of each step
1	<b><i>Symptom-free activity</i></b>	Typical activities during the day as long as they do not increase symptoms (i.e. reading, texting, screen time). Start at 5-15 minutes at a time and gradually build up.	Gradual return to typical activities. <b><i>Limit to &lt;48 hours post injury.</i></b>

2	Return school to	<b><i>Sitting in classroom, limited participation, no homework, testing</i></b>	Increase tolerance to cognitive work
3	Return school to	Gradual introduction of schoolwork. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities
4	Return school to full-time	Resume all school activities, testing	Return to full academic activities and catch up on missed school work

McCrory et al. (2017). *Consensus statement on concussion in sport – the 5<sup>th</sup> international conference on concussion in sport held in Berlin, October 2016. British Journal of Sports Medicine, 51(11), 838-847.*

### **Climbing-Specific Return-to-Sport Strategy**

**N.B. Please refer to [Annex](#) for sport climbing discipline-specific details of returning to training.**

The following is an outline of the Return-to-Sport Strategy that should be used to help participants, coaches, trainers, and medical professionals to partner in allowing the participant to make a gradual return to sport activities. An initial period of 24-48 hours of avoiding symptom-causing activity is recommended before starting the *Climbing-Specific Return-to-Sport Strategy*. The participant should spend a minimum duration of 24 hours without symptom increases at each stage before progressing to the next one. If the participant experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage. It is important that youth and adult student-participants return to full-time school activities before progressing to stage 5 and 6 of the *Climbing-Specific Return-to-Sport Strategy*. It is also important that all participants provide their coach with a [Medical Clearance Letter](#) prior to returning to full sport activities.

- **Who:** Medical doctor, nurse practitioner. The team therapist under guidance of the [Medical Assessment Letter](#), where the final [Medical Clearance Letter](#) would be provided after a repeated medical assessment.
- **How:** *Return-to-Learn Strategy, Sport-Specific Return-to Sport Strategy, [Medical Assessment Letter](#)*

**Table 2: Climbing Canada Return To Sport Protocol:**

Stage <sup>a</sup>	Physical Preparation	Non-Climbing Movement	Sport Specific Methods	Boulder	Lead	Speed
1	Daily activities that do not provoke symptoms. Limit to <48 hrs post injury					
2	Stationary Bike (low intensity)	Mobility (low intensity)	Sport specific exercises not started.			

<b>3</b>	Stationary Bike (moderate intensity) Strength Training (low intensity, no holding breath )	Proprioception and Balance (low intensity) Visualization with Physical Rehearsal	Hangboard (static hangs, avoid holding breath/valsalva)	Light Traversing – with down climbing only.	Top-Rope Only (moderate intensity)	Up to ¾ speed 5m sections Up to ½ speed Full Runs
<b>4a</b>	Pre-Climbing Warm-Up Progress Strength Training	Proprioception and Balance (moderate intensity)	Hangboard (increased intensity, brief holding breath/valsalva ok)	Low Intensity Boulders up to Full Height with Position restrictions and down climb only*	Top-Rope Only (progress to full intensity) Circuits with Position restrictions and down climb only*	Up to Full Speed 5m sections Up to ¾ speed full Runs
<b>4b</b>	Pre-Climbing Warm-Up Progress Strength Training to Normal	Coordination/Agility Drills (agility ladder, etc)	Hangboard (increased intensity, holding breath/valsalva okay)	Progress Boulder Intensity keeping Position restrictions and down climb only*	Lead Climbing (low intensity with Position restrictions**)	
<b>5a</b>	Normal Pre-Climbing Warm-Up Strength Training	Higher Intensity Movement Exercise (Rings, TRX, Held balance positions, etc)	Dynamic FingerBoard Methods (Campus, etc)	Progress Boulder Intensity, falling practice to feet allowed from (1m,2m,3m), position restrictions*	Lead Climbing (moderate intensity with Position restrictions**)	Full Speed Runs (limited attempts)

5b	Normal Pre-Climbing Warm-Up Strength Training	Normal Movement Exercise Regime	Normal Hangboard/Fingerboard	Full Intensity Boulders (no position restrictions)* limit total attempts to 15.	Lead Climbing (full intensity no Position restrictions**) Limit total attempts to 15	
6	Return to sport, no restrictions					

*a: If the student-participant experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage.*

**\* Boulder Position Restrictions** – avoid positions that increase likelihood of fall on side, back or stomach (i.e. feet and hands at same height, feet overhead, foot first moves, etc). Also avoid friction dependent slab boulders with risk of hitting head/body because of a slip (volumes). Avoid inversions (head lower than heart).

**\*\* Lead Position Restrictions** – avoid positions that increase likelihood of inverted falls and collision with wall, volume, belayer (i.e. feet overhead, large distances between quickdraws, hard moves above severe wall angle changes – horizontal edges, difficult clipping positions in the first 4 quickdraws, vertical/slab terrain)

## 6. Multidisciplinary Concussion Care

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Most participants who sustain a concussion while participating in sport will make a complete recovery and be able to return to full school and sport activities within 1-4 weeks of injury. However, approximately 15-30% of individuals will experience symptoms that persist beyond this time frame. If available, individuals who experience persistent post-concussion symptoms (>4 weeks for youth participants, >2 weeks for adult participants) may benefit from referral to a medically supervised multidisciplinary concussion clinic that has access to professionals with licensed training in traumatic brain injury that may include experts in sport medicine, neuropsychology, physiotherapy, occupational therapy, neurology, neurosurgery, and rehabilitation medicine.

Referral to a multidisciplinary clinic for assessment should be made on an individualized basis at the discretion of a participant's medical doctor, nurse practitioner, or licensed healthcare professional. If access to a multidisciplinary concussion clinic is not available, a referral to a medical doctor with clinical training and experience in concussion (e.g. a sport medicine physician, neurologist, or rehabilitation medicine physician) should be considered for the purposes of developing an individualized treatment plan. Depending on the clinical presentation of the individual, this treatment plan may involve a variety of health care professionals with areas of expertise that address the specific needs of the participant based on the assessment findings.

- **Who:** Multidisciplinary medical team, medical doctor with clinical training and experience in concussion (e.g. a sports medicine physician, neurologist, or rehabilitation medicine physician), licensed healthcare professionals.

## 7. Return to Sport

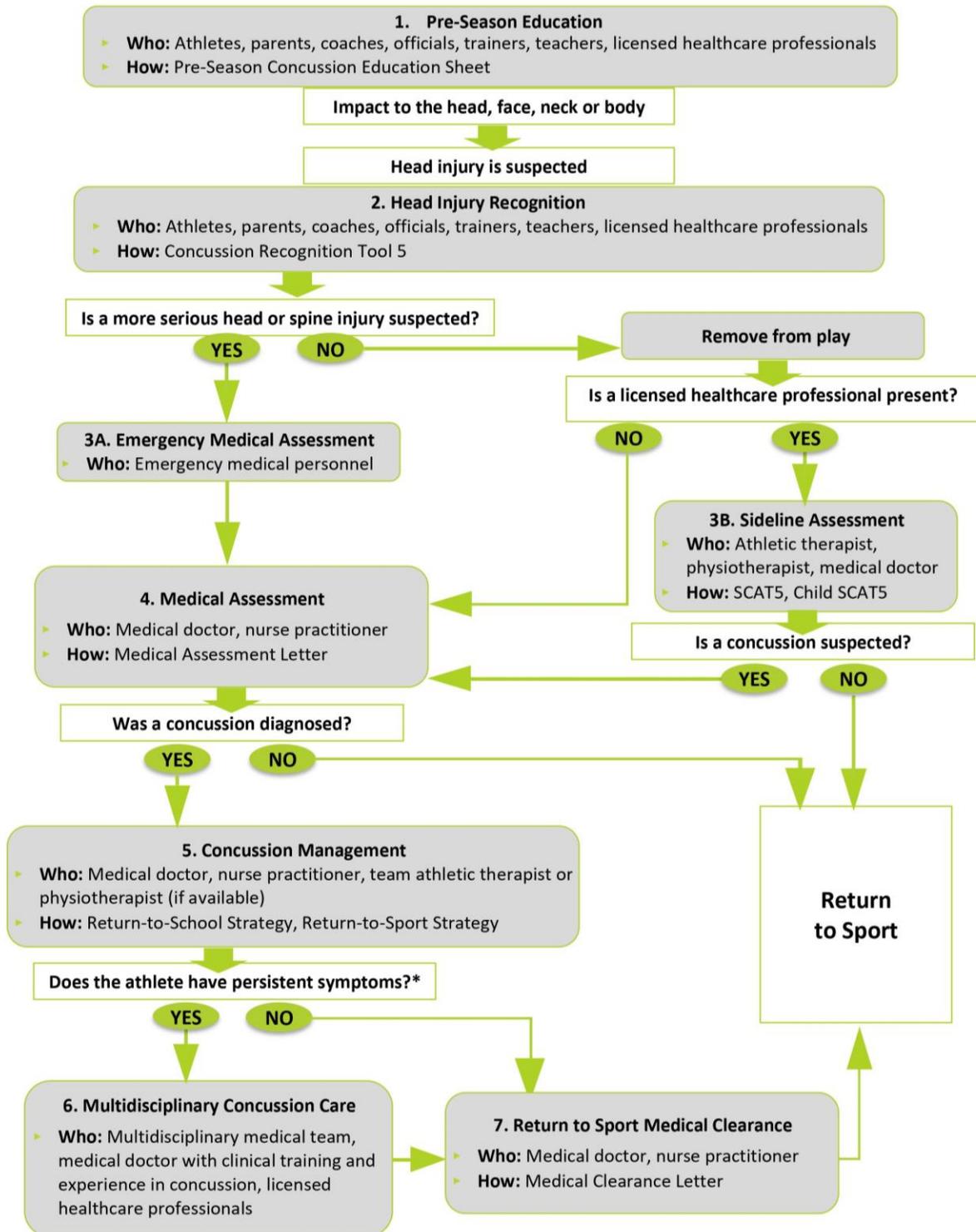
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Participants who have been determined to have not sustained a concussion and those that have been diagnosed with a concussion and have successfully completed their *Return-to-School* and *Climbing-Canada-Specific Return-to-Sport Strategy* can be considered for return to full sports activities. The final decision to medically clear a participant to return to full activity, training and competition should be based on the clinical judgment of the medical doctor or nurse practitioner taking into account the participant's past medical history, clinical history, physical examination findings and the results of other tests and clinical consultations where indicated (i.e. neuropsychological testing, diagnostic imaging). Prior to returning to full training and competition, each participant that has been diagnosed with a concussion must provide their coach with a standardized [Medical Clearance Letter](#) that specifies that a medical doctor or nurse practitioner has personally evaluated the patient and has cleared the participant to return to sports. In geographic regions of Canada with limited access to medical doctors (i.e. rural or northern communities), a licensed healthcare professional (such as a nurse) with pre-arranged access to a medical doctor or nurse practitioner can provide this documentation. A copy of the [Medical Clearance Letter](#) should also be submitted to sports organization officials that have injury reporting and surveillance programs where applicable.

Participants who have been provided with a [Medical Clearance Letter](#) may return to full sport activities as tolerated. If the participant experiences any new concussion-like symptoms while returning to sport, they should be instructed to stop climbing immediately, notify their parents, coaches, trainer or teachers, and undergo follow-up *Medical Assessment*. In the event that the participant sustains a new suspected concussion, the **Climbing Escalade Canada Concussion Protocol** should be followed as outlined here.

- **Who:** Medical doctor, nurse practitioner
- **Document:** [Medical Clearance Letter](#)

# Climbing Escalade Canada Concussion Pathway



\*Persistent symptoms: lasting > 4 weeks in children & youth or > 2 weeks in adults

**Annex:**

**Table 3 - Sport Climbing Event - Descriptions, effect on concussion domains, and modifications that can be made for rehabilitation**

Climbing event	Description	Type of activity/concussion domain	Modifications that can be made
<b>Boulder</b>	Cardiovascular - Anerobic, resistance Flexibility - High Direction - Multidirectional Height 4.5m Width – Problem specific Duration - 40-90 seconds Belay/Rope - None Other - Height and hanging positions major risk factors for head injury as well as the boulders themselves.	Autonomic - <b>mild heart rate variation</b> Balance/vestibular - <b>heavy</b> Cognitive - <b>heavy</b> C spine - <b>heavy</b> Valsalva <b>heavy</b> Visual – <b>moderate</b>	Topographic modification, height modification, coordination exercises on ground, having spotters when moving into un-restricted climbing positions.
<b>Lead</b>	Cardiovascular - Aerobic, resistance Flexibility - Moderate Direction - Mainly vertical with some traversing Height - Min 15m, up to 25m travel Width- Min 3m Duration – 4-6 min Belay/Rope/Location- Yes, manual, below Other – Enroute, the climber must clip into protection points. The height is the main concern regarding injury. Rope appears to be a potential source of injury. Belay also at risk for head injury.	Autonomic - <b>Mild heart rate variation</b> Balance/vestibular - <b>heavy</b> Cognitive <sup>1</sup> - <b>heavy</b> C spine - <b>heavy</b> Valsalva - <b>moderate</b> Visual - <b>moderate</b>	Topographic modification, reduce overall height during lead, skills practiced on <60cm vertical fall height un-rope circuits, if possible, have belayers/top rope, avoid wall angles between 0-15 degrees.
<b>Speed</b>	Cardiovascular load - Anaerobic, resistance Flexibility - Moderate Direction - predominantly vertical Height - 15m Width - 10m Duration - seconds Belay/Rope/Location - Yes, Automatic belayer system, from above. Other - appears to be low risk for head injury apart from height, given automatic belayer system.	Autonomic - <b>high heart rate variation</b> Balance/vestibular- <b>heavy</b> Cognitive <sup>1</sup> - <b>heavy</b> C spine - <b>heavy</b> Valsalva - <b>moderate</b> Visual - <b>heavy</b>	Topographic modification, spotters and use of automatic belayer system, reduce height, practice skills at a lower speed.

*Intensity of activity on domain - green - light, yellow - moderate, red - heavy*

<sup>1</sup>Cognitive domains include not only cognition but focus, attention, and concentration.

**Table 4 - Boulder**

Stage	Non-Climbing Movement	Sport-specific movement
1	Walking OR stationary bike (low intensity) as tolerated	None
2	Stationary bike (low intensity)	Mobility (Range of motion) <sup>1</sup>
3	Stationary bike (high intensity), visualization with physical rehearsal, pre-climbing warm-up, proprioception and balance - moderate intensity	Light traversing <sup>2</sup>
4	Pre climbing warm up introduce strength training to sub threshold (before causing sx)	Hang board, low intensity <sup>3</sup> boulders with position restrictions <sup>4</sup>
5	Progress to full strength training	Dynamic fingerboard, full boulder intensity without restrictions.
6	Full return	Full return

<sup>1</sup> - Grip exercises, hand - fine motor exercises

<sup>2</sup> - "feet no higher than 60cm or 2 feet

<sup>3</sup> - intensity reduction – we recommend static boulder problems at this stage, with potential for top rope protected bouldering routes.

<sup>4</sup> - Boulder Position Restrictions - avoid positions that increase likelihood of fall on side, back or stomach (i.e. feet and hands at same height, feet overhead, foot first moves, etc). Also avoid friction dependent slab boulders with risk of hitting head/body because of a slip (volumes).

**Table 5 - Lead**

Stage	Non-Climbing Movement	Sport-specific movement
1	Walking OR stationary bike (low intensity) as tolerated	Mobility, flexibility work as tolerated
2	Stationary bike moderate intensity, proprioception and balance, visualization	Grip, light traversing, static hangs
3	Stationary bike high intensity, initiate strength training. Physical rehearsal	Top-rope only, moderate - full intensity, hang board moderate - full intensity, un-rope low circuits <sup>1</sup> with position restrictions <sup>2</sup> .
4	Full strength training, rings, TRX, hold balance positions	Dynamic finger board methods (Campus etc). Lead climbing moderate - full intensity with position restrictions <sup>2</sup> .
5	Full return	Lead climbing full intensity without position restrictions <sup>2</sup> .

<sup>1</sup> - "feet no higher than 60cm or 2 feet

<sup>2</sup>Lead Position Restrictions – avoid positions that increase likelihood of inverted falls and collision with wall, volume, belayer (i.e. feet overhead, large distances between quickdraws, hard moves above severe wall angle changes – horizontal edges, difficult clipping positions in the first 4 quickdraws, vertical/slab terrain).

**Table 6 – Speed**

Stage	Non-Climbing Movement	Sport-specific movement
1	Walking OR stationary bike (low intensity) as tolerated	Grips on holds as tolerated
2	Stationary bike low intensity, initiate strength training, visual and physical rehearsal	Grip, footwork, holds, 1/4 speed climbing, hang board moderate intensity
3	Stationary bike high intensity	1/2 to 3/4 speed climbing, hang board full intensity, limit attempts
4	Full return	Full speed

## References and Resources:

1. Alpine Skiing Concussion Protocol:[https://ltad.alpinecanada.org/uploads/documents/2017-2018\\_Concussion\\_Policy-PTSOClub.pdf](https://ltad.alpinecanada.org/uploads/documents/2017-2018_Concussion_Policy-PTSOClub.pdf)
2. Archery Canada Concussion Protocol:<https://archerycanada.ca/wp-content/uploads/2019/07/Concussion-Policy-and-Protocol-Final-Updated.pdf>
3. Badminton Concussion Protocol:<https://www.badminton.ca/file/814564/?dl=1>
4. Basketball Canada: Concussion in Youth Sports:[https://www.basketball.ca/files/2016-02/canada\\_basketball\\_concussion\\_protocols.pdf](https://www.basketball.ca/files/2016-02/canada_basketball_concussion_protocols.pdf)
5. Biathlon Canada Sport Concussion Guidelines:<http://biathloncanada.ca/wp-content/uploads/2020/03/FINAL-DRAFT-Biathlon-Sport-Concussion-Guidelines-EN.pdf>
6. Canoe Kayak Canada's Concussion Protocol:<http://canoekayak.wpengine.com/wp-content/uploads/2018/06/CKC-Concussion-Protocol-EN.pdf>
7. Cycling Canada Head Injury/Concussion Protocol:  
[http://www.cyclingcanada.ca/disciplines/sites/default/files/CCA%20Concussion%20Protocol%202011\\_EN%282%29.pdf](http://www.cyclingcanada.ca/disciplines/sites/default/files/CCA%20Concussion%20Protocol%202011_EN%282%29.pdf)
8. Diving Plungeon Canada Concussion Protocol:<https://diving.ca/wpcontent/uploads/2019/02/Concussion-Protocol.pdf>
9. Canadian Fencing Federation Concussion Protocol:<http://fencing.ca/wp-content/uploads/Canadian-Fencing-Federation-Concussion-Protocol-EN.pdf>
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