

Concussion Guidebook

For Patients
& Caregivers





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01 Introduction

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Welcome to the Concussion Guidebook for Patients & Caregivers. If you or a loved one recently experienced a concussion, also known as mild traumatic brain injury (mTBI), or have lingering concussion symptoms, this guidebook can provide practical information and resources to help you on the journey to recovery.

How to Use This Guidebook

If you recently experienced a concussion and need time-sensitive information, please refer to the [Quick Guide to Concussion Management](#) section or the [Table of Contents](#) for specific focus areas.

This guidebook begins with general information about concussions before exploring deeper focus areas such as symptoms, treatments, talking with medical and mental health providers, return to activity, being a caregiver, inspiring stories from other patients and caregivers, and resources that can help create the best plan for you or your loved one's health.

While this resource is designed for patients and caregivers, the information included may be useful for coaches, teachers, athletic therapists, medical and mental health providers, or people who are simply interested in learning more about concussions.

Please note, this guidebook is not a substitute for professional evaluations and recommendations from a qualified medical or mental health provider.

Concussion vs Persistent Post-Concussion Symptoms (PPCS)

The majority of concussion symptoms will resolve within about two weeks. Although concussions are usually not life-threatening, the effects of a concussion can change a life and the injury should be treated seriously. Persistent post-concussion symptoms (PPCS), also known as Post-Concussion Syndrome (PCS), is the persistence of concussion symptoms beyond the normal course of recovery.

This guidebook contains information and resources for both recent concussions and persistent symptoms.



02 Quick Guide to Concussion Management

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- Red Flags for Seeking Emergency Services
- Steps to Take After Concussion
- CLF HelpLine





This section focuses on information that may be helpful to address your needs in the hours and days following a concussion.

Red Flags for Seeking Emergency Services

Individuals who have suffered a head injury should visit the Emergency Department immediately if any of the following warning signs are present:

- Seizures or convulsions
- Slurred speech
- Weakness, numbness, or decreased coordination
- Pupil changes
- Vision changes
- Increased confusion
- Agitation
- Discharge of fluid from nose and/or ears
- Loss of consciousness
- Repeated nausea and vomiting

Individuals should also visit the Emergency Department if any of the following complications arise in the hours and days after a head injury:

- A headache that won't go away
- Unusual behaviour, mood swings, or trouble concentrating
- Difficulty falling asleep or waking up
- Symptoms worsen or change in severity or character



EMERGENCY
ROOM

While it is typical for symptoms to be experienced in this timeline, each individual and injury is unique. If you have concerns for you or a loved ones' health following a head injury, you should seek Emergency Department services.



Steps to Take After Concussion

1

Seek Medical Care: Get evaluated by a medical professional. If there is any doubt, it's safer to assume you have a concussion until evaluation is possible. Sport concussion assessment tools are not always accurate, and symptoms can appear days later.

3

Prioritize Rest & Recovery: Get adequate amounts of sleep, nutrition, and hydration. Take time off from school or work to allow for healing and recovery.

5

Avoid Isolation: When possible, share what you are going through with loved ones or trusted friends. Withdrawing from all activity and communication can be harmful, as physical and social isolation can lead to feelings of anxiety and depression that make recovery harder.

7

Remember: While most concussions resolve within a few weeks, recovery can be a journey. It's okay to slow down if symptoms reappear. While keeping a positive attitude can be difficult when symptoms get in the way of responsibilities and obligations, giving yourself space to heal and staying positive are crucial components of recovery. No two concussions are exactly alike, and recovery does not always progress in a straight line.

2

Pause Activity: Reduce the risk for further head impacts and avoid exertion. Continuing to exert oneself physically or mentally can prolong the recovery process and increase the risk of life-threatening injuries and health complications.

4

Track Changes: Familiarize yourself with common concussion symptoms and make note of unusual physical, emotional, or cognitive changes. Record symptoms, including severity and frequency.

6

Gradually Return to Activity: With medical supervision, returning to moderate activity is advised. Scheduling breaks in activity can help avoid exertion. As symptoms subside, gradually return to pre injury levels of activity as tolerated. If symptoms worsen, decrease the level of physical and mental activity to allow more time for rest and healing to occur.



As much as possible, and especially within the first 24-48 hours, try to avoid:

- Physical or cognitive exertion
- Environments with lots of sensory stimuli (lights, sounds, crowds)
- Heavy use of screens or technology (TV, phone, computers)
- Alcohol and illicit drugs
- High-risk activity (collision sports, bad-weather, travel, physical work)
- Mental, physical, or emotional stressors



CLF HelpLine

The [CLF HelpLine](#) provides **personalized support** to those struggling with the outcomes of brain injury. Patients and caregivers navigating concussion or persistent post-concussion symptoms (PPCS) can reach out for help finding the right services, understanding treatment options, or having their questions answered.

If you or a loved one are seeking guidance on how to choose the right doctor, struggling with persisting concussion symptoms, or have any other specific questions, we want to hear from you: [Click here to request support](#)





03 Understanding Concussions

Jump to section 

- **What is a Concussion?**
- **What are the Signs & Symptoms of a Concussion?**
- **Mental Health Impacts**
- **Concussion Myths vs Facts**
- **Pediatric Considerations**
- **Persistent Post-Concussion Symptoms (PPCS)**





This section focuses on basic facts and key knowledge to support the decision making process during concussion recovery or caregiving for a loved one.

What is a Concussion?

A concussion is a type of traumatic brain injury (TBI), caused by a bump, blow, or jolt to the head or body that causes the head and brain to move rapidly back and forth^[1]. Rapid movement can cause brain tissue to change shape, which can stretch and damage brain cells. Chemical and metabolic changes within brain cells make it more difficult for cells to function and communicate. These changes in the brain can lead to symptoms that may affect how a person thinks, learns, acts, and sleeps^[2].

For more information, visit the Concussion Legacy Foundation Canada’s [What is a Concussion?](#) page.

Concussions are categorized as “mild” Traumatic Brain Injuries (mTBI). While concussions are generally not life-threatening, their effects can be life-altering and deserve serious consideration for one’s long-term health.



Concussion symptoms appear during the normal healing process and generally improve over time, typically within about two weeks^[3]. Some symptoms may appear right away, while other symptoms may not appear for hours or days after the injury. Many people do not realize they have some concussion symptoms until they try cognitively or physically demanding activities.



What are the Signs & Symptoms of a Concussion?

Knowing the signs and symptoms of a concussion is incredibly important because a concussion doesn't show up on imaging like an X-ray, CT, or MRI scan and there is no objective test, like drawing blood or saliva, that can determine if a patient has a concussion. A doctor makes a concussion diagnosis based on the results of a comprehensive examination, which includes observing signs of concussion and patients reporting symptoms of concussion appearing after an impact to the head or body. Concussion signs and symptoms are the brain's way of showing it is injured and not functioning normally.

Concussion signs are what someone could observe about you to determine if you have a concussion. Signs of a concussion range from obvious to much more nuanced, but even one sign of a concussion after a hit to the head should be reported to a medical professional.

Concussion signs include:

- Problems with balance
- Glazed look in the eyes
- Amnesia
- Delayed response to questions
- Inappropriate crying
- Inappropriate laughter
- Forgetting an instruction, confusion about an assignment, or position, or confusion of the game, score, or opponent
- Vomiting
- Loss of consciousness

Concussion symptoms are what someone who is concussed will tell you they are experiencing. When responding to a possible concussion in a child, remember that a concussed child may not be able to clearly communicate the symptoms they are experiencing because of their age and limited vocabulary, and the fact that they have just experienced a brain injury.



Concussion symptoms typically fall into four major categories:

Cognitive	Mood/Behaviour (Emotional)
<ul style="list-style-type: none">• Confusion• Slowed thinking• Difficulty focusing or concentrating• Forgetfulness• Trouble finding words or communicating• Short-term memory loss	<ul style="list-style-type: none">• Anxiety• Depression• Increased sadness• Irrational anger• Irritability• Social withdrawal
Somatic (Physical)	Sleep
<ul style="list-style-type: none">• Headache• Dizziness/light-headedness• Nausea• Sensitivity to light or noise• Blurry vision or double vision• Hearing issues• Balance issues• Fatigue or extreme tiredness• Changes in appetite• Changes in sex drive	<ul style="list-style-type: none">• Inconsistent sleep patterns• Sleeping more than usual• Sleeping less than usual• Trouble falling or staying asleep

Note: This is not an exhaustive list of concussion signs and symptoms, and it may take a few days for concussion symptoms to appear after the initial injury. These symptoms can also be caused by other conditions, such as depression or Post Traumatic Stress Disorder (PTSD). Consult a healthcare provider to determine the best assessment and treatment for symptoms.

Monitoring and documenting symptoms to share with your healthcare provider is a valuable practice. A detailed record offers insights into the progression of symptoms, highlighting improvements or areas where you may be facing ongoing challenges. Sharing a record of symptoms can help your healthcare provider tailor treatments more effectively for you or your loved one. For your convenience, an example of a symptom tracker is included in the Appendix.



Mental Health Impacts

It's not uncommon for concussion patients to experience new or worsening mental health challenges such as increased emotional sensitivity, irritability, difficulty falling or staying asleep, anxiety, or depression. These symptoms are real, and discussing them with a medical or mental health provider is important.



While most concussions resolve on their own, symptoms can be devastating and long-lasting.

Recent research has shown troubling links between concussions, mental health problems, and suicide.

A study from the Children's Hospital of Eastern Ontario (CHEO) found that, in a large cohort of youth aged 5-18, those who had concussions were 40% more likely to have mental health problems, hospitalization, and self-harm compared to those who had orthopedic injuries ^[4].

A 2018 Harvard University review showed that study subjects with a history of concussion were twice as likely to die by suicide and were at much higher risk of suffering from suicidal ideation or attempted suicide ^[5].

Delayed recognition and treatment of concussions can increase these risks and exacerbate the worst outcomes of concussions. Accessing proper care in the days and weeks following injury is crucial to improve short- and long-term recovery.





Concussion Myths vs Facts

Myth	Fact
You must lose consciousness to have a concussion.	Most concussions do not result in a loss of consciousness.
Signs and symptoms of a concussion are always apparent immediately after injury.	While symptoms often appear right away, it may take hours or days for concussion symptoms to appear after the initial injury.
Resting after a concussion means sitting in a dark room with no stimulation until they feel better.	After the first 48-hours following injury, someone recovering from a concussion should not spend all day in a dark room doing nothing ^[6] . Rest can include activities at home or outside if symptoms do not worsen for more than a brief period.
You should not sleep for 4 hours after injury.	After concussion is diagnosed, getting adequate rest & maintaining a consistent sleep schedule is an important part of the recovery process ^[7] .
Helmets and equipment prevent concussions.	Helmets can help prevent catastrophic injury but do not completely prevent concussion. No equipment can completely prevent a concussion.
It's better to have a brain injury as a child because younger brains are more resilient.	Children may be more susceptible to the chemical changes that occur in the brain after a concussion. The functional impact of concussions in children can differ from that in adults because the paediatric brain is still developing. Therefore, some children may not exhibit immediate effects of a concussion, but they may encounter challenges later in their development, especially as academic demands increase ^[8] .
I should not go to school, play, or work until all symptoms are resolved post-concussion.	Rest is important immediately after a concussion (first 48 hours). After that, activities should be gradually progressed as tolerated without severe exacerbation of symptoms.



Pediatric Considerations

Like adults, a child's concussion symptoms often resolve within several weeks after injury. Despite this similarity, children are at increased risk for persistent symptoms and delayed recovery.

The following factors have been associated with recovery complications and, if applicable, should be discussed with a medical or mental health provider to inform the recovery plan^[8]:

- Prior history of mTBI
- Lower cognitive ability (for children with an intracranial lesion)
- Neurological or psychiatric disorder
- Learning difficulties
- High number or high severity of initial symptoms
- Significant family and social stressors

Making temporary changes to daily activities while a child is recovering from a concussion can help them get back to a regular routine more quickly. Until cleared by a medical provider, it is important for children to avoid activities that put them at risk for another injury to the head and brain.

Every child is different. During the recovery process, decisions about their participation in household and school activities should be guided by their symptoms.

If a child's symptoms do not worsen during an activity, then that activity is generally ok for them. If symptoms worsen, activity should be cut back or modified^[9]. If you do not feel like your child is getting better, talk with their healthcare provider.

Keep track of your child's concussion symptoms and share them with the healthcare provider. This may help the healthcare provider identify the best treatment for your child's symptoms.



Infants, toddlers, and children with certain disabilities may lack communication or developmental skills to report the signs and symptoms of a brain injury. Clinicians and families should be aware of the following observable signs of a brain injury:

- Changes in the ability to pay attention
- Changes in eating or nursing habits
- Changes in play (e.g., loss of interest in favorite toys/activities)
- Changes in sleeping habits
- Irritability, persistent crying, and inability to be consoled
- Lethargy (i.e., deep and lasting drowsiness)
- Loss of acquired language
- Loss of new skills, such as toilet training
- Sensitivity to light and/or noise
- Unsteady walking, loss of balance



For infants and toddlers, acute deficits following a concussion tend to be in skill areas that are still developing at the time of injury. Lack of obvious changes following a concussion does not guarantee that they will not require services later. For skills that are not fully developed at the time of injury, later-onset symptoms can arise, including memory and attention deficits, language delay or deficits, or behavioural problems. Younger children are also more likely to have difficulties academically compared with children who were injured later in development^[10]. The full extent of deficits may become evident only as the child's brain matures, and expected skills fail to develop or do so more slowly^[11].



Persistent Post-Concussion Symptoms (PPCS)

Recovering from a concussion means your brain cells must return to normal function by rebalancing levels of chemicals, like sodium and calcium, inside and outside of the cell. This process takes a lot of energy, so it's important to conserve energy during recovery. When properly managed, the majority of concussion symptoms will resolve within a couple of weeks, however over-exertion of brain cells during recovery can cause symptoms to persist for months or even years.

A significant percentage (estimates vary between 10-30%) of concussion patients suffer from concussion symptoms persisting beyond the average course of recovery ^[12]. In cases where symptoms last longer than one or two months, doctors may diagnose persistent post-concussion symptoms (PPCS), also known as Post-Concussion Syndrome (PCS). Patients with PPCS can experience concussion-like symptoms at rest or in response to too much physical or cognitive activity, often forcing them to withdraw from their usual physical, professional, and social lives. While some changes may last for months or years, symptoms can and do eventually improve with the right support and treatment.





04 Building a Foundation of Medical and Mental Health Support

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- **When to See a Specialist**
- **Finding Specialty Providers**
- **How to Choose a Concussion Clinic**
- **Types of Medical and Mental Health Providers**
- **Evidence-Based Treatment Practices**
- **Talking With Your Doctor**
- **Nutrition Guidelines**
- **Additional Health Considerations**
- **Disputed or Alternative Treatment Practices**





One of the most important steps toward recovery following a concussion is establishing a foundation of medical and mental health providers for monitoring and treatment. No two concussions are exactly alike. Similarly, no two recovery journeys are identical.

Setting appropriate expectations for recovery is important. Concussion symptoms can have many causes, so a medical provider may recommend multiple treatments. Some treatments can take weeks to make noticeable improvements, emphasizing the importance of patience and observation. You or your loved one may need to try multiple therapies before finding one that works, meaning persistence is key.



Here's the good news: concussion symptoms, even persistent post-concussion symptoms (PPCS), also known as Post-Concussion Syndrome (PCS), can and do improve over time with appropriate care and accommodations. Care for PPCS often involves collaboration across an interdisciplinary team to address symptoms. Consulting with the patient's primary care physician or a concussion specialist is recommended to determine the most suitable treatments to pursue.



When to See a Specialist

It's best to seek medical attention after any suspected concussion for assessment and monitoring of symptoms. Depending on the signs and symptoms present after injury, this may include an Emergency Department visit immediately after injury, evaluation from a primary care provider, or assessment at a concussion clinic. Typically, symptoms resolve on their own within 2-4 weeks. In general, waiting several weeks after injury before beginning additional treatments is recommended to avoid overexertion of vulnerable brain cells. If symptoms persist, worsen, or cause challenges in returning to normal activity, consider obtaining referral to specialty care providers for targeted treatment options.

Finding Specialty Providers

If you have established care with a provider who is familiar with your medical history, such as a primary care physician, discussing options with them is generally the best starting point. They can help you decide on appropriate next steps, obtain referrals, or locate specialists for comprehensive care and targeted therapies as needed. If this is not an option, obtaining referral to speciality care may be possible through an Emergency Department or concussion clinic with advanced training practitioners on staff, such as MD, DO, NP, or PA, that does not require referral.

Finding care for a recent concussion can differ from persistent post-concussion symptoms. Some clinics and providers set restrictions such as requiring a referral or limiting intake to patients who experienced a concussion within the last 6 months. Clinical capabilities and limitations vary, so be sure to continue searching until you find a good fit for you or your loved one's needs.

You can reach out to [CLF HelpLine](#) for assistance locating options in your area.



How to Choose a Concussion Clinic

A concussion clinic is a comprehensive, multidisciplinary care facility with the ability to target multiple symptoms. Concussion clinics are a great option for recent or persistent symptoms. Here are five things to consider when evaluating concussion clinics:

1

How many concussion patients does the clinic see?

A medical or mental health provider who sees primarily concussion patients will be more familiar with the complexities of concussion recovery than a more general practitioner. If it's an option, choosing a concussion specialist can help avoid missteps through the recovery process that can potentially prolong symptom duration.

2

What level of medical training did the clinicians receive?

Your care team may eventually involve multiple specialties and include doctors, clinicians, therapists, and more. However, for an initial evaluation and to lead the care team, seek doctoral-level clinicians such as MD, DO, or a relevant PhD. In areas where these options are limited, NP or PA clinicians with advanced-level training and experience treating concussion may have more availability.

3

Are multiple disciplines represented on staff?

Concussions are complex injuries, and treatment could require multiple specialists. Look for a multidisciplinary team that may include neurologists, psychiatrists, neuropsychologists, psychologists, physical and occupational therapists, athletic therapists, and more. A clinic with a diverse staff of specialists is best.

4

How long has the clinic been open and seeing patients?

Resources for concussed patients continue to expand. Existing clinics are beginning to tailor their practices to the needs of concussion patients, and new clinics are opening faster than ever before; however, there is a learning curve, and practitioners at new clinics may be less experienced than specialists at established clinics.

5

Is the clinic affiliated with an accredited medical institution?

Most top-tier clinics are affiliated with hospitals or universities, and affiliated clinics tend to have more treatment or referral resources available. There are many notable exceptions of top-tier clinics operating independently. Nonetheless, affiliation with an accredited medical institution can be a helpful criteria to consider when weighing options.



Types of Medical and Mental Health Providers

The providers listed below can generally be relied upon for concussion assessments, evidence based treatment practices to address lingering concussion symptoms, or support navigating challenges associated with concussion recovery. While this list is not exhaustive and does not include all the multidisciplinary providers who may be part of a comprehensive care team, it offers a foundation of knowledge to build upon.

Provider Type	Function	Relevant Specializations
Athletic Therapist		
A certified and licensed healthcare professional who practices in the field of sports medicine.	Recognize and evaluate injuries. Provide first aid or emergency care. Develop and carry out rehabilitation programs for injured athletes. Plan & implement comprehensive programs to prevent injury and illness among athletes.	<ul style="list-style-type: none"> • Injury prevention • Initial assessment • Safe return to play
Case Manager		
<p>A plan developer and coordinator to connect clients to the services they need.</p> <p>Other titles: Care Coordinator Nurse Case Manager Transition Manager Patient Navigator Patient Care Facilitator Patient Services Manager</p>	Reduce chaos and confusion to help you focus on recovery or caregiving.	<ul style="list-style-type: none"> • Advocacy and mediation • Appointment reminders • Connection to resources • Insurance coverage navigation • Medical record transfers



Provider Type	Function	Relevant Specializations
Clinical Psychologist		
A PhD or PsyD educated, licensed mental health professional qualified to do counselling and psychotherapy, perform psychological testing, and provide treatment for mental disorders.	Evaluate, diagnose, and treat behavioural, emotional, and mental health disorders through cognitive behavioural therapy (CBT), psychoanalytic therapy, etc.	<ul style="list-style-type: none">• Adjustment issues• Behavioural problems• Emotional & psychological problems• Intellectual, cognitive, & neurological conditions• Interpersonal or social problems & dysfunction
Neurologist		
A medical doctor with specialized training in managing disorders of the brain and nervous system.	Treat disorders of the brain, spinal cord, nerves, and muscles.	<ul style="list-style-type: none">• Behavioural dysregulation• Blood panels• CT/MRI scans• Headaches & Seizures• Neurologic assessments• Sleep problems• TBI-mTBI/concussion• Neurodegenerative Diseases
Neuro-Ophthalmologist		
A medical doctor who specializes in neurology and ophthalmology, a specialty of medical and surgical eye care.	Diagnose and treat visual problems related to the nervous system (vision problems that do not necessarily come from the eyes themselves).	<ul style="list-style-type: none">• Broad medical or surgical options• Eye training• Neuro-Optometric Rehabilitation referrals• Rehabilitation therapy• Vision therapy
Neuro-Optometrist		
An optometrist with an additional year of training to specialize and work in vision therapy and neuro-optometry.	Evaluate visual strength, eye movements, double vision, sensory motor integration, field of view, accommodation, and binocular function. Stimulate parts of the brain not functioning to their highest potential following a brain injury.	<ul style="list-style-type: none">• Corrective lenses• Eye training• Neuro-Optometric Rehabilitation therapy• Vision therapy



Provider Type	Function	Relevant Specializations
Neuropsychologist		
A licensed clinical psychologist specializing in how the brain affects behaviour.	Administer cognitive and emotional tests. Provide treatment plans based on assessment.	<ul style="list-style-type: none">• Clinical psychotherapy• Neuropsychological assessments of cognitive function
Occupational Therapist		
A health professional who specializes in activities of daily living.	Assess patient needs and help patients develop, recover, improve, and maintain the skills needed for daily living and working by the adaptation of movement, improving motor skills, hand-eye coordination, or learning to do tasks in new ways.	<ul style="list-style-type: none">• Adaptive equipment recommendations for home life• Cognitive rehabilitation• Safe return-to learn/play/work• Vestibular therapy• Vision therapy
Peer Support Specialist		
Someone with lived experience and some training who can provide social and emotional support throughout the recovery process.	Provide support and help navigating the caregiver or recovery process.	<ul style="list-style-type: none">• Community connection• Emotional support• Problem solving brainstorm
Physiotherapist		
A health professional who specializes in movement disorders and graded exercise exposure.	Provides services that help restore body function, improve mobility, relieve pain, and prevent or limit permanent physical disabilities from an injury.	<ul style="list-style-type: none">• Headaches• Neck pain• Physical rehabilitation• Vestibular rehabilitation• Vision therapy



Provider Type	Function	Relevant Specializations
General Practitioner (GP)		
<p>A medical doctor who practices general healthcare and addresses a wide variety of health concerns.</p> <p>Other titles: Family Practice Physicians Internal Medicine Physicians Clinical Nurse Practitioners Physician Assistants</p>	<p>Coordinates ongoing care of all your family member's general medical needs.</p>	<ul style="list-style-type: none">• Care coordination and centralization• First-line care/guidance• Assessment/evaluation• Medication• Medication management• Referral to specialists
Psychiatrist		
<p>A medical doctor specializing in preventing, diagnosing, and treating mental illness.</p>	<p>Assess the mental and physical aspects of psychological problems.</p>	<ul style="list-style-type: none">• Medication management• Medication
Social Worker		
<p>A Registered Social Worker (RSW) is trained to evaluate and treat mental illnesses.</p>	<p>Trained in psychotherapy and helps individuals deal with mental health and daily living problems.</p>	<ul style="list-style-type: none">• Case management• Patient & family advocacy• Psychotherapy/counselling• Resource facilitation
Speech Language Pathologist (SLP)		
<p>A health professional who specializes in language and communication who may further specialize in addressing the communication and cognitive challenges that can arise after a TBI.</p>	<p>Provides assessment and targeted interventions for attention, processing, memory, problem-solving, & executive functions, word-finding, language comprehension, & challenges in expressing thoughts clearly.</p>	<ul style="list-style-type: none">• Adaptive technologies for work or school• Cognitive therapy• Memory training• Patient/family education• Re-establishing communication



Evidence-Based Treatment Practices

The treatments listed in this section are supported by evidence in peer-reviewed scientific studies. While this list is not exhaustive, it provides a broad overview of options frequently used to manage concussion symptoms. If you or a loved one are thinking about trying therapies not listed below, it may be worthwhile to consider supporting evidence and whether the potential benefits outweigh potential risk, time, and cost.

Treatment	Symptoms Targeted	Typical Providers
Cognitive Behavioural Therapy (CBT)		
A psychological therapy frequently used to treat mood and behaviour.	Anxiety Depression Impulsivity	<ul style="list-style-type: none"> • Clinical Psychologist • Mental Health Counsellor • Occupational Therapist • Social Worker
Cognitive Rehabilitation Therapy (CRT)		
Also known as cognitive therapy. A goal-oriented rehabilitation approach to address functional cognitive skills. Not the same as Cognitive Behavioural Therapy (CBT).	Attention Cognitive decline Communication Concentration Dizziness Executive functioning Fatigue Headache Information processing Language Memory Sensory sensitivities Sleep Vision impairment Word-finding skills	<ul style="list-style-type: none"> • Neuropsychologist • Occupational Therapist (trained in CRT for head trauma) • Speech-Language Pathologist (trained in CRT for head trauma)
Endocrinology		
Specifically, neuroendocrine assessment of pituitary function to determine if an initial TBI has caused hormonal imbalance.	Treatment-resistant: Brain fog Depression Fatigue Listlessness	<ul style="list-style-type: none"> • Endocrinologist • Neuroendocrinologist



Treatment	Symptoms Targeted	Typical Providers
Exertional Therapy		
<p>Performing light aerobic activity in a controlled and monitored environment.</p>	<p>Balance Fatigue Fear of activity/re-injury Sensory sensitivities</p>	<ul style="list-style-type: none"> • Athletic Therapist • Physiatrist • Physiotherapist
Mindfulness/Meditation		
<p>A practice where an individual uses a technique, such as meditation, to train attention and awareness to achieve mental clarity and emotional stability. A primary goal of this practice is to achieve greater awareness of one's internal experience and accept one's internal emotional or physiological state.</p>	<p>Anxiety Attention deficits Sleep disturbances</p>	<ul style="list-style-type: none"> • Mental Health Counsellor • Occupational Therapist • Speech Language Pathologist • Apps: Calm, Headspace, Insight Timer, CBT-i Coach
Neuropsychology		
<p>A branch of psychology focused on how the brain and nervous system influence a person's cognition & behaviour.</p>	<p>Anxiety Concentration Depression Impulsivity Memory Motor function Multitasking Word finding</p>	<ul style="list-style-type: none"> • Neuropsychologist
Occupational Therapy (OT)		
<p>The therapeutic use of everyday activities to help patients develop, recover, improve, and maintain the skills needed for daily living and working.</p>	<p>Communication Concentration Dizziness Executive function Fatigue Headache Language Memory loss Processing speed Sensory sensitivities Sleep Vision impairment</p>	<ul style="list-style-type: none"> • Occupational Therapist • Occupational Therapy Assistant



Treatment	Symptoms Targeted	Typical Providers
Otolaryngology (ENT)		
<p>Physicians that are trained to treat patients with diseases and disorders of the ear, nose, throat and related structures of the head or neck.</p>	<p>Dizziness Extreme noise sensitivity Tinnitus (ringing in the ears) Vertigo or balance issues</p>	<ul style="list-style-type: none"> • Otolaryngologist/ENT
Physiotherapy		
<p>Physical medicine and rehabilitation designed to promote recovery through means of exercise, manual therapy, and modalities.</p>	<p>Balance issues Fatigue Headaches Motor function Neck/shoulder pain for whiplash injury</p>	<ul style="list-style-type: none"> • Athletic Therapist • Physiatrist • Physiotherapist • Physiotherapist Assistant
Psychiatry		
<p>The medical specialty devoted to the diagnosis, prevention, and treatment of mental health disorders. Psychiatrists assess both the mental and physical aspects of psychological problems.</p>	<p>Anger/Rage Depression Detachment from reality (psychosis) Paranoia Personality changes Sustained hyperactivity (mania)</p>	<ul style="list-style-type: none"> • Psychiatrist
Vestibular Therapy		
<p>A wide range of techniques including habituation exercises, gaze stability training, and balance training.</p>	<p>Headaches Balance problems Persistent dizziness Vertigo</p>	<ul style="list-style-type: none"> • Audiologist • ENT • Neurologist • Physiatrist • Physiotherapist
Vision Therapy		
<p>A range of techniques designed to help retrain specific aspects of the visual system including eye teaming, visual processing, and visual-vestibular coordination.</p>	<p>Blurry vision Convergence insufficiency Dizziness/balance Double vision & eye strain Headaches & nausea Peripheral vision Sensitivity to light Sensitivity to motion</p>	<ul style="list-style-type: none"> • Neuro-Ophthalmologist • Neuro-Optometrist • Occupational Therapist • Physiatrist • Physiotherapist



Talking With Your Doctor

One of the first things a medical or mental health provider will ask for is a summary of your prior concussion history. Coming prepared to the first appointment will help streamline this process. It can be a challenge, especially if you're experiencing memory issues as a result of your concussion.

Here are a few tips:

Start with Diagnosed Concussions	Severity Matters
<p>If the individual has been diagnosed with a concussion before, have as much information about the injury ready as possible. Noting patterns from previous injuries can be helpful in predicting what recovery might look like.</p> <ul style="list-style-type: none">• When did it happen?• What caused the injury?• What symptoms were experienced?• How severe were those symptoms?• Did symptoms change as you or they recovered?	<p>It's important to remember not all concussions are equal and the severity of past concussions may be more important than the total number. It can be overwhelming going over a history of concussion, but focusing on severity is a helpful way to organize your thoughts.</p> <p>If you are unsure, the duration symptoms are experienced typically indicate greater severity of injury. Level of disruption to daily life resulting from a symptom compared to pre-injury function is another strong indicator.</p>
Timing of Injury Matters, Too	Consider Undiagnosed Concussions
<p>The interval between head injuries is important, as re-injury during recovery can cause major complications. Sustaining two concussions one-week apart is different than two concussions a year apart, even if they are of similar severity. Organizing a timeline with all past concussions for your doctor to reference when developing an appropriate return to activity or long-term concussion management plan can help.</p>	<p>Just because a concussion isn't formally diagnosed does not mean it didn't happen. After recounting the diagnosed concussions, consider other head injuries that have occurred and resulted in symptoms discussed here. Concussions can happen anywhere, so it is important to consider past injuries in sports, recreational activities, the military, or at work. Remember: "dings" and "bell ringers" count.</p>



Every concussion recovery is unique when considered as a whole; however, there are many commonalities between patients your healthcare provider may have encountered before.

Here are some example questions you could ask your doctor to help with navigating specific issues:

Medical History

- Will my concussion impact other pre-existing medical issues? (e.g., cardiovascular disease, mental health)?
- I'm taking a particular medication. Will that need to be adjusted?

Adjusting to Daily Life

- Will I need to make changes to my daily routine?
- When is it ok for me to return to normal activities? How should I make these decisions?

Resources for Recovery

- Will I need additional support during my recovery, and are there resources available?
- Are there things I can ask family or friends to do to help my recovery?





Nutrition Guidelines

Diet can be a helpful consideration during concussion recovery, as nutrition can impact brain function. Consult a qualified medical provider or registered dietician for individualized guidance to support recovery. Outlined below are general guidelines based on the current understanding of how dietary choices may impact recovery. Additional in-depth explorations of nutrition and concussion recovery can be found through organizations such as [UCLA Health](#) and [Brain Injury Canada](#), or, [watch this video with Registered Dietician Olivia Brooks](#). If you're in Ontario and would like to connect with Olivia please reach out to the [CLF HelpLine](#).

Consider a Mediterranean Diet: Evidence suggests that the Mediterranean Diet positively impacts overall brain health and may aid concussion recovery. This diet emphasizes minimally processed foods, such as fish, nuts, seeds, whole grains, and leafy green vegetables while avoiding large quantities of red meats.

Maintain general awareness of blood sugar levels: Evidence suggests maintaining stable blood sugar levels supports recovery. For most individuals, eating regular meals every 3-4 hours helps prevent hypoglycemia (low blood sugar) and ensures a consistent supply of glucose that your brain needs. During the healing process, there is an increased demand for glucose. Stable blood sugar helps support the healing process of the brain after a concussion. To help keep our blood sugar stable, it's important to pair foods that are mainly composed of simple sugars (i.e. fruits, white grains, etc.) with foods that contain slower-digesting nutrients (i.e. fibre, fat, protein). Examples of snacks: apples + peanut butter, crackers + cottage cheese, trail mix (nuts and dried fruit), and smoothies with Greek yogurt and fruit.

Monitor hydration: Adequate water intake supports overall well-being and contributes to an effective recovery process. Smoothies and soups/stews are also a great way to get nutrients and hydrate, and can be especially helpful with a low appetite because they can be packed with lots of nutrients.

The following page includes a table outlining items to limit and healthier substitutions for these items.



Nutrition Guidelines

Limit	Examples of	Substitutions for
<p>Alcohol</p>	<ul style="list-style-type: none"> • Wine • Beer • Liquors (e.g. vodka, whisky) • Cocktails • Alcohol-infused beverages 	<ul style="list-style-type: none"> • Water, still or sparkling • Naturally flavoured water, (e.g. lemon, cucumber)
<p>“Naked” Sugars</p>	<ul style="list-style-type: none"> • Table sugar • High-fructose corn syrup • Artificial sweeteners • Honey • Cane sugar • Agave • Sweetened beverages (e.g. soda, sweet tea) • Sweetened yogurt 	<ul style="list-style-type: none"> • Naturally flavoured water, (e.g. lemon, cucumber) • Coffee unsweetened (small amounts) • Apples • Fruits • Peanut butter, unsweetened • Cocoa, unsweetened • Greek yogurt, unsweetened
<p>Caffeine</p>	<ul style="list-style-type: none"> • Coffee (regular) • Energy drinks • Pop (cola some root beers) • Matcha • Chocolate (hot chocolate, chocolate bars) <p>*if avoiding caffeine entirely exacerbates symptoms, limit intake to mornings only so as not to disturb sleep.</p>	<ul style="list-style-type: none"> • Herbal tea • Decaffeinated green or black tea, unsweetened <p>OR</p> <ul style="list-style-type: none"> • Smaller amounts of regular decaffeinated coffee, unsweetened (or smaller amounts of regular)



Additional Health Considerations

Gut Microbiome Composition: The “gut microbiome” is a term used to describe the millions of bacteria in the intestinal tract which can impact many bodily functions. The gut microbiome can be influenced by the food and other substances we consume and meal consumption patterns such as timing. Taking steps to ensure a healthy, diverse gut microbiome can support overall health as we learn more about how it influences many facets of our health. Studies exploring disturbances in the microbiome and their influence on neurotransmitter production are ongoing and could lead to work that would explore the relationship between gut microbiome and concussion recovery ^[14].

Vitamins and Supplements: The most suitable application of vitamins and supplements is to complement a healthy diet by targeting specific nutrient deficiencies determined by a healthcare professional. This is done by conducting simple blood tests to assess levels of essential nutrients such as vitamin D, vitamin B-6, vitamin B-12, iron, magnesium, zinc, copper, and omega-3 fats ^[15]. If deficiencies are identified, healthcare professionals can offer guidance on appropriate dosages and recommend any necessary nutritional or lifestyle adjustments.

Overall, there is a need for more high-quality research on nutrition and concussion recovery in humans.






Disputed or Alternative Treatment Practices

This section includes treatment practices with varying degrees of consensus or dispute among medical researchers about whether it is an effective option for addressing concussion symptoms. Like other medical conditions, treatment practices for concussion symptoms are evaluated through publication of repeated studies in academic journals with rigorous peer review.

While this list is not exhaustive, it provides an example framework for patients to use when evaluating supporting evidence for a treatment option.



Careful thought is warranted when considering treatments that are expensive or not covered by insurance, are relatively new, or have existed for a long time but have not demonstrated effectiveness for the treatment of concussion symptoms through repeated studies in academic journals with rigorous peer-review. Before proceeding with treatment, consider supporting evidence and whether the potential benefits outweigh potential risk, time, and cost.

The extent of insurance coverage for these treatments varies among providers and insurance companies.

Consulting with your established care provider to weigh options is recommended.



Practice	Considerations	More Info
Acupuncture		
Insertion of very thin needles through the skin at specific points across the body.	<ul style="list-style-type: none">• Lacking evidence for concussion symptom management• Some demonstrated evidence for pain management and reduction in inflammation in the body	NIH - Acupuncture: What you need to know CMS – National Coverage Determination
Craniosacral Therapy (CST)		
A massage technique that uses light touch to release tension around your body's connective tissue.	<ul style="list-style-type: none">• Lacking evidence for concussion symptom management• Research needed to demonstrate efficacy for whiplash or other musculoskeletal injuries	NIH – Is Craniosacral Therapy Effective? A Systematic Review and Meta-Analysis
Eye Movement Desensitization Reprocessing (EMDR)/Brain Spotting (BSP)		
A psychotherapy that treats psychological symptoms following trauma.	<ul style="list-style-type: none">• Lacking evidence for concussion symptom management• Some emerging evidence for treatment of PTSD	Frontiers in Psych via NIH - EMDR as Treatment Option for Conditions Other Than PTSD: A Systematic Review
Hyperbaric Oxygen Therapy (HBOT)		
Breathing oxygen within a pressurized chamber.	<ul style="list-style-type: none">• No reliable evidence demonstrating effectiveness in treating concussion symptoms compared with placebo• Some demonstrated evidence for treatment of vascular issues	FDA – Hyperbaric Oxygen Therapy: Get the Facts CMS – National Coverage Determination



Practice

Considerations

More Info

Neurofeedback / EEG (electroencephalogram) Biofeedback

Use of a computer program to record brainwave activity in response to auditory or visual stimuli with the intent to help patients recognize and modify thought patterns.

- Lacking evidence for concussion symptom management
- Some emerging evidence for treatment of tinnitus, headache, and anxiety

CMS – [National Coverage Determination](#)

Transcranial Magnetic Stimulation (TMS)

A procedure that uses magnetic fields to stimulate nerve cells in the brain.

- More research needed for concussion symptom management
- Demonstrated evidence for treatment of intractable depression

NIMH – [Brain Stimulation Therapies: repetitive Transcranial magnetic stimulation](#)





05 Being a Caregiver and Advocate

Jump to section 

- Supporting Someone After Concussion
- Preparing for Setbacks
- Communicating With Your Loved One
- Advocating for Your Loved One





Supporting Someone After a Concussion

Whether you are supporting a child, spouse, family member, or close friend through concussion recovery, offering validation is a great place to start. This means believing what your loved one tells you about their symptoms and experiences. Living with a complex, invisible injury is difficult enough, but when you doubt your loved one's symptoms or imply that they are making them up, it can be devastating. Giving your loved one genuine validation and support can be more meaningful and beneficial to their recovery than you realize.

Here are additional ways to support your loved one:

- Help talk through the emotional challenges of the injury and let them know you see how challenging recovery can be.
- Be an advocate for them at school, in sports, and with medical and mental health providers.
- Prepare for the impact the injury can have on the whole family.
- Build a support team and realize you can't do it alone as a caregiver.

Preparing for Setbacks

Concussion recovery is not always a direct path, and no two concussions are the same. Setbacks from symptom resurgence can be disheartening. Without a set timeline for recovery, it can be hard to know if you or your loved one is making progress. It can be even more difficult when there seem to be improvements one day that are gone the next. Try to remain patient and know setbacks are normal.

Here are some strategies to keep in mind:

- Setting and sticking to a routine, but adjusting as needed
- Providing support for fluctuating emotions and personality
- Track symptoms and explore additional evidence-based treatment options

Communicating with Your Loved One

Many patients have trouble with interpersonal communication after a concussion or brain injury. It's important to keep this in mind as you work with your loved one to continue to support them through this recovery journey. These tip sheets from [Brainline](#) and [MIT](#) offer helpful strategies for maintaining clear and effective communication.



Advocating for Your Loved One

Ensure Appropriate Screening

Confirm that screening is conducted by an appropriate healthcare professional. The SCAT6, or the most current screening tool, should be utilized for student-athletes to gauge their injury accurately. For help identifying an appropriate medical professional, please consult with your doctor or reference the [Types of Medical and Mental Health Providers](#) table.

Seek Referral to Specialists

Obtaining a referral to a concussion or brain injury specialist for expert care tailored to their needs may require patience and persistence. You can support your loved one by offering context to support the need for additional care.

Discuss Recommended Guidelines with Healthcare Providers

Initiate conversations with medical providers about adhering to recommended return to school, learn, play, and work guidelines. More information on these considerations are provided later in this guidebook.

Secure Medical Records

Obtain the appropriate release of information or copies of medical records to bring to mental and medical health provider visits, as appropriate. For general guidance on health record disclosure, consult the privacy laws and personal health information protection regulations in your province/territory. Consider establishing power of attorney, a medical proxy, or a substitute decision-maker for streamlined decision-making if your loved one has difficulties with memory or decision-making.

Respectful Communication

Strive to maintain trust with your loved one and foster an atmosphere of respect in medical conversations by keeping them involved in conversations about their health and avoiding speaking as if they are not present. Communication difficulties are common among concussion patients.

Ask Questions and Document Answers

If your loved one is struggling with energy levels or cognitive function, it can help to actively participate in discussions by posing relevant questions and diligently recording responses to maintain a clear overview of your loved one's medical journey.

Engage with a Case Manager

Working with a Case Manager can optimize your experience through an intricate advocacy process, offering valuable support and insights.

Collaborate with Athletic Therapists

If available and relevant, collaborate with athletic therapists on comprehensive return-to-play, return-to-learn, or return-to-work protocols for a safe return to activities.

Stay Organized

Keep a binder, folder, or digital record to easily access important documents and information.



06 Self Care

Jump to section 

- **What is Burnout?**
- **Look After Yourself**
- **Self-Advocacy for Patients**
- **Self-Advocacy for Caregivers**
- **Creating a Support Network after a Concussion**
- **Creating a Resource Toolbox**
- **CLF Peer Support Programs**





Navigating concussion or persistent post-concussion symptoms (PPCS), also known as Post-Concussion Syndrome (PCS), can be an emotionally taxing journey whether you are the patient or a caregiver. The invisible nature of this injury adds an extra layer of complexity that can make it difficult for others to fully grasp the extent of the pain and challenges faced by a patient and their support system.

It's essential to recognize that, as someone managing the effects of a concussion or PPCS in yourself or a loved one, you may be susceptible to burnout. Prioritizing self-care becomes crucial, and seeking support from others who may be going through similar situations can make a significant difference.



Remember that you are not alone in this journey, and there are resources available to help you cope with the challenges of dealing with PPCS. Whether you're a patient or a caregiver, making time to care for yourself and accessing support is vital in navigating the complexities of an injury that may not always be visible to others.



What is Burnout?



Burnout is a state of physical, emotional, or mental exhaustion, accompanied by decreased motivation, lowered performance, and negative attitudes towards oneself and others.

Signs & Symptoms

Physical

- Feeling tired & drained most of the time
- Lowered immunity, frequent illnesses
- Frequent headaches or muscle pain
- Change in appetite or sleep habits

Emotional

- Sense of failure and self-doubt
- Feeling helpless, trapped, & defeated
- Detachment, feeling alone in the world
- Loss of motivation
- Increasingly cynical and negative outlook
- Decreased satisfaction and sense of accomplishment

Behavioural

- Withdrawing from responsibilities
- Isolating from others
- Procrastinating, taking longer to get things done
- Using food, drugs, or alcohol to cope
- Taking frustrations out on others
- Skipping work or coming in late and leaving early



Look After Yourself

Setting aside time for self-care is an essential part of navigating the challenges of managing a concussion or persistent post-concussion symptoms (PPCS), whether you're a patient or a caregiver. Taking care of yourself is crucial for your well-being.

As a patient, recognizing the importance of self-care is key to your overall recovery and well-being. This could mean taking a “break” from focusing on recovery by making time for things you enjoy, provided symptoms are minimal or tolerable. For caregivers, dedicating time to self-care is equally vital. The demands of providing support and understanding can be emotionally taxing, making it essential for caregivers to recharge.

Put your healthcare needs first and reach out if you need help. Prioritize activities that build your physical, emotional, mental, and spiritual energy, such as:



Regular exercise



Mental health counseling



Meditation



Mindfulness



Reading



Listening to music



Cooking



Rest and Relaxation



Healthy diet



Socialization



Getting good sleep



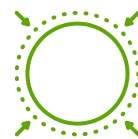
Engaging in hobbies



Journaling



Seeking support and help



Establishing and maintaining boundaries



Spending time in Nature



Self-Advocacy for Patients

As a **patient**, effective self-advocacy is crucial.

Here are recommendations to empower you in advocating for yourself:

Learn the basics of brain injury: Understanding your injury, symptoms, and treatment options equips you to advocate effectively by being well-informed about your own healthcare journey.

Find the right providers: Optimal care comes from medical and mental health providers with specialized knowledge in brain injuries. Refuse to compromise; seek professionals experienced in concussions and those you trust. For recommendations, visit the [CLF HelpLine](#) for guidance on providers in your area.

Know your rights: Being aware of your rights as a patient ensures you receive fair and appropriate treatment. Health and privacy laws vary by province/territory, with specific regulations governing patient rights and protections. Familiarize yourself with your province/territory laws to advocate for the care you deserve. Consider reaching out to your local Brain Injury Association for support.

Set Expectations: Establishing clear needs and boundaries in your school, work, or healthcare interactions can maintain your comfort throughout your recovery by creating a shared understanding. Communicate your limits to contribute to respectful and effective relationships.

Ask for support: Don't hesitate to seek support from friends, family, or support groups. Asking for assistance when needed is a sign of strength, and a supportive network can play a crucial role in your recovery journey. By incorporating these practices into your self-advocacy toolkit, you can navigate your brain injury journey with confidence and ensure you receive the best possible care.



Self-Advocacy for Caregivers

As a **caregiver**, advocating for both your loved one and yourself is crucial.

Here are recommendations on how to effectively advocate for yourself:

Learn the basics of brain injury: Understanding the facts about brain injuries and symptoms enables you to empathize with your loved one. This knowledge forms a foundation for providing better support and can highlight the steps you can take to minimize the impact these injuries can have on your close relationships.

Explore family resources: Inquire with medical and mental health providers about available resources for your family. This may involve seeking family counselling, exploring respite care options, and accessing additional support services. Understanding and utilizing these resources can contribute to the well-being of both you and your loved one.

Explore financial resources: Brain injuries often bring additional financial challenges, from medical expenses to necessary home accommodations. Collaborating with a Case Manager can assist you in identifying available financial resources that can alleviate some of the economic burdens associated with the care your loved one requires.

By incorporating these strategies into your approach, you not only enhance your ability to support your loved one but also prioritize your own well-being as a caregiver.



Creating a Support Network after a Concussion

It is crucial to create a caring and supportive network of loved ones, friends, medical professionals, and others that both patients and caregivers can rely on during their recovery. Engage in regular discussions with those you can trust and find reliable people who can provide support for needs that will emerge. Transparency about your experiences is key. Additionally, consider expanding your support network to include community groups or online forums where you can connect with others facing similar challenges. Examples of these resources are provided later in this section.

Creating a Resource Toolbox

A resource toolbox is your go-to list of supportive services and organizations that you can quickly access. It is always helpful to know who you can reach out to for additional support, guidance, information, and resources when times get tough. If you or your loved one needs help, do not hesitate to reach out.

The table below is an example list:

Organization	Contact
Suicide Crisis Helpline	Dial 988 Text 988
Suicide.ca (Quebec)	1-866-277-3553
Ground Support For Veterans - Crisis Line	1-888-228-3871
Canadian Centre on Substance Use and Addiction Helplines	Addiction Treatment Helplines
CopLine	1-800-267-5463
ShelterSafe Domestic Violence Helpline	Provincial/Territorial Lines
Canadian Mental Health Association (CMHA)	Find your CMHA
Government of Canada Mental Health Support Resources	Provincial/Territorial Resources
Concussion Legacy Foundation HelpLine	CLFHelpline



CLF Peer Support Programs

The [Concussion Legacy Foundation Canada](#) (CLFC) offers virtual peer support programs throughout the country.

Patients and caregivers dealing with a recent concussion or persistent post-concussion symptoms (PPCS) can reach out through the [CLF HelpLine](#) to join, or [register here](#).

Serving and non-serving Veterans can join our military support groups [here](#).

“I am very pleased that I found this resource. Truly, I think it was a lifesaver.”

[CLFC Zoom Support Groups:](#)

CLFC's support groups allow you to connect with other patients and caregivers across the country via Zoom.

CONNECT WITH THOSE WHO GET IT

CLF's private Facebook resources groups are here for you.



[CLFC PCS Resources Facebook Group:](#)

An online community focused on providing resources, support, and hope to those affected by ongoing concussion symptoms and persistent post-concussion (PPCS) symptoms.

CLF Peer Support Connection Program: Connect with Support



[CLF 1:1 Peer Support](#)

Connection: CLF's Peer Support Connection program offers 1-on-1 partnerships with trained volunteers who understand the unique challenges of experiencing a concussion and having persistent symptoms or being a caregiver for someone with PPCS. Volunteers are former patients and caregivers who have navigated similar challenges and want to give back to the brain-injured community by sharing what their own journey taught them.



07 Returning to Activity

Jump to section



- **Return-to-School**
- **Return-to-Learn**
- **Return-to-Play**
- **Return-to-Life/Work/Exercise**





Short-term changes to daily activities and avoiding activities that involve physical or mental exertion are key to a successful healing process. Like any medical diagnosis, concussion recovery requires direct involvement from a licensed healthcare professional with relevant training to guide a safe return to school, work, play, and life ^[16].



When facing decisions about returning to school, learning, play, life, or work it's helpful to remember the big picture.





Consider the progressive steps outlined in the Recovery from Concussion Protocol from [CDC Heads Up](#):

1

Rest: You or your loved one should take it easy the first 24-48 hours after the injury when the symptoms are more severe.

- Early on, limit physical and thinking/remembering activities to avoid symptoms getting worse.
- Avoid activities that put you or your loved one at risk for another injury to the head and brain.
- Get a good night's sleep and take naps during the day as needed.

2

Light Activity: As you or your loved one starts to feel better, gradually return to regular (non-strenuous) activities.

- Find relaxing activities at home. Avoid activities that put you or your loved one at risk for another injury to the head and brain.
- Return to school or work gradually. If symptoms do not worsen during an activity, then this activity is OK. If symptoms worsen, cut back on that activity until it is tolerated.
- Get maximum nighttime sleep. (Avoid screen time and loud music before bed, sleep in a dark room, and keep to a fixed bedtime and wake-up schedule.)
- Reduce or eliminate daytime naps.

3

Moderate Activity: When symptoms are mild and nearly gone, you or your loved one can return to most regular activities.

- Take breaks, or help your loved one do so, only if concussion symptoms worsen.
- Return to a regular school or work schedule.

4

Back to Regular Activity: "Recovery" from a concussion is when you or your loved one can do all regular activities without experiencing any symptoms.



Return-to-School

Every year, thousands of K-12 students sustain a concussion from accidental falls, sports, recreation, and motor-vehicle accidents. Among children, concussions are most common in those aged 0-4 and 15-19 years old and can come with debilitating symptoms ^[17]. The school nurse can be an essential coordinator for a return-to-school and return-to-learn program and can work across a care team to execute on medical and mental health provider recommendations. Providers can work with the family and school administrators to determine readiness for return-to-school and what accommodations are needed based on the number, type, and severity of symptoms experienced by the student.

All students should be monitored at school and follow a gradual support protocol while recovering from a concussion. The full effect of the injury may not be obvious at first, as some symptoms might not show up for hours or days.

For most students, only temporary or informal academic adjustments are needed as they recover from their concussion symptoms. However, some students might experience persistent symptoms that can last for months or longer that alters how they participate, learn, and perform in school. If this is the case, a more formal educational plan may be best to consider.

Following rest after a suspected concussion, best practices suggest academic accommodations may be necessary. This could include part-time schedules or regular breaks, especially when reading or looking at a computer screen. Many school nurses encourage students recovering from concussions to utilize their office as a quiet, dark place if a student needs to rest during the school day. It is important for students to communicate honestly about their symptoms and avoid exerting themselves, possibly worsening their symptoms and delaying recovery. Work with your primary care provider, school, and any specialists involved to create a return-to-learn schedule that meets you or your loved ones needs.

Emotional support is critical during concussion recovery, especially among teenagers. A student with a concussion would benefit from finding an advocate, whether it's a friend, teammate, coach, teacher, nurse, or school support staff member. An advocate who understands that concussion symptoms can be hard to notice or unknown and can speak up when the student may not be able. A student having someone in their corner while they are at school will lower the likelihood that they try to push through symptoms and offer more of the support they need.



Recommended Return-to-School Protocol

For more detailed recommendations on progressive return to school protocols, consider the steps outlined by [Concussion Awareness Training Tool \(CATT\)](#) adapted from [PedsConcussion](#), partially replicated below and shown in full in the [Appendix](#):

1

Return to activities of daily living and relative rest, as tolerated

- Maximum of 24-48 hours
- Activities at home such as social interactions and light walking that do not result in more than mild and brief exacerbation (worsening) of concussion symptoms, such as: preparing meals, housework, light walking.
- Minimize screen time for the first 24-48 hours following concussion.
- Avoid driving during the first 24-48 hours after a concussion.
- Contact the school to create a Return to School plan.
- After a maximum of 24-48 hours after injury, **begin step 2.**

2

Return to school activities as soon as possible, as tolerated

- Returning to school as soon as possible (as tolerated) is encouraged.
- Reading or other cognitive activities at school or at home. Goal: Increase tolerance to cognitive work and connect socially with peers.
- Take breaks and adapt activities if concussion symptom exacerbation (worsening) is more than mild and brief.
- Use of devices with screens may be gradually resumed, as tolerated.
- Clearance from your doctor is not required to return to low-risk in-person or at-home school activities.
- A complete absence from the school environment for more than one week is not generally recommended.
- Communicate with school on student's progression
- If school activities are tolerated, **begin step 3.**



3

Part-time or full-time days at school with accommodations, if needed

- Gradually reintroduce schoolwork.
- May require accommodations, such as: partial school days with access to breaks throughout the day, Academic accommodations (extra time to complete work, reduced workload) to tolerate the classroom or school environment.
- Communicate with school on student's progression.
- Gradually reduce accommodations and increase workload.
- If full days without concussion related accommodations are tolerated, **begin step 4.**

4

Return to school full-time

- Return to full days at school and academic activities without requiring accommodations related to the concussion.
- Note: Medical clearance is **NOT** required to return to school.
- Return to school and return to physical education (PE) or sports should follow return to play or return to sport.
- Full academic load with no academic accommodations related to the concussion.



Return-to-Learn

Academic Accommodations

A student experiencing symptoms following a head injury might not be able to take a full course load or learn as easily in class. This can be due to difficulty concentrating, headaches, memory issues, irritability, fatigue, environmental sensitivity (e.g., noise/light), and other symptoms.

As students gradually increase their cognitive stimulation and attend school with temporary or informal support, some symptoms might not resolve within the first month post-concussion. If symptoms persist and continue to impact a student's learning and success at school, it may be best to start the IEP process, depending on severity and impact. If you feel your child should be considered for the IEP Process, it is best to contact your local school administrator (homeschool, charter, and private school included) or your province's resources.

For more general information about the IEP Process, please see the [Academic Accommodations Section in the Appendix](#).





Return-to-Play

Continuing to participate in physical activity after a concussion can worsen concussion symptoms and increase the risk of further injury or even death. The CDC explains, “In rare cases, a dangerous collection of blood (hematoma) may form on the brain after a bump, blow, or jolt to the head or body and can squeeze the brain against the skull.” [18]

Parents, coaches, and officials are not expected to be able to diagnose a concussion, as that is the job of a medical professional. However, they must be aware of the signs and symptoms of a concussion, and if they suspect a concussion, then the student must stop playing.

All students who sustain a concussion need to be evaluated and cleared for participation by an athletic therapist or qualified person who verifies that they are currently trained in the evaluation and management of concussions. Contact the student’s primary care provider, explain what has happened, and follow their instructions. If the student is vomiting, has a severe headache, or is having difficulty staying awake or answering simple questions they should be taken to the Emergency Department.

Return to Learn, Return to Play, & Return to Work Resources

[PedsConcussion - Return to Activity/Sports and Return to School Protocol](#)

[PedsConcussion - Living Guidelines for Pediatrics Concussion](#)

[Living Concussion Guidelines - Return-to-Activity/Work/School Considerations](#) (Adult Guidelines, created for providers)

[CLF Concussion Game Plan Podcast Return to Learn After Concussion](#)

[CDC Heads Up](#)



Return-to-Life

Return-to-Work

When planning to return to work after a concussion, it's important to have a medical professional assess one's symptoms and cognitive abilities carefully. To support a quick recovery, it may be necessary to limit routine activities of daily life^[19]. It may be advisable to restrict any or all work activities in the early stages of recovery to aid the healing process.

Return-to-Exercise

Returning to exercise should be a gradual process after a concussion, typically guided by a medical care team. ***The general guidelines given by the CDC is a four-stage progression:***

1

Rest: The first few days after a concussion you should rest. Limit physical and thinking/remembering activities to avoid symptoms getting worse.

2

Light Activity: After the first few days and as symptoms improve. Begin increasing your activity to return to non-strenuous activity. Avoid any activities that put you at risk for another head injury. Examples include walking, non-strenuous housework, relaxing activities at home, or return to work.

3

Moderate Activity: When symptoms are mild and nearly gone, you can return to most regular activities.

4

Back to Exercise: When you can do all regular activities without symptoms, you can return to exercising and continue to progress your intensity of exercise as tolerated.

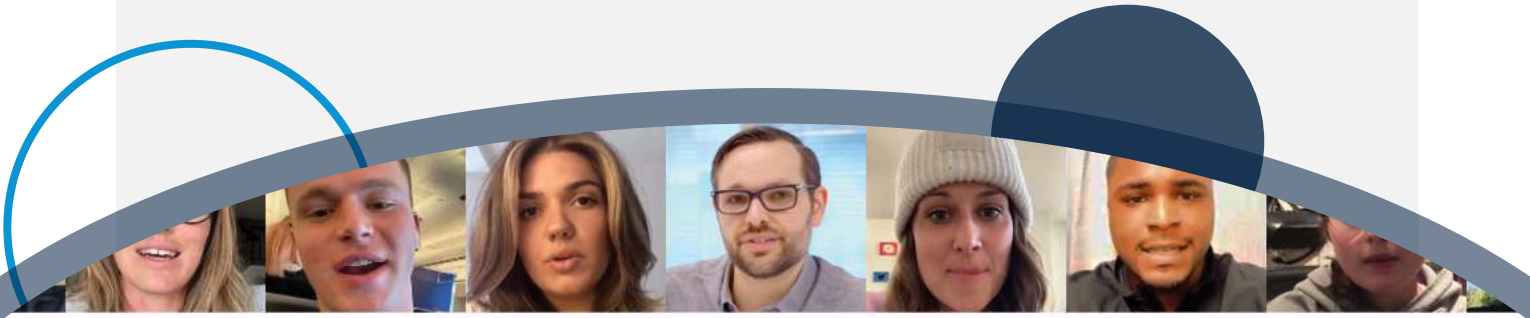
Exercise can be a fantastic way to relieve stress or boost mood, but it is important to monitor concussion symptoms before returning to a regular routine. Generally, exercise can be introduced so long as it does not worsen symptoms for more than a brief period. Exercise that involves low weight/resistance and avoids “bouncing the brain” are the best to start with, such as using an elliptical machine or stationary bike.



08 Additional Support and Resources

Jump to section

- Concussion Game Plan Podcast
- Concussion Recovery Corner
- Videos, Webinars, and Inspiring Stories
- Government and Non-profit
- Additional Peer Support Options
- Military
- Domestic Violence/Intimate Partner Violence



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Canada

Supporting athletes, Veterans, and all affected by concussions through messages of **#ConcussionHope**





Concussion Game Plan Podcast

[Concussion Game Plan](#), an official podcast from the Concussion Legacy Foundation, is designed to help patients and caregivers navigate acute concussion recovery. The top experts in the field lend their expertise to help guide you or your loved one through the concussion symptoms that can be expected, how long they may last, and how to best manage them.

Episode 1: Concussion 101



Each episode also features advice from someone who has suffered a concussion and handled the ups and downs of recovery.

Concussion can be an isolating, confusing injury. [Concussion Game Plan](#) is here to help and remind you that you or your loved one are not alone.

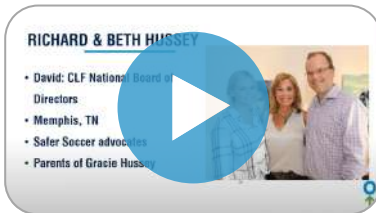
[Learn more](#)



Videos and Webinars



[Helping Your Child Cope with Post-Concussion Syndrome Pt. 1: Learn strategies from parents on how to help your child cope with PCS.](#)



[Helping Your Child Cope with Post-Concussion Syndrome Pt. 2: Learn strategies from parents on how to help your child cope with PCS.](#)



[Helping Concussion and Suspected CTE Patients in Crisis: How caregivers can support those struggling with severe symptoms.](#)



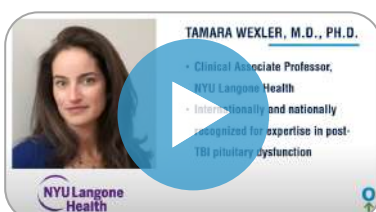
[How Physical Therapy Can Treat Post-Concussion Syndrome: How PT can help treat PCS, with patient accounts.](#)



[Dr. Robert Cantu on Management and Treatment of Post-Concussion Syndrome: How to medically manage and treat PCS, and advice for those who are recovering from PCS.](#)



[Impact of Concussion on Vision with Dr. Len Messner: How brain injuries can disrupt the visual system.](#)



[Neuroendocrine Dysfunction after Concussion: What Patients & Families Should Know](#)



Inspiring Stories

Looking for some inspiration? Here you'll find a gallery of stories of loss, recovery, community, and hope to help patients and families who are struggling.

Below, we share some of these stories:



Emily Folkard: Emily suffered two concussions in high school that ended her time in sport. Her experience with concussions and persistent post-concussion symptoms ultimately led to a decision to pursue an education in Neuroscience and an interest in the brain and the impacts of brain injuries on mental health.



Supporting a Loved One: Concussions and persistent post-concussion symptoms (PPCS), historically known as Post-Concussion Syndrome (PCS), can be overlooked, making it crucial for families to be part of the recovery journey with their loved one. In this story, **Ashley Fulton** shares about concussions in sport and the impacts concussions have on mental health, as well as how concussions and mental health affect not just the injured but those around them.



A Concussion Survivor Bringing Moms Together: **Allison Moir-Smith** is a mother who always pushed to do everything she could for her family, even following a concussion and following reinjury that complicated her recovery. Not content with giving in, Allison explored creative ways to help with her symptoms, and went on to start a Support Group for Mothers with Concussions. Today, Allison continues work as an advocate for those that suffer concussions and supporting those who are not seen as “traditional concussion patients”.



Government and Non-Profit Organizations

- [Canadian Mental Health Association \(CMHA\)](#)
- [Brain Injury Canada](#)
- [Government of Canada - Mental Health Support](#)
- [Kids Help Phone](#)
- [Canadian Centre on Substance Use and Addiction](#)
- [ShelterSafe - Shelters and Hotlines](#)
- [Government of Canada Family Violence Resources](#)





Additional Peer Support Options:

Peer support is a great way to connect with others who can relate to what you are going through.

In addition to the Concussion Legacy Foundation Canada programs listed in the **Self-Care** section above, the following is a list of groups and organizations offering virtual or in-person peer support options and local resources:

Group	Contact
Canadian Mental Health Association	<p><u>Canadian Mental Health Association:</u> The CMHA has branches across Canada, offering support for individuals facing mental health challenges and their families, including mental health programs and resources.</p> <p><u>BounceBack®:</u> BounceBack® is a free skill-building program from the CMHA designed to help adults and youth (15+) manage low mood, depression, anxiety, stress, or worry, to help improve mental health.</p>
eMentalHealth.ca	<p><u>eMentalHealth Directory:</u> eMentalHealth.ca provides a directory of mental health services and resources across Canada, including information sheets, free online screening tools, an events calendar, and the latest mental health news.</p>
Brain Injury Connect Canada	<p><u>Brain Injury Connect Canada:</u> An interactive service directory for individuals with brain injuries and their families. Providing access to services, organizations, and resources for treatment, rehabilitation, and recovery.</p>
Brainline	<p><u>Brainline Resource Directory:</u> A list of resources to meet needs for concussion and post-traumatic stress disorder (PTSD).</p>



Military

Note: The views expressed in this guidebook are those of the authors and do not necessarily represent the official policy or position of the Canadian Armed Forces, Veteran Affairs Canada, or any other government agency. For specific information, please contact the applicable agency.

Resources for Active-Duty Military, Primary Reserve, & Canadian Rangers

For service members, the primary resource for medical care is the Base Medical Officer, Care Delivery Unit (CDU), or the health services unit at your home military base. Depending on your needs, you may also be referred to a civilian healthcare provider within the provincial healthcare system.

Schedule an appointment with the CDU or Medical Officer at your base to discuss your history of head injury, and any symptoms you think might be related. They will conduct a medical assessment and may prescribe treatments to address your symptoms. If necessary, they might refer you for further evaluation or treatment with a civilian specialist, such as a certified care provider, Neurologist, Physiotherapist or Occupational Therapist, or to a specialized clinic for traumatic brain injuries (TBI) within the provincial healthcare system.



Operation Brain Health Support Line: Operated by the CLF HelpLine, the Operation Brain Health Support Line supports current and former serving members and their families.

Operation Brain Health Support Groups: provide a safe space for serving and non-serving Veterans to share experiences, ask questions, find resources, and connect with others.



Resources for Military Veterans

If you are enrolled with Veteran Affairs Canada (VAC) and the condition you are seeking treatment for has already been recognized by VAC as being related to service, your first point of contact for healthcare services is your family doctor or a VAC-approved healthcare provider.

If VAC has not already recognized the condition, you must submit a claim (or appeal if your claim has been denied). For assistance with claims, please see [page 63](#), Assistance with VAC.

If you have questions about your health coverage or VAC's treatment benefits program, call 1-866-522-2122 or [request an appointment with VAC](#). You can also contact [Medavie Blue Cross](#).

Additional Resource for Veterans, Caregivers, and Families

If you'd like to speak to a mental health professional, the [VAC Assistance Service](#) provides free and confidential support for all Veterans, former RCMP members, their families, and caregivers. Call 1-800-268-7708.



In addition, several national organizations provide support to veterans and their families.

- [Royal Canadian Legion](#)
- [Military Career Transition](#)
- [Operational Stress Injury Social Support \(OSISS\)](#)
- [Family Peer Support \(OSISS\)](#)
- [Veterans Affairs Canada \(VAC\) Assistance Services](#)
- [Wounded Warrior Project Canada](#)
- [Canadian Forces Income Support \(CFIS\)](#)
- [Support Our Troops](#)



Assistance with VAC

[The Royal Canadian Legion](#) offers support and assistance for serving and retired CAF and RCMP members and their families in accessing disability benefits, programs, and services from Veteran Affairs Canada (VAC).

The Legion's Professional Command Service Officers assist at the provincial and national level with:

- Preparing and submitting disability claims
- Information and advice about available VAC programs and benefits
- Professional advice and assistance in accessing other programs and benefits
- Support through the claims process, from the initial application to the Request for Reconsideration with the Veterans Review and Appeal Board

To access this resource, contact your local [Command Service Officer](#) or the [Support Line](#).

Whether you are a Legion member or not, all services Professional Command Legion Service Officers provide are free.

Domestic Violence/Intimate Partner Violence

TBIs from intimate partner violence are likely to be underreported. The following organizations offer resources and support:

- [Abused & Brain Injured Toolkit](#)
- [Dawn Canada Crisis Hotlines](#)
- [Ending Violence Association of Canada](#)
- [DomesticShelters.org](#)
- [Government of Canada Family Violence Resources](#)
- [Government of Canada: Provincial and Territorial](#)
- [Resources on Gender-Based Violence](#)



09 Conclusion

Jump to section 

- **Acknowledgements**
- **What is the Concussion Legacy Foundation Canada?**





The concussion recovery or caregiving journey can be incredibly challenging. From staying positive throughout your recovery or advocating for your loved one to prepare for the impact persistent symptoms can have on the individual and the whole family, the journey requires organization, patience, compassion and resourcefulness. One of the most valuable resources for patients and caregivers is hope.

Hope helps us keep going through our toughest challenges. Hope is the belief that there can be a better future, and it inspires us to take action. Hope helps reduce depression and improve mental health. Hope is a crucial component of recovery for people struggling with symptoms of concussion, and hope can be contagious.

Remember that you are not alone – explore and reach out to the resources described in this guidebook if you need recommendations, support, or guidance.

Acknowledgements

This guidebook was made possible by the generosity and dedication of experts, volunteers, and patients and caregivers with lived experiences.

The Concussion Legacy Foundation Canada would like to thank our donors for their support and Concussion Legacy Foundation US for the hard work they put into this guidebook we've adapted for Canadian patients and caregivers.



What is the Concussion Legacy Foundation Canada?

The **Concussion Legacy Foundation Canada** is a Canadian registered charity (83245441 RR 0001) with collaborators in the United States, Australia, and the United Kingdom.

It was founded by Tim Fleiszer to help solve the concussion crisis in Canada. CLFC's mission is to advance the study, treatment, and prevention of the effects of brain trauma and associated mental health implications in Canadian athletes, military personnel, youth, and other at-risk groups.

Our vision is a world without CTE, and concussion safety without compromise.

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10 Appendix and Helpful Templates

Jump to section 

- **Symptom Log**
- **Academic Accommodations and Return-to-School/Play**
 - **Individualized Education Plan (IEP)**
 - **Return-to-School Protocol**
- **Who is at Risk for Concussions**
- **Concussion (mTBI and TBI) Statistics**
- **Noteworthy Findings About TBIs**



Symptom Log

Click [here](#) to download the PDF from the Dr. Robert C. Cantu Concussion Center at Emerson Hospital.

Note: This Symptom Log is not intended to be used as a diagnostic tool. For any needs diagnosing a concussion, please seek the services of a medical health provider.

Academic Accommodations & Return To School | Play

Individualized Education Plans (IEPs)

An Individual Education Plan (IEP) supports students with unique learning needs, ensuring they receive necessary accommodations and services within the educational system.

An IEP outlines specific accommodations, modifications, and services required for a student to succeed academically. It is created based on assessments by school-based teams, which may include psychologists, educators, and other relevant specialists, and agreed upon by the school team and the student's family.

Who Qualifies for an IEP?

Students may qualify for an IEP for various reasons, including learning disabilities, physical disabilities, behavioural challenges, or other exceptionalities that affect their educational experience.

Students who have been identified with special education needs, either through a formal identification process or based on recommendations from teachers, specialists, or parents.

Students with persistent symptoms and who require assistance to participate fully in school may be eligible for an IEP.

To initiate the IEP process, families should contact their child's school or the school board's special education department to request an assessment.



Reviewing and Updating the IEP

IEPs must be reviewed regularly, annually at minimum, to ensure they meet the student's evolving needs. The review process includes assessing the student's progress, updating goals and accommodations, and making necessary modifications. This is a collaborative process involving input from educators, specialists, and the family to ensure the IEP aligns with the student's current academic and personal development needs.

Post-Secondary Academic Accommodations

Students pursuing post-secondary education may access accommodations through university and college accessibility centres, which recognize the impact that concussion symptoms can have on academic performance.

The support provided by accessibility centres is tailored to the student's individual needs; academic accommodations may include but are not limited to extended test time, note-taking assistance, and alternate format materials.

Each institution may have different program requirements and accommodations; it is important for students to work closely with academic support staff, course instructors, physicians, and disabilities services to create individualized management plans.

Additionally, students should pace their cognitive exertion to avoid exceeding the threshold at which concussion symptoms may worsen. This consideration extends to both academic activities and responsibilities outside of school, ensuring a smoother transition back to their studies.

Return-to-School Protocol

Click [here](#) to download the CATT tool, adapted from [PedsConcussion](#).



Who Is At Risk For Concussions?

While anyone can get a concussion, some people are at greater risk.

Age Specific Risk:

- Approximately 1.6% of Canadians aged 12 years or older reported sustaining one or more concussions in 2019 ^[22].
- Youth are especially vulnerable to concussions, with 11% of students in grades 6 to 10 reported having a diagnosed concussion ^[23]
- Canadians aged 65 and older experience the highest TBI mortality rates, with this group making up a substantial portion of TBI-related hospitalizations and fatalities. Among seniors, the risk increases significantly with age, and they account for a notable share of all TBI incidents, especially from falls ^[24].

Sex-Specific Risk:

- Males are disproportionately affected by traumatic brain injuries (TBI) in Canada, accounting for 63% of TBI-related hospitalizations between fiscal years 2018 and 2023. This higher incidence rate is seen across most age groups, with males consistently having more hospitalizations for TBI than females ^[28].
- A total of 12,602 youth athletes in Canada sustained concussions between 2012 and 2021, with the majority of these cases involving male athletes (78.5%) ^[29].

Race and Ethnicity-Specific Risk:

- Indigenous communities are disproportionately affected by TBI, they are three times more likely to be hospitalized as a result of brain injury compared to the rest of Canadians ^[30].
- Black patients with traumatic brain injuries (TBIs) are more likely to experience long-term impacts of TBI but also face limited access to rehabilitation services and poorer functional outcomes compared to White patients ^[31].
- Systemic barriers such as poverty, service locations, and lack of accessible housing reduce access to brain injury recovery resources for Indigenous, Black, People of Colour BIPOC communities, hindering their ability to achieve independence and return to work ^[32].



Individuals working in certain occupations have a higher risk according to CDC data:

- Law enforcement, firefighters, and emergency medical personnel
- Military
- Construction and building trades
- Machinists
- Professional drivers
- Loggers
- Miners
- Professional athletes

Participating in certain sports and recreational activities also has an increased risk:

- Football (especially tackle)
- Rugby
- Ice hockey
- Soccer
- Downhill skiing
- Snowboarding
- Gymnastics
- Cheerleading
- Equestrian sports (horseback riding)
- Riding a snow machine
- Riding an ATV
- Riding a bicycle
- Riding a motorcycle
- Riding a skateboard or scooter
- Ringette
- Sledding



Concussion (TBI & mTBI) Statistics

Understanding the prevalence and trends associated with concussions may provide valuable context to you or your loved one.

The frequency of injury in the public is difficult to establish. There are approximately 200,000 concussions annually in Canada^[33]. Each year in Canada, over 20,000 people are hospitalized for TBI, which can range from mild to severe and include concussions^[24].

Broadly, TBIs can range from mild to severe and may cause confusion, loss of consciousness, coma, or even death. TBIs have also been linked to various neurological problems like seizures or dementia, as well as conditions like anxiety, depression, or post-traumatic stress disorder (PTSD). TBIs can negatively affect childhood development, causing disturbances in normal learning, behaviour, and social interactions.

Although anyone can get a TBI, people living in rural areas are at a higher risk of TBI-related death compared to those in cities. One explanation could be difficulties accessing care, including lacking proper medical resources. A study conducted by the Canadian Institute for Health Information (CIHI) found that rural residents have significantly lower access to specialized medical services and longer travel distances to receive care, contributing to poorer health outcomes^[34].

In their 2020 report, **Rural and Remote Mental Health in Canada: Evidence Brief on Best and Promising Practices**, the Mental Health Commission of Canada offered guidance on addressing mental health crisis care in rural and remote areas. Providing evidence-based strategies specifically tailored to the unique challenges faced by these communities. For more information, see the full report [here](#).



Noteworthy Findings About TBI:

The CDC estimates that there are about 3 million TBI-related emergency department (ED) visits, hospitalizations, and deaths in the United States each year. The leading cause of all TBI-related ED visits is falls, which account for 48% of visits. Another leading cause is blunt trauma accidents, including being struck by or against an object and sports-related injuries. Injuries from a variety of sources – including vehicular accidents, abuse, and blast exposure – can also cause concussions to occur ^[24].

One of the leading causes of concussion is sport participation. Survey data from the National Concussion Surveillance System indicated approximately 6.9% of respondents' children had suffered at least one possible concussion in the last 12 months, primarily due to sports and recreational activities ^[17]. The risk of concussion can be greater in contact sports, with one study showing a fifteen-fold difference in head impacts experienced in a season between contact and flag Youth football players ^[26]. Only a fraction of all concussions are recognized and treated by medical professionals, demonstrated by the difference between suspected and diagnosed Youth concussion in National Health Surveys ^[27].

An athlete in any sport can suffer a concussion, either during practice or competitive play. In fact, according to a 2019 study by the Journal of Pediatrics, 36% of all diagnosed high school sport concussions occurred during practice, with cheerleading being the only sport with a higher rate during practice than competition.

Teenagers are especially vulnerable to concussion. A 2017 survey of teenagers by the CDC found that 2.5 million teenagers experienced a concussion in a sport or recreational activity, with 1 million teenagers reporting two concussions in the previous year. Analyses of concussion severity and recovery showed an increased risk of concussion among mid-adolescent youths compared to early and late adolescents. Though there were no age-specific associations or differences in concussion severity or recovery, additional research could investigate how risk changes across adolescence ^[20].



Noteworthy Findings About TBI in Canada:

Traumatic brain injuries (TBI) are a significant public health concern in Canada. By 2031, traumatic brain injury (TBI) is expected to be among the most common neurological conditions affecting Canadians, along with Alzheimer's disease and other dementias, and epilepsy ^[35].

Concussions, a common form of TBI, makeup around 74% of all reported TBIs across all ages ^[28].

Brain injury has been identified as a risk factor for Alzheimer's disease and other dementias in men, and epilepsy in both sexes ^[35].

One of the leading causes of concussion is sport participation. Between April 1, 2011, and February 12, 2024, the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) recorded that 14.8% of cases involving children aged 5 to 19 years and related to sporting and recreational activities were traumatic brain injuries (TBI) ^[28].

Data from the Canadian Community Health Survey (2020) indicated that approximately 1.6% of Canadians aged 12 years or older reported experiencing at least one or more concussions in 2019. Among youth aged 12 to 19, sports and recreational activities were the leading contributors to concussions, with hockey, rugby, and football among the highest-risk sports ^[22].

Despite the high incidence of concussions in these sports, a substantial number remain unrecognized or undiagnosed. In Canada one in six patients with concussion signs and symptoms were misdiagnosed in the emergency department ^[36].



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