

Key Recommendations



The following recommendations were highlighted by the guideline development group as the key clinical recommendations that should be prioritized for implementation. The grade of recommendation relates to the strength of the supporting evidence on which the recommendation is based. These key recommendations will also be highlighted throughout the full list of recommendations using the key symbol.

Section 1. Diagnosis/Assessment of Concussion/mTBI		
		GRADE
1.1	Concussion should be recognized and diagnosed as soon as possible to improve positive health outcomes for patients. Concussion can be recognized in the community by a non-medical professional, whereas diagnosis should be made by a physician/nurse practitioner. ^a	A
1.2	On presentation, the primary care provider should conduct a comprehensive review of every patient who has sustained concussion/mTBI (see Appendix 1.1). The assessment should include taking a history, examination and cognitive screen for post-concussive symptoms, and review of mental health (see Table 1.2). ^a	A
1.3	The need for early neuroimaging should be determined according to the <i>Canadian CT Head Rule</i> (Figure 1.1). For patients who fulfill these criteria, CT scanning is the most appropriate investigation for the exclusion of neurosurgically significant lesions, such as hemorrhage. Plain skull x-rays are not recommended. ^b	A
Section 2. Management of Concussion/mTBI		
2.1	Initial treatment of a patient with concussion/mTBI should be based upon a thorough evaluation of signs and symptoms, pre-injury history (e.g., prior concussion(s), premorbid conditions) and concurrent potential contributing factors (e.g., comorbid medical conditions, ADHD, medications, mental health difficulties, impact of associated concurrent injuries).	C
2.3	A patient with a first-time concussion/mTBI should be advised through early education, support and/ or assurance that a full recovery of their symptoms, including cognitive functioning, is typically seen within as early as a few days up to 1 to 3 months post-injury. ^b	A
2.4	For patients who have 1) comorbidities or identified health or risk factors (see Table 1.1) and are not on a trajectory of improvement within the first month, or 2) persistent symptoms greater than 4 weeks post-injury, it is recommended that these patients be referred for more comprehensive interdisciplinary evaluation to specialized concussion services/clinics (see Appendix 2.1). ^a	C
2.5	The primary care provider should routinely screen for the risk of depression and/or anxiety in the first few weeks after concussion/mTBI (see Appendices 8.1 and 8.2), which may be influenced by psychosocial factors and psychological responses to the injury. Patients who screen positive should be managed and referred to specialist services, if needed, since these conditions commonly complicate recovery. ^a	B
2.6	On presentation to healthcare professionals, patients and their support persons should be provided with education that includes verbal and printed information (see Appendices 1.3 and 1.4). This information should be provided at the initial assessment and ongoing as required. ^a Education should be tailored based on the patient's history and symptoms and include information on: <ol style="list-style-type: none"> Symptoms and expected outcomes Normalizing symptoms (education that current symptoms are expected and common after injury event) Reassurance about expected full recovery in the majority of patients within a few days, weeks or months Gradual return to activities as tolerated i.e., in a manner that does not result in a significant or prolonged exacerbation of symptoms and life roles Techniques to manage stress^c 	A (a-d) C (e)

a. Adapted from the Motor Accidents Authority NSW, *Guidelines for Mild Traumatic Brain Injury following a Closed Head Injury* (MAA, NSW, 2008).

b. Adapted from the NSW Ministry of Health. *Closed Head Injury in Adults - Initial Management* (PD2012_013)

c. Adapted from the VA/DoD *Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline* (VA/DoD, 2009).

Section 3. Sport-Related Concussion/mTBI		GRADE
3.1	<p>Patients with sport-related concussion may develop symptoms acutely or sub-acutely. If any one of the following signs/symptoms are observed/reported at any point following a blow to the head, or elsewhere on the body leading to impulsive forces transmitted to the head, concussion should be suspected and appropriate management instituted.</p> <ol style="list-style-type: none"> 1. Any period of loss of or decreased level of consciousness less than 30 min 2. Any lack of memory for events immediately before or after the injury (post-traumatic amnesia) less than 24 hours 3. Any alteration in mental state at the time of the injury (e.g., confusion, disorientation, slowed thinking, alteration of consciousness/mental state) 4. Physical symptoms (e.g., vestibular, headache, weakness, loss of balance, change in vision, auditory sensitivity, dizziness) <p>Note: No evidence of intracranial lesion on standard imaging (if present, it is suggestive of more severe brain injury)</p> <p>Refer to Table A for a comprehensive list of signs for possible concussion.^a</p>	C
3.2	<p>When a player shows any symptoms or signs of a Sport-Related Concussion (SRC):</p> <ol style="list-style-type: none"> a. The player should be medically evaluated by a physician or other licensed healthcare professional onsite using standard emergency management principles and particular attention should be given to excluding a cervical spine injury. b. The appropriate disposition of the player must be determined by the treating healthcare professional in a timely manner. If no healthcare professional is available, the player should be safely removed from practice or play and urgent referral to a physician arranged. c. Once the first-aid issues are addressed, an assessment of the concussive injury should be made by a healthcare professional using a sideline assessment tool (e.g., <i>SCAT5 Appendix 3.2</i>). Non-medical professionals should use the <i>Sport Concussion Recognition Tool (Appendix 3.3)</i>. d. The player should not be left alone following the injury, and serial monitoring for increasing symptoms or signs of deterioration is essential over the initial few hours after injury with the aim of detecting an evolving injury. e. A player with suspected SRC should not be allowed to return-to-play on the day of injury.^a 	A (a) C (b-e)
3.4	<p>There is currently insufficient evidence that prescribing complete rest may ease discomfort during the acute recovery period by mitigating post-concussion symptoms and/or that rest may promote recovery by minimizing brain energy demands following concussion.</p> <ul style="list-style-type: none"> • An initial period of rest in the acute symptomatic period following injury (24-48 hours) may be of benefit. • After a brief period of rest, a sensible approach involves the gradual return to school and social activities (prior to contact sports) as tolerated (i.e., in a manner that does not result in a significant or prolonged exacerbation of symptoms. See Table 12.2).^a 	A
Section 4. General Recommendations Regarding Diagnosis/ Assessment of Persistent Symptoms		
4.5	<p>After a brief period of rest during the acute phase (24–48 hours) after injury, patients can be encouraged to become gradually and progressively more active as tolerated (i.e., activity level should not bring on or worsen their symptoms).^a</p>	A
Section 5. General Recommendations Regarding Management of Persistent Symptoms		
5.2	<p>Persistent symptoms after concussion/mTBI should lead primary care providers to consider that many factors may contribute to the persistence of post-concussive symptoms (see Table 1.1). All relevant factors (medical, cognitive, psychological and psychosocial) should be examined with regards to how they contribute to the patient's symptom presentation and considered in the management strategies.^b</p>	A

- a. Adapted from McCrory P, Meeuwisse WH, Aubry M, et al. Consensus statement on concussion in sport: the 5th International Conference on Concussion in Sport held in Berlin, October 2016. *Br J Sports Med* 2017;0:1–10. doi:10.1136/bjsports-2017-097699. Note that this definition was adapted for the purposes of this guideline. For the definition of Concussion as defined by the 2017 Concussion in Sport please visit [HERE](#).
- b. Adapted from the Motor Accidents Authority NSW, *Guidelines for Mild Traumatic Brain Injury following a Closed Head Injury (MAA, NSW, 2008)*.

5.3	Persons with concussion/mTBI and identified factors typically associated with persistent symptoms (see Table 1.1) should be considered for early referral to an interdisciplinary treatment clinic including a physician with expertise in concussion/mTBI where available or interdisciplinary formal network of providers (see Appendix 2.1) capable of managing post-concussive symptoms because these factors have been associated with poorer outcomes.	B
Section 7. Persistent Sleep- Wake Disturbances		
7.5	It is recommended to treat sleep-wake disturbances in patients with concussion/mTBI. Treatment of sleep disorders may help with: <ul style="list-style-type: none"> • Mood • Anxiety • Pain • Fatigue • Cognitive Problems 	B
Section 8. Persistent Mental Health Disorders		
8.1	In assessing common post-concussive mental health symptoms, determine whether the symptoms meet criteria for the presence of common mental health disorders, which include but are not limited to: <ul style="list-style-type: none"> • Depressive disorders (see Appendix 8.1) • Anxiety disorders (see Appendix 8.2) including Post-traumatic Stress Disorder (PTSD) (see Appendices 8.3 and 8.4) • Behavioral changes (e.g. apathy, lability, impulsivity, aggression, irritability) • Emotional regulation issues • Substance use disorders (see Appendix 8.5) • Somatoform disorders Elements of the assessment should include taking a comprehensive history (including discussion with support persons), structured clinical interview, use of self-report questionnaires, and behavioral observation.	B
Section 9. Persistent Cognitive Difficulties		
9.1	A patient sustaining a concussion should be evaluated for the presence of cognitive difficulties, and consideration taken to the impact of such difficulties on functional areas such as performance at work or school and completing tasks within the home and community, etc. This can be done through a focused clinical interview regarding symptoms and administration of a validated post-concussion questionnaire [e.g., <i>Rivermead</i> (Appendix 1.5) or <i>SCAT5</i> (Appendix 3.1)] for the purpose of assessing and tracking symptoms.	B
9.4	Patients who have cognitive symptoms that are not resolving and continue to interfere in daily functioning (e.g., school or work) beyond 4 weeks should be considered for referral for specialized cognitive assessment (e.g., neuropsychological assessment). The evaluation may assist in clarifying appropriate treatment options based on individual patient characteristics and conditions.	A
Section 11. Persistent Fatigue		
11.4	If identified as a significant symptom, some key considerations that may aid in the management of persistent fatigue can include: <ul style="list-style-type: none"> • Aiming for a gradual increase in activity levels (see Appendix 11.4) that will parallel improvement in energy levels, including exercise below symptom threshold. • Reinforce strategies of cognitive and physical activity pacing (see Appendix 2.6) and fragmentation across the day to help patients achieve more without exceeding tolerance levels. • Encouraging good sleep hygiene (especially regularity of sleep-wake schedules and avoidance of stimulants and alcohol), and proper relaxation times. • Using a notebook or a diary to plan meaningful goals, record activity achievement and identify patterns of fatigue. • Acknowledging that fatigue can be exacerbated by low mood or stress. Provide patients with a pamphlet containing advice on coping strategies for fatigue (see Appendix 11.3).	C

a. Adapted from the VA/DoD *Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline* (VA/DoD, 2009).

Section 12. Return-to-Activity/Work/School		
12.1	Immediately following any concussion/mTBI, patients should be provided with recommendations to avoid activities that would increase their risk for sustaining another concussion during the recovery period, particularly in the first 7-10 days. ^a	C
Section 12. Return-to-Activity/Work/School		
		GRADE
12.3	Patients with concussion/mTBI should be encouraged to gradually resume normal activity (activities of daily living, work, physical, school, duty, leisure) based upon their tolerance as long as the activity is not at specific risk for concussion. Patients should be preemptively cautioned that transient symptom exacerbations with increased activity are common. If symptoms increase in severity then a monitored slower progressive return to normal activity as tolerated should be continued. ^a	A
12.8	Patients who have not successfully resumed pre-injury work duties following injury should be referred for an interdisciplinary vocational evaluation that includes an assessment of (see Appendix 12.1): <ul style="list-style-type: none"> • Cognitive and psychosocial functioning • Occupational and job demands • Work environment • Environmental supports • Facilitators and barriers to successful work/return to work 	B
12.10	<p><u>Within 24-48 hours post-injury:</u> If asymptomatic: The student can attend school as tolerated but should not undergo evaluations (tests/exams) or should write with accommodations (such as separate space, paced breaks, rooms where lights can be altered, additional time) and should be monitored for potential symptoms. If symptomatic: The student should refrain from attending school and from participating in all academic and sports activities, including apprenticeship, practicum, and shop related activities, in order to decrease the risk for symptom exacerbation. In addition, the student should be offered psychoeducation and modified at-home study tasks as tolerated. Students should be able to tolerate school and life responsibilities prior to participating in sports or activities that put them at risk.</p> <p><u>After 24-48 hours post-injury: (see Appendix 12.4)</u> If asymptomatic: The student may return to academic/program related activities as tolerated as long as they remain asymptomatic. If symptomatic: the student should refrain from attending academic and/or program-related activities for one full week and up to two full weeks if symptoms remain functionally debilitating.</p> <ul style="list-style-type: none"> • Connect with academic accessibility/disability services to request accommodations and receive additional support. • Be monitored for the emergence of potential symptoms and be provided with support and education. • The healthcare professional (with permission) should ensure that accessibility/disability services are notified that a concussion/mTBI has occurred (see Appendix 12.2) and that the student will require time off, and may require accommodations and support for reintegration. • Reintegration should occur progressively and specific accommodations should match the student's residual symptoms. <p><u>1-2 weeks post-injury: (see Appendix 12.5)</u> If symptoms are still functionally debilitating at 1 week post-injury the student should refrain from attending academic- and/or program-related activities. The healthcare professional should again notify accessibility/disability services that the student is still symptomatic and accommodations and support for reintegration will be required.</p> <p><u>After 2 weeks post-injury:</u> The student should start attending school (non-physical activities) very gradually as tolerated and with accommodations, even if he/she is still experiencing symptoms. A healthcare professional with experience in concussion/mTBI rehabilitation should provide guidance to the student and educators. Accessibility/disability services should be notified again so teachers/professors can subsequently monitor progress with the student and adjust the return-to-school plan, as necessary.</p>	C

a. Adapted from the VA/DoD Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline (VA/DoD, 2009).