

# 5

## General Recommendations Regarding Management of Persistent Symptoms

Special Contributors:  
Deanna Quon & Mark Bayley

Consistent with general expectations of both patients and healthcare professionals, symptoms following mTBI are anticipated to resolve in a timely fashion in the majority of cases; evidence is emerging that some people (15% or greater) continue to have persistent symptoms.<sup>1-3</sup> There is wide variation in how people recover after concussion/mTBI<sup>4</sup> even when experiencing similar injuries.<sup>2</sup> This guideline has been developed to assist in managing those individuals who continue to have persistent symptoms or delayed recovery following concussion/mTBI.

While there are few treatments for the early stage of concussion recovery, it is notable that providing psychoeducational intervention and supportive reassurance about concussive symptoms, expectations of recovery and strategies for symptom reduction are highly effective for reducing persisting symptoms.<sup>5-7</sup> Furthermore there is evidence that complete rest exceeding 48 to 72 hours may slow recovery. Primary care providers must carefully monitor for patients who do not follow the anticipated pattern of recovery. For those who have had complete symptom resolution, no intervention apart from the provision of injury prevention strategies is required. However, for those with persistent symptoms or decline in function, emphasis needs to be placed on regular monitoring by healthcare professionals and identification of potentially treatable symptoms.

Obtaining a history of medical problems, performing a careful physical examination, an extensive review of concussion symptoms, and considering the response to exertion testing is essential when developing the differential diagnosis of persistent post-concussion symptoms.<sup>8,9</sup> Through this process, the primary care provider may be able to link symptoms of persistent post-concussion symptoms to one or more definable post-concussion disorders.<sup>10</sup> An interdisciplinary process is often helpful and referrals to appropriate specialists should be considered if available.<sup>9</sup>

Development of complications post mTBI, such as depression, can also occur and further alter the course or pattern of recovery. In turn, efforts to update the patient's family on the chosen intervention strategies should be considered, as their support is often a key component to maximizing patient independence and psychosocial adjustment. It is also important to approach the patient's tolerance towards activity with vigilance, as going beyond his or her threshold may result in the worsening of symptoms. Periodic re-evaluation of the patient for worsening of symptoms or presence of new symptoms/problems following mTBI is important for those with a more chronic course of recovery.

While patients with persisting symptoms following mTBI are sometimes portrayed as making claims solely for secondary gain (i.e., disability benefits or litigation), it should be noted that in fact many factors can affect symptom expression and accentuation, including levels of emotional distress, fatigue, and pain, as well as pre- and post-injury coping abilities.<sup>11,12</sup> Accordingly, suspected symptom exaggeration or perceived compensation seeking should only reinforce the need for a comprehensive assessment and evidence-based treatment with evaluation of outcomes.

Persistent symptoms describe a constellation of nonspecific symptoms that may be linked to other conditions such as depression, pain, headache, sleep disturbance, vertigo, irritability, anxiety, difficulty with concentration and chronic fatigue, which do not necessarily reflect ongoing physiological brain injury.<sup>1,13-15</sup> Symptoms associated with persistent post-concussion symptoms are also common in populations who have not sustained a mTBI.<sup>15</sup> Nonetheless, patients are often functionally affected by these symptoms, and therefore they should be addressed. This guideline has been designed to provide an approach that focuses on optimizing management of individual symptoms to enhance function following mTBI. By addressing symptoms in a coordinated manner, improvement in outcome can be achieved. See [Algorithm 5.1](#), which outlines the key steps to management of persistent symptoms following mTBI.

GENERAL RECOMMENDATIONS REGARDING MANAGEMENT OF PERSISTENT SYMPTOMS		GRADE
5.1	<i>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.<sup>a*</sup></i>	<b>A</b>
5.2	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 <a href="#">Table 1.1</a> ). 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. <sup>a</sup>	<b>A</b>
5.3	Persons with concussion/mTBI and identified factors typically associated with persistent symptoms (see <a href="#">Table 1.1</a> ) 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 <a href="#">Appendix 2.1</a> ) capable of managing post-concussive symptoms because these factors have been associated with poorer outcomes.	<b>B</b>
5.4	If necessary for support, communication with healthcare professionals or understanding information provided, a support person accompanying the patient with post-concussive symptoms to assessment and treatment sessions is recommended. <sup>b</sup>	<b>C</b>
5.5	<i>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).<sup>c**</sup></i>	<b>C</b>
5.6	New onset pain and concussive injuries are often comorbid. Comprehensive evaluation and management of pain is important as it can be a factor in maintaining persistent symptoms or can overlap/exacerbate concussion/mTBI symptoms.	<b>C</b>
5.7	<i>On presentation to healthcare professionals, patients and their support person should be provided with educational material that includes a verbal review and written information (see Appendices <a href="#">1.3</a> and <a href="#">1.4</a>). This information should be provided at the initial assessment and ongoing as required. Education should be tailored based on the patient's history and symptoms and include information on:</i> <i>a. Symptoms and expected outcomes</i> <i>b. Normalizing symptoms (education that current symptoms are expected and common after injury event)</i> <i>c. Reassurance about expected positive recovery</i> <i>d. Gradual return to activities and life roles</i> <i>e. Techniques to manage stress<sup>***</sup></i>	<b>A (a-d)</b>  <b>C (e)</b>
*NEW* 5.8	It is not recommended to use Hyperbaric Oxygen to treat symptoms post- concussion.	<b>A</b>

\* NOT AN ORIGINAL RECOMMENDATION - REPEAT OF 2.3

c\*\* NOT AN ORIGINAL RECOMMENDATION - REPEAT OF 4.5

\*\*\* NOT AN ORIGINAL RECOMMENDATION - REPEAT OF 2.6

- 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 VA/DoD *Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline* (VA/DoD, 2009).  
 c. Adapted from McCrory P, Meeuwisse W, Dvořák J, et al. *Consensus statement on concussion in sport. Br J Sports Med* 2017;51:838-847

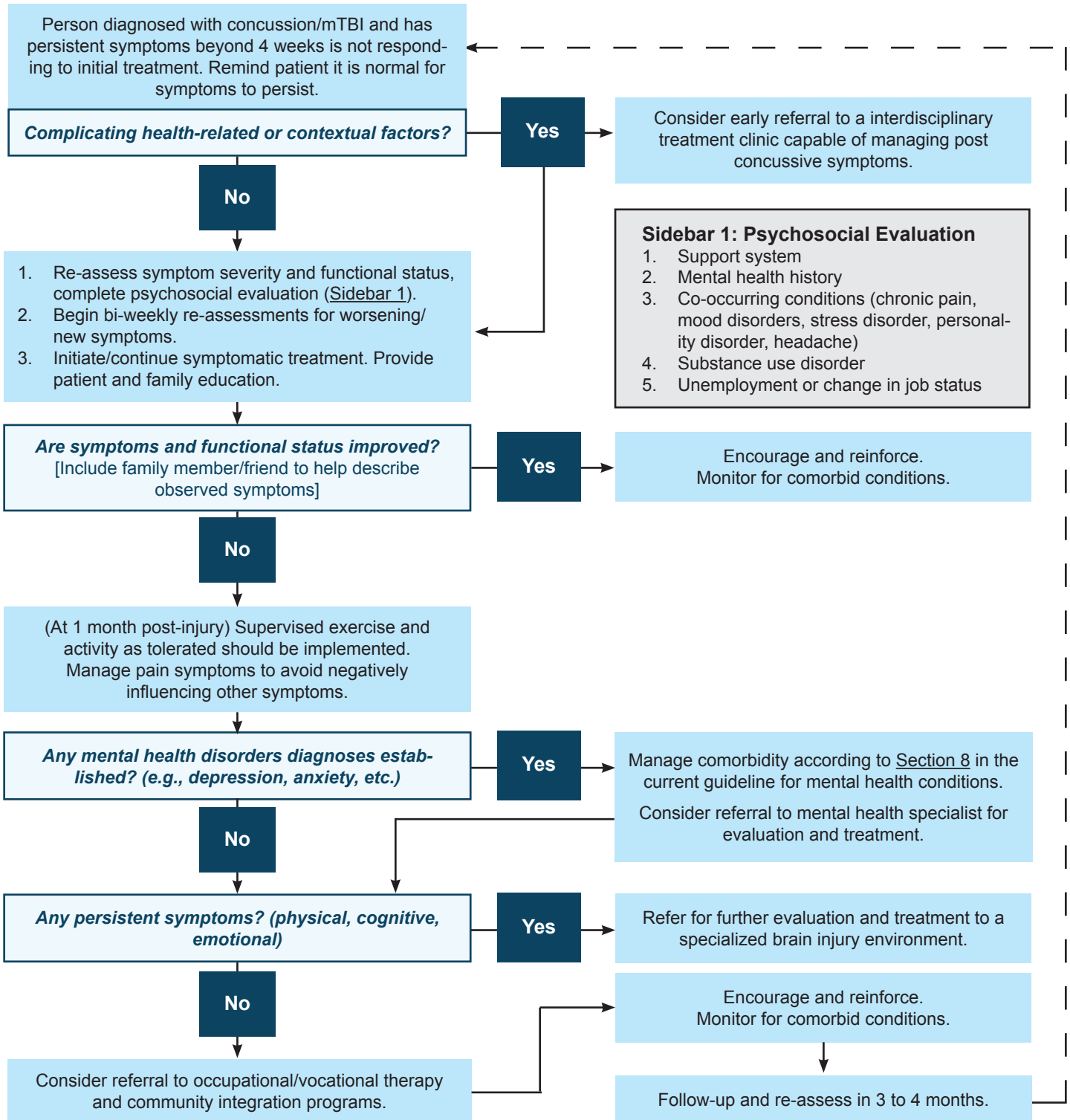
RESOURCES	
<b>APPENDICES</b>	
1 Brain Injury Advice Card (Long Version)	Appendix 1.3
2 Brain Injury Advice Cards (Short Versions)	Appendix 1.4
3 Specialized Concussion Clinics/Centres in Ontario	Appendix 2.1
<b>ALGORITHMS</b>	
1 Management of Persistent Symptoms following mTBI	Algorithm 5.1
<b>TABLES</b>	
1 Risk Factors Influencing Recovery Post mTBI	Table 1.1

### References

- Leddy JJ, Baker JG, Willer B. Active Rehabilitation of Concussion and Post-concussion Syndrome. *Phys Med Rehabil Clin N Am.* 2016;27(2):437-454.
- Theadom A, Parag V, Dowell T, et al. Persistent problems 1 year after mild traumatic brain injury: a longitudinal population study in New Zealand. *Br J Gen Pract.* 2016;66(642):e16-23.
- Cancelliere C, Kristman VL, Cassidy JD, et al. Systematic review of return to work after mild traumatic brain injury: results of the International Collaboration on Mild Traumatic Brain Injury Prognosis. *Arch Phys Med Rehabil.* 2014;95(3 Suppl):S201-209.
- Lingsma HF, Roozenbeek B, Steyerberg EW, Murray GD, Maas AI. Early prognosis in traumatic brain injury: from prophecies to predictions. *Lancet Neurol.* 2010;9(5):543-554.
- Brunger H, Ogden J, Malia K, Eldred C, Terblanche R, Mistlin A. Adjusting to persistent post-concussive symptoms following mild traumatic brain injury and subsequent psycho-educational intervention: a qualitative analysis in military personnel. *Brain Inj.* 2014;28(1):71-80.
- Cooper DB, Bunner AE, Kennedy JE, et al. Treatment of persistent post-concussive symptoms after mild traumatic brain injury: a systematic review of cognitive rehabilitation and behavioral health interventions in military service members and veterans. *Brain Imaging Behav.* 2015;9(3):403-420.
- Broshek DK, De Marco AP, Freeman JR. A review of post-concussion syndrome and psychological factors associated with concussion. *Brain Inj.* 2015;29(2):228-237.
- Leddy JJ, Willer B. Use of graded exercise testing in concussion and return-to-activity management. *Curr Sports Med Rep.* 2013;12(6):370-376.
- Bramley H, Hong J, Zacko C, Royer C, Silvis M. Mild Traumatic Brain Injury and Post-concussion Syndrome: Treatment and Related Sequela for Persistent Symptomatic Disease. *Sports Med Arthrosc.* 2016;24(3):123-129.
- Leddy JJ, Baker JG, Merchant A, et al. Brain or strain? Symptoms alone do not distinguish physiologic concussion from cervical/vestibular injury. *Clin J Sport Med.* 2015;25(3):237-242.
- Martelli M, Nicholson K, Zasler N, Bender M. Assessment of Response Bias in Clinical and Forensic Evaluations of Impairment Following Brain Injury. In: *Brain Injury Medicine*; 2007:1183-1203.
- Stulemeijer M, Andriessen TM, Brauer JM, Vos PE, Van Der Werf S. Cognitive performance after mild traumatic brain injury: the impact of poor effort on test results and its relation to distress, personality and litigation. *Brain Inj.* 2007;21(3):309-318.
- Leddy JJ, Sandhu H, Sodhi V, Baker JG, Willer B. Rehabilitation of Concussion and Post-concussion Syndrome. *Sports Health.* 2012;4(2):147-154.
- McCrary P, Meeuwisse W, Dvořák J, et al. Consensus statement on concussion in sport. *Br J Sports Med.* 2017; 51:838-847
- Iverson GL, Lange RT. Examination of "postconcussion-like" symptoms in a healthy sample. *Appl Neuropsychol.* 2003;10(3):137-144.

# Algorithm 5.1

## Management of Persistent Symptoms Following concussion/mTBI\*



For a narrative description and guideline recommendations related to this algorithm, please refer to **Section 5**.

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