

## Canadian Chiropractic Guideline Initiative (CCGI) Guideline Summary

<b>Title of guideline</b>	<b>Guideline for Concussion/Mild Traumatic Brain Injury &amp; Persistent Symptoms 3<sup>rd</sup> Edition</b>
<b>Author of guideline</b>	<b>Marshall S, et al.</b>
<b>Sponsor and Funder</b>	<b>Ontario Neurotrauma Foundation</b>
<b>Year of guideline publication</b>	<b>2018</b>
<b>Link to guideline</b>	<a href="http://braininjuryguidelines.org/concussion/">http://braininjuryguidelines.org/concussion/</a>

### Scope and purpose of guideline

- **Objective:** Diagnosis, assessment, and management of mild traumatic brain injury (mTBI)/concussion and persistent symptoms in adults.
- **Target Population:**
  - Adults (≥18 years) who have experienced concussion.
- **Target Users:** Healthcare professionals including primary care providers (family physicians, nurse practitioners), neurologists, physiatrists, psychiatrists, psychologists, occupational therapists, speech-language pathologists, physiotherapists, chiropractors, social workers, and counselors.
- **Health Condition:** mTBI/concussion
  - Acute neurophysiological event related to blunt impact or other mechanical energy applied to the head, neck or body (with transmitting forces to the brain), such as a sudden acceleration, deceleration or rotational forces.
  - Persistent symptoms (post-concussion symptoms): a variety of physical, cognitive, emotional and behavioural symptoms that may endure for weeks or months following a concussion.
  - Note: mTBI and concussion are used synonymously in this guideline. We will use the term concussion to mean both concussion and mTBI. At no time does the term concussion refer to moderate or severe TBI.

## OVERVIEW OF TOPICS

<b>A. DIAGNOSIS/ ASSESSMENT OF CONCUSSION</b>	<ul style="list-style-type: none"> <li>• Rule out <b>RED FLAGS</b></li> <li>• Comprehensive assessment</li> </ul>
<b>B. INITIAL MANAGEMENT OF CONCUSSION</b>	<ul style="list-style-type: none"> <li>• Principles</li> <li>• Overall approach (acute, subacute, persistent)</li> <li>• Education and self-management</li> </ul>
<b>C. <u>PERSISTENT SYMPTOMS AFTER CONCUSSION</u> (&gt;3 MONTHS)</b>	<ul style="list-style-type: none"> <li>• General assessment</li> <li>• General management</li> </ul>
<b>D. <u>SPECIFIC ASSESSMENT &amp; MANAGEMENT OF PERSISTENT SYMPTOMS AFTER CONCUSSION</u> (&gt;3 MONTHS)</b>	<ul style="list-style-type: none"> <li>• Post-traumatic headache</li> <li>• Sleep-wake disturbances</li> <li>• Mental health disorders</li> <li>• Cognitive difficulties</li> <li>• Vestibular (balance/dizziness) and vision dysfunction</li> <li>• Fatigue</li> </ul>
<b>E. RETURN TO ACTIVITY/WORK/SCHOOL</b>	<ul style="list-style-type: none"> <li>• Assessment</li> <li>• Management</li> <li>• Return to post-secondary school</li> </ul>
<b>F. SPORT-RELATED CONCUSSION</b>	<ul style="list-style-type: none"> <li>• Assessment</li> <li>• Management</li> <li>• Return to play</li> </ul>
<b>G. REFERRALS AND COLLABORATIONS</b>	<ul style="list-style-type: none"> <li>• Red flags</li> <li>• Beyond scope of practice</li> <li>• Treatment goals not met</li> </ul>

## KEY RECOMMENDATIONS

DIAGNOSIS/ASSESSMENT OF CONCUSSION	
	TOOLS
<b>Rule out RED FLAGS</b>	
<p>Refer to emergency department with <u>sudden onset</u> of any of:</p> <ul style="list-style-type: none"> <li>• Headaches that worsen</li> <li>• Seizures</li> <li>• Focal neurologic signs</li> <li>• Looks very drowsy/can't be awakened</li> <li>• Repeated vomiting</li> <li>• Slurred speech</li> <li>• Cannot recognize people or places</li> <li>• Increasing confusion or irritability</li> <li>• Weakness or numbness in arms/legs</li> <li>• Neck pain</li> <li>• Unusual behavioural change</li> <li>• Change in state of consciousness</li> </ul>	<p><a href="#">Canadian CT Head Rule (Fig. 1.1)</a></p>
<b>Comprehensive assessment</b>	
<p><b>1. Clinical signs of concussion</b> (any one sign or combination of):</p> <ol style="list-style-type: none"> <li>a) Loss of or decreased level of consciousness &lt;30 min;</li> <li>b) Lack of memory for events immediately before/after injury (post-traumatic amnesia) &lt;24 hours;</li> <li>c) Altered mental state e.g., confusion, disorientation, slowed thinking;</li> <li>d) Physical symptoms (see below).</li> </ol> <p><b>2. Health history</b> – assess/review the following:</p> <ol style="list-style-type: none"> <li>a) Current symptoms and health concerns Common symptoms: <ul style="list-style-type: none"> <li>• <i>Physical</i>: headache, nausea, vomiting, blurred or double vision, seeing stars or lights, balance problems, dizziness, sensitivity to light/noise, tinnitus, vertigo.</li> <li>• <i>Behavioural/Emotional</i>: drowsiness, fatigue/lethargy, irritability, depression, anxiety, sleeping more than usual, difficulty falling asleep.</li> <li>• <i>Cognitive</i>: feeling “slowed down”, “in a fog” or “dazed”, difficulty concentrating or remembering.</li> </ul> </li> <li>b) Setting and mechanism of injury</li> <li>c) Severity/duration of altered consciousness and immediate symptoms</li> <li>d) Concurrent injuries</li> <li>e) Pre-injury history: e.g., prior concussion(s), premorbid or concurrent conditions (physical or mental health conditions or difficulties, ADHD)</li> </ol>	<p><a href="#">ACE (Acute Concussion Evaluation) (App. 1.1)</a></p> <p><a href="#">Abbreviated Westmead PTA Scale (A-WPTAS) (App. 1.2)</a></p> <p><a href="#">Brain Injury Advice Card – Long version (App. 1.3)</a></p> <p><a href="#">Brain Injury Advice Card – Short version (App. 1.4)</a></p> <p>*Clinicians may use App 1.5 or App 1.6 (based on preference)</p> <p><a href="#">-Rivermead Post Concussion Symptoms Questionnaire (App. 1.5)</a></p> <p><a href="#">-Post-concussion Symptom Scale (App. 1.6)</a></p>

<p>f) Medications</p> <p>g) Factors that may delay recovery</p> <ol style="list-style-type: none"> <li>a. Medical Factors (pre-existing/concurrent medical conditions or post-injury symptoms that are associated with poor outcomes post mTBI).</li> <li>b. Contextual Factors (personal, psychosocial, or environmental factors that may negatively influence recovery post mTBI).</li> </ol> <p><b>3. Physical exam</b> Assess the following:</p> <ul style="list-style-type: none"> <li>• Mental status and cognition</li> <li>• Physical status</li> <li>• Cranial nerves</li> <li>• Extremity tone, strength, and reflexes</li> <li>• Gait and balance</li> <li>• Deterioration/improvement since injury</li> </ul>	<p><a href="#">Factors that may delay recovery (Table 1.1)</a></p>
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INITIAL MANAGEMENT OF CONCUSSION	
	TOOLS
<b>Principles</b>	
<ul style="list-style-type: none"> <li>• Focus on education, reassurance, self-management, active (vs. passive) time-limited care.</li> <li>• Management is symptom-based: treat specific symptoms including concurrent injuries according to evidence-based practice.</li> <li>• Address comorbidities.</li> <li>• Monitor for signs/symptoms that may require urgent medical referral.</li> <li>• Insufficient evidence to recommend complete rest beyond 24-48 hours.</li> <li>• Encourage return to activity/work/school even with symptoms (as tolerated).</li> </ul> <p><b>Symptom treatment hierarchy:</b> target symptoms that can be more easily managed or could delay recovery first, before focusing on more complex or difficult to treat symptoms. Some symptoms may exacerbate others.</p> <p><b>Primary symptoms</b> (to be addressed early):</p> <ul style="list-style-type: none"> <li>• Depression/anxiety/irritability</li> <li>• Sleep disturbance</li> <li>• Post-traumatic headache</li> </ul> <p><b>Secondary symptoms</b></p> <ul style="list-style-type: none"> <li>• Balance, dizziness/vertigo</li> </ul>	

<ul style="list-style-type: none"> <li>• Cognitive impairment</li> <li>• Fatigue</li> <li>• Tinnitus/noise intolerance</li> </ul>	
<b>Overall approach</b>	
<p><b>Acute (0-4 weeks):</b> Education, reassurance, sub-symptom threshold training, non-pharmacological interventions. Consider cognitive behavioural therapy if patient has psychosocial barriers to recovery (e.g., negative expectation of recovery, high anxiety).</p> <p><b>Sub-acute (4-12 weeks):</b> Manage specific symptoms (potentially interdisciplinary), graduated return to activity/work/school, refer to physician if patient is not improving or is worsening.</p> <p><b>Persistent (≥3 months):</b> Interdisciplinary management focused on returning to pre-injury activities.</p>	<p>Sub-system threshold training/activities: involves training or activities at the patient's tolerance level that aims to achieve maximal participation in pre-injury activities while minimizing symptom exacerbations. When symptom exacerbations occur, patients should be advised to temporarily reduce their physical and cognitive demands and resume graduated return-to-activity at a slower pace.</p>
<b>Education and self-management</b>	
<p>Provide verbal and printed information to patients and support persons at initial assessment and ongoing as required.</p> <p>Include information on:</p> <ul style="list-style-type: none"> <li>• <i>Symptoms and expected outcomes:</i> expect full recovery in majority of patients within a few days, weeks or months.</li> <li>• <i>Normalizing symptoms:</i> current symptoms are expected and common</li> <li>• <i>Gradual return to activities as tolerated:</i> does not result in a significant or prolonged exacerbation of symptoms.</li> <li>• Techniques to manage stress.</li> </ul>	<p><a href="#">Brain Injury Advice Card – Long version (App. 1.3)</a></p> <p><a href="#">Brain Injury Advice Card – Short version (App. 1.4)</a></p>

<b>PERSISTENT SYMPTOMS AFTER CONCUSSION (&gt;3 MONTHS)</b>	
	<b>TOOLS</b>
<b>General Assessment</b>	
<ul style="list-style-type: none"> <li>• Document symptoms using standardized concussion scales or others specific to treatment (e.g., Numerical Rating Scale and Neck Disability Index for neck pain).</li> <li>• Review currently prescribed medications, over-the-counter medications/supplements and substance use, including alcohol, marijuana and other recreational drugs.</li> </ul>	<p><a href="#">List of differential diagnoses (Table 4.1)</a></p> <p><a href="#">ICD-10 definitions for differential diagnosis related to concussion (App 4.1)</a></p>

<ul style="list-style-type: none"> <li>Consider differential diagnoses (persisting physical, cognitive, or psychological post-concussion symptoms can be nonspecific).</li> </ul>	<p>*Clinicians may use App 1.5 or App 1.6 (based on preference)</p> <ul style="list-style-type: none"> <li><a href="#">-Rivermead Post Concussion Symptoms Questionnaire (App 1.5)</a></li> <li><a href="#">-Post Concussion Symptom Scale (App 1.6)</a></li> </ul> <p><a href="#">Factors that may delay recovery (Table 1.1)</a></p>
<p><b>General Management</b></p>	
<p>Consider all factors that may contribute to persistence of symptoms. Interdisciplinary collaboration.</p> <p>Hyperbaric oxygen is not recommended.</p>	

<p><b>SPECIFIC ASSESSMENT &amp; MANAGEMENT OF <u>PERSISTENT SYMPTOMS</u> AFTER CONCUSSION (&gt;3 MONTHS)</b></p>	
	<p><b>TOOLS</b></p>
<p><b>Post-traumatic headache</b></p>	
<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>Comprehensive health history</li> <li>Identify headache subtype(s) that most closely resemble(s) the patient's symptoms (ICHD-III Beta).</li> <li>Perform neurological and musculoskeletal exam</li> </ul> <p><b>Management</b></p> <ul style="list-style-type: none"> <li>Tailor treatment to clinical features of headache and patient preferences.</li> <li>Educate patients: <ul style="list-style-type: none"> <li>Stimulus control (e.g., caffeine/tobacco/alcohol)</li> <li><a href="#">Strategies</a> such as: sleep hygiene, dietary modification, manual therapy and exercise, relaxation, environment modification</li> <li>Maintaining a <a href="#">headache diary</a></li> <li>Pharmacological interventions for acute pain and prevention of headache attacks (refer to physician)</li> </ul> </li> </ul>	<p><a href="#">Headache history (Table 6.1)</a></p> <p><a href="#">ICHD-III Beta classification criteria: acute headache (App 6.1), persistent headache (App 6.2), diagnostic criteria (App 6.3), medication-overuse headache (App 6.5)</a></p> <p><a href="#">Migraine Disability Assessment Questionnaire (MIDAS) (App F)</a></p> <p><a href="#">Headache Impact Test (HIT) (App F)</a></p>

	<p><a href="#">Self-management strategies (App 6.6)</a></p> <p><a href="#">Headache diary (App. 6.4)</a></p>
<b>Sleep-wake disturbances</b>	
<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• Screen for pre-existing sleep disturbances/disorders and the following which may influence the sleep/wake cycle:             <ul style="list-style-type: none"> <li>• Medical conditions: e.g., endocrine dysfunction, metabolic, pain-provoking.</li> <li>• Current <a href="#">medication use</a>.</li> <li>• Comorbid psychopathology: e.g., mood or anxiety disorder.</li> <li>• Unhealthy habits: e.g., lack of exercise, variable sleep-wake schedule, excessive napping, excessive time spent in bed, exercising close to bedtime; use of nicotine, caffeine, energy drinks, processed foods and processed sugars, alcohol, drugs, medications.</li> <li>• Physical: e.g., alterations in menstrual cycle, comorbid conditions, pain.</li> </ul> </li> </ul> <p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Educate and reassure that sleep alterations are common in acute stages</li> <li>• Treatment of sleep disorders may help to improve other post-concussive symptoms (mood, anxiety, pain, fatigue, cognitive problems)</li> <li>• <a href="#">Sleep hygiene</a></li> <li>• <a href="#">Behavioural interventions</a></li> <li>• Melatonin (take 2 hours before bedtime in conjunction with reduced evening light exposure and light therapy in the morning)</li> <li>• Magnesium and zinc supplementation (as per physician/dietician directions)</li> <li>• Acupuncture</li> <li>• Stress management strategies</li> <li>• Medical referral for pharmacological treatments</li> <li>• Medical referral if sleep disturbances persist</li> </ul>	<p><a href="#">Short clinical interview for sleep after head injury (App 7.2)</a></p> <p><a href="#">Sleep and Concussion Questionnaire (App 7.3)</a></p> <p><a href="#">Pittsburgh Sleep Quality Index</a></p> <p><a href="#">Medication use (App F)</a></p> <p><a href="#">Sleep hygiene (App 7.4)</a></p> <p><a href="#">Behavioural interventions (App 7.5)</a></p> <p><a href="#">Limiting time spent in bed to actual sleep time (App 7.7)</a></p> <p><a href="#">Re-creating time and place for sleep (App. 7.8)</a></p> <p><a href="#">Sleep diary (App 7.6)</a></p>
<b>Mental health disorders</b>	
<p><b>Assessment</b></p> <p>Screen for common mental health disorders, including:</p> <ul style="list-style-type: none"> <li>• <a href="#">Depressive disorders</a></li> <li>• <a href="#">Anxiety disorders</a> including Post-traumatic Stress Disorder (PTSD)</li> <li>• Behavioural changes (e.g., apathy, aggression, irritability)</li> <li>• Emotional regulation issues</li> </ul>	<p><a href="#">Patient Health Questionnaire 9-Item Scale (PHQ-9) for Depression (App. 8.1)</a></p>

<ul style="list-style-type: none"> <li>• <a href="#">Substance use disorders</a></li> <li>• Somatoform disorders</li> </ul> <p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Cognitive behavioural therapy for patients with persistent mood and anxiety issues</li> <li>• If a mental health disorder is present: treat according to clinical practice guidelines for that disorder</li> <li>• Refer to medical provider for pharmacological management</li> </ul>	<p><a href="#">Generalized Anxiety Disorder 7-Item Scale (GAD-7) (App 8.2)</a></p> <p>*Clinicians may use App 1.5 or App 1.6 (based on preference)</p> <ul style="list-style-type: none"> <li>-<a href="#">Primary Care PTSD Screen (PC-PTSD-5) (App 8.3)</a></li> <li>-<a href="#">PTSD Checklist (PCL-5) (App 8.4)</a></li> </ul> <p><a href="#">CAGE and CAGE-AID Questionnaire (App 8.5)</a></p>
<b>Cognitive difficulties</b>	
<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• Assess and track symptoms using a validated post-concussion symptoms questionnaire (e.g., Rivermead, PCSS).</li> <li>• Assess impact of cognitive difficulties on activity/work/school/community participation</li> </ul> <p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Educate patients that cognitive difficulties might be intensified by comorbidities (e.g., ADHD, learning disabilities, anxiety or mood disorders, pain, fatigue, sleep disturbance, neuroendocrine dysfunction, substance abuse, existing medications).</li> <li>• Refer to medical provider if symptoms are not resolving and continue to interfere in daily functioning beyond 4 weeks.</li> <li>• Implement/use neurorehabilitation strategies for patients with persisting cognitive impairments, and to facilitate resumption of activity/work/school/community participation.</li> <li>• Implement work/school accommodations, modifications, support.</li> </ul>	<p>*Clinicians may use App 1.5 or App 1.6 (based on preference)</p> <ul style="list-style-type: none"> <li>-<a href="#">Rivermead Post Concussion Symptoms Questionnaire (App 1.5)</a></li> <li>-<a href="#">Post-Concussion Symptom Scale (PCSS) (App 1.6)</a></li> </ul> <p><a href="#">SCAT5 (App 3.1)</a></p> <p><a href="#">Montreal Cognitive Assessment (MOCA) (App F)</a></p> <p>Neurorehabilitation strategies: aim to aid recovery from a nervous system injury, and to minimize and/or compensate for any functional alterations.</p>
<b>Vestibular (balance/dizziness) and vision dysfunction</b>	
<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• Assess vision, vestibular, balance and coordination, hearing, cervical spine (physical exam).</li> <li>• Assess for benign paroxysmal positional vertigo (BPPV) (Dix-Hallpike).</li> </ul> <p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Epley manoeuvre if Dix-Hallpike is positive</li> </ul>	<p><a href="#">Dizziness Handicap Inventory (App 10.1)</a></p> <p><a href="#">Dax-Hallpike Manoeuvre (PRM) (App 10.2)</a></p>



<ul style="list-style-type: none"> <li>• <a href="#">Vestibular rehabilitation therapy</a></li> <li>• <a href="#">Vision therapy</a></li> </ul>	<p><a href="#">Screening Techniques for Vision Dysfunction (App 10.4)</a></p> <p><a href="#">Brain Injury Vision Symptom Survey (BIVSS)</a></p> <p><a href="#">Balance Error Scoring System (BESS) (App F)</a> -<a href="#">Additional Resource</a></p> <p><a href="#">Particle Repositioning/Epley Manoeuvre (App 10.3)</a></p> <p>-<a href="#">Additional Resources Provided by CCGI</a></p> <ul style="list-style-type: none"> <li>-<a href="#">Epley Manoeuvre (video)</a></li> <li>-<a href="#">Vestibular rehabilitation therapy (web)</a></li> <li>-<a href="#">Vision Therapy (web)</a></li> </ul>
<p><b>Fatigue</b></p>	
<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• Assess frequency, intensity, time of day, aggravating factors, dimensions of fatigue (e.g., physical, mental, impact on motivation).</li> </ul> <p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Acknowledge that fatigue can be exacerbated by low mood or stress</li> <li>• Gradual increase in activity levels</li> <li>• Cognitive and physical activity pacing and fragmentation across the day.</li> <li>• Sleep hygiene</li> <li>• Diary to plan meaningful goals, record activity achievement and identify patterns of fatigue</li> <li>• Coping strategies</li> <li>• Medical referral: for blood test screening if appropriate (CBC, TSH, electrolytes); for secondary causes of fatigue: affective disorder (e.g., depression, anxiety); sleep disorder; metabolic causes (e.g., hypothyroidism, anemia); electrolyte abnormality (e.g., hyponatremia, hypocalcemia); polypharmacy or medication adverse effect</li> </ul>	<p><a href="#">Barrow Neurological Institute (BNI) Fatigue Scale (App 11.1)</a></p> <p><a href="#">Fatigue Severity Scale (FSS) (App F)</a> -<a href="#">Additional Resource</a></p> <p><a href="#">Fatigue Impact Scale (FIS) (App F)</a> -<a href="#">Additional Resource</a></p> <p><a href="#">Mental Fatigue Scale (App F)</a> -<a href="#">Additional Resource</a></p> <p><a href="#">Patient Advice Sheet on Coping Strategies for Fatigue (App 11.3)</a></p> <p><a href="#">Gradually Increasing Physical Activity to Better</a></p>

	<p><a href="#">Manage Fatigue (App 11.4)</a></p> <p><a href="#">Parkwood Pacing Graphs (App 2.2)</a></p> <p><a href="#">Sleep hygiene (App 7.4)</a></p> <p><a href="#">Additional Resource Provided by CCGI (Diary App)</a></p>
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<b>RETURN TO ACTIVITY/WORK/SCHOOL</b>	
	<b>TOOLS</b>
<b>Assessment</b>	
<ul style="list-style-type: none"> <li>• Healthcare professional:               <ul style="list-style-type: none"> <li>○ Identify medical restrictions: that could pose risk of sustaining injury or pose potential risk to others</li> <li>○ Identify limitations: due to physical, cognitive, emotional symptoms</li> <li>○ Identify and document symptom triggers</li> </ul> </li>   <li>• Employer:               <ul style="list-style-type: none"> <li>○ Review information on restrictions, limitations and symptom triggers</li> <li>○ Review information on job demands</li> <li>○ Identify opportunities for accommodations/work modification</li> </ul> </li> </ul>	
<b>Management</b>	
<ul style="list-style-type: none"> <li>• Avoid activities that could increase risk of sustaining another concussion during the recovery period, particularly in the first 7-10 days post-trauma.</li> <li>• Gradually resume normal activity based upon tolerance and conditional on not posing risk for further injury to self or others.</li> <li>• Advise that transient symptom exacerbations with increased activity are common.</li> <li>• Communicate restrictions/limitations to the patient's employer (with patient's consent) to facilitate appropriate accommodation. Examples of accommodations include:               <ul style="list-style-type: none"> <li>○ Assistance with commuting to and from work</li> <li>○ Flexible work hours (e.g., starting later or ending earlier)</li> <li>○ Gradual work re-entry (e.g., starting at 2 half days/week and expanding gradually)</li> </ul> </li> </ul>	<p><a href="#">Components of Vocational Evaluation following mTBI (App 12.1)</a></p>

<ul style="list-style-type: none"> <li>○ Additional time for task completion</li> <li>○ Quiet space available for worker to take breaks throughout the day</li> <li>○ Job change</li> <li>○ Environmental modifications (e.g., quieter work environment, enhanced level of supervision, decreased computer work, ability to work from home; only day shift hours)</li> <li>● Refer for interdisciplinary vocational assessment if patient has not successfully resumed pre-injury work.</li> <li>● If patient cannot return to pre-injury employment, consider alternative meaningful activities that promote community integration (e.g., educational activities, volunteer work).</li> <li>● Employer and worker:             <ul style="list-style-type: none"> <li>○ Formulate progressive RTW plan</li> </ul> </li> </ul>	
<p><b>Return to post-secondary school</b></p>	
<p><b>Within 24-48 hours post-injury:</b></p> <ul style="list-style-type: none"> <li>● <u>Asymptomatic:</u> <ul style="list-style-type: none"> <li>○ Attend school as tolerated, undergo tests/exams with accommodations if required (e.g., separate space, paced breaks, rooms where lights can be altered, additional time); monitor for potential symptoms.</li> </ul> </li> <li>● <u>Symptomatic:</u> <ul style="list-style-type: none"> <li>○ Refrain from attending school and from participating in academic and sports activities to decrease the risk for symptom exacerbation.</li> <li>○ Offer psychoeducation and modified at-home study tasks as tolerated.</li> <li>○ Students should be able to tolerate school and life responsibilities prior to participating in sports or activities that put them at risk.</li> </ul> </li> </ul> <p><b>After 24-48 hours post-injury:</b></p> <ul style="list-style-type: none"> <li>● <u>Asymptomatic:</u> <ul style="list-style-type: none"> <li>○ Return to academic/program related activities as tolerated.</li> </ul> </li> <li>● <u>Symptomatic:</u> <ul style="list-style-type: none"> <li>○ Refrain from attending academic and/or program-related activities for one full week and up to two full weeks if symptoms remain functionally debilitating.</li> <li>○ Connect with academic accessibility/disability services to request accommodations and receive additional support.</li> <li>○ Monitor for symptoms; provide support and education.</li> <li>○ Notify (with permission) accessibility/disability services about student's concussion; student may require time off, or accommodations and support for reintegration (potentially for the coming weeks or months).</li> </ul> </li> </ul>	<p>Psychoeducation definition: treatment designed to educate patients regarding expected symptoms, recovery, symptom management, or general self-care.</p> <p><a href="#">-Additional Resource Provided by CCGI – example of psychoeducational interventions (publication)</a></p> <p><a href="#">Package Template and Activity log (App 12.4)</a></p> <p><a href="#">Example Concussion Accessibility Intake Package for Student Services/Special Needs Department (App 12.2)</a></p> <p><a href="#">Acute Concussion Evaluation: Work version (app 12.5), School version (App 12.6)</a></p> <p><a href="#">Greater Accommodations for Students with</a></p>

	<a href="#">Persistent Symptoms following mTBI (App 12.3)</a>
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## SPORT-RELATED CONCUSSION

TOOLS	
<b>Assessment</b>	
<p>Any symptoms or signs of a concussion:</p> <ul style="list-style-type: none"> <li>• Evaluate onsite using standard emergency management principles</li> <li>• Rule out cervical spine injury</li> <li>• Sideline assessment (SCAT5) by healthcare profession (non-healthcare professionals use Concussion Recognition Tool 5)</li> </ul>	<p><a href="#">Sport Concussion Assessment Tool – 5<sup>th</sup> Edition (SCAT5) (App. 3.1)</a></p> <p><a href="#">Concussion Recognition Tool 5 (App. 3.2)</a></p> <p><a href="#">Neurologic and MSK exam (App 3.4)</a></p>
<b>Management</b>	
<ul style="list-style-type: none"> <li>• Player should not be left alone following the injury; monitor serially for increasing signs/symptoms of deterioration over the initial few hours.</li> <li>• Insufficient evidence for prescribing complete rest                             <ul style="list-style-type: none"> <li>○ Initial period of rest in the acute symptomatic period following injury (24-48 hours) may be beneficial.</li> <li>○ After a brief period of rest, a sensible approach involves the gradual return to activity/school (prior to contact sports) as tolerated</li> </ul> </li> </ul>	<p><a href="#">Buffalo Concussion Treadmill Test (BCTT) (App 3.3)</a></p> <p><a href="#">-Additional Resource Provided by CCGI (video)</a></p>
<b>Return-to-play and return-to-school</b>	
<ul style="list-style-type: none"> <li>• Player with suspected concussion should not be allowed to return-to-play on the day of injury.</li> <li>• Graduated return-to-play protocol.</li> </ul>	<p><a href="#">Graduated Return-to-Sport Strategy (Table 3.2)</a></p>

## REFERRALS AND COLLABORATION

TOOLS	
<p>Refer to medical care if:</p> <ul style="list-style-type: none"> <li>• <a href="#">Red flags</a> present</li> <li>• If patient's health condition/treatment goals are outside of the chiropractic scope of practice</li> </ul>	

<ul style="list-style-type: none"> <li>• If patient's health condition is not improving within expected time frames or worsening</li> <li>• There are other major comorbid conditions present (e.g., depression, PTSD)</li> </ul>	
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### Methods of guideline development

- Recommendations were developed by the project team's interpretation of the available evidence, taking into account the balance of benefits and harms. The team retained editorial independence.
- **To learn more:** <http://braininjuryguidelines.org/concussion/>

### CCGI Comments

- The CCGI recommends the use of this guideline, based on its quality and reporting as per the Appraisal of Guidelines Research and Evaluation (AGREE) II tool (available upon request).
- This summary is contextualized for use among chiropractors and other healthcare providers with similar scopes of practice, e.g., information about pharmacological management is not included (refer to the guideline for this information).
- Note that in the adult sports concussion literature (e.g., Berlin Consensus Statement, 2017), symptoms beyond 14 days are referred to as persistent.
- Chiropractors have the competency to diagnose and manage patients with concussion through providing a comprehensive assessment, ruling out serious pathology, providing patient education and reassurance, treating the symptoms associated with concussion and referring to the appropriate healthcare professional for acts that fall outside of their respective scope of practice.
- CCGI recommends the use of this guideline to chiropractors in Canada, based on the methodology of how this guideline was developed.
- CCGI is developing a clinical care pathway to aid in the evidence-based, patient-centered assessment and management of concussion.