

Guidelines for Concussion/Mild Traumatic Brain Injury & Persistent Symptoms: Second Edition

Sources for the mTBI Guideline Recommendations

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.1	Concussion/mTBI in the setting of closed head injury should be diagnosed as soon as possible as early recognition is associated with positive health outcomes for patients.	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

Borg J, Holm L, Cassidy JD, Peloso PM, Carroll LJ, von Holst H, Ericson K. Diagnostic procedures in mild traumatic brain injury: results of the WHO collaborating centre task force on mild traumatic brain injury. *Journal of Rehabilitation Medicine*. 2004;43(suppl):61-75.

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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.2	On presentation, the primary care provider should conduct a comprehensive review of every patient who has sustained mTBI (see Appendix 1.1). The assessment should include taking a history, examination, cognitive screen, post concussive symptom assessment and review of mental health (see Table 1.2).	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

Borg J, Holm L, Cassidy JD, Peloso PM, Carroll LJ, von Holst H, Ericson K. Diagnostic procedures in mild traumatic brain injury: results of the WHO collaborating centre task force on mild traumatic brain injury. *Journal of Rehabilitation Medicine*. 2004;43(suppl):61-75.

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Iverson GL, Lange RT, Franzen MD. Effects of mild traumatic brain injury cannot be differentiated from substance abuse. *Brain Injury*. 2005;19(1):11-18.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.3	The need for early neuroimaging should be determined according to the Canadian CT Head Rule (see 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.	A	New South Wales Ministry of Health, Adult Trauma Clinical Practice Guidelines: Management of Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

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Jagoda AS, Bazarian JJ, Bruns JJ, Jr., Cantrill SV, Gean AD, Howard PK, et al. Clinical policy: neuroimaging and decision making in adult mild traumatic brain injury in the acute setting. *Annals of Emergency Medicine* 2008;52(6):714-748.

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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.4	Standardized measurement of post traumatic amnesia (PTA) should be routinely performed to assist with the monitoring, diagnosis, early management and prognosis of patients who have experienced mTBI (see Appendix 1.2).	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

Borg J, Holm L, Cassidy JD, Peloso PM, Carroll LJ, von Holst H, Ericson K. Diagnostic procedures in mild traumatic brain injury: results of the WHO collaborating centre task force on mild traumatic brain injury. *Journal of Rehabilitation Medicine*. 2004;43(suppl):61-75.

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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.5	<p>Patients with mTBI can be safely discharged for home observation after an initial period of in-hospital observation if they meet the following clinical criteria:</p> <ul style="list-style-type: none"> • Normal mental status (alertness / behaviour / cognition) with clinically improving post concussive symptoms after observation until at least four hours post injury. • No clinical risk factors indicating the need for CT scanning or normal CT scan result if performed due to presence of risk factors. • No clinical indicators for prolonged hospital observation where clinical judgment is required such as: <ul style="list-style-type: none"> • clinical deterioration • persistent abnormal GCS or focal neurological deficit • persistent abnormal mental status • persistent clinical symptoms (vomiting/ severe headache) • presence of known coagulopathy • persistent drug or alcohol intoxication • presence of multi-system injuries • presence of concurrent medical problems • age >65 	A	New South Wales Ministry of Health, Adult Trauma Clinical Practice Guidelines: Management of Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

- Borg J, Holm L, Cassidy JD, Peloso PM, Carroll LJ, von Holst H, Ericson K. Diagnostic procedures in mild traumatic brain injury: results of the WHO collaborating centre task force on mild traumatic brain injury. *Journal of Rehabilitation Medicine*. 2004;43(suppl):61-75.
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.6	<p>Patients with mTBI can be safely discharged for home observation after an initial period of observation if they meet the following <u>discharge advice criteria</u>:</p> <ul style="list-style-type: none"> Discharge summary prepared for primary care (or family) doctor. Written and verbal brain injury advice (Appendix 1.3 and 1.4) given to patient (and nominated responsible person) covering: <ul style="list-style-type: none"> Symptoms and signs of acute deterioration and when to seek urgent follow-up Lifestyle advice to assist recovery Typical post concussive symptoms and reassurance about anticipated recovery Reasons for seeking routine follow up. 	C	<p>New South Wales Ministry of Health, Adult Trauma Clinical Practice Guidelines: Management of Closed Head Injury</p> <p>Consensus</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.7	<p>If the patient re-attends an emergency department/urgent care service with symptoms related to the initial injury, the following should be conducted:</p> <ul style="list-style-type: none"> Full re-evaluation, including an assessment for ongoing post-traumatic amnesia (PTA) CT scan, if indicated Emphasis and encouragement to the patients to attend their family physician for follow-up after discharge. 	C	<p>Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury</p> <p>Consensus</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
1.8	<p>Clinicians should assess, monitor and document persisting somatic, cognitive and emotional/behavioural symptoms following mTBI using a standardized assessment scale (Appendix 1.8).</p>	C	<p>Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury</p> <p>Consensus</p>	TBI

Primary Sources Cited in Pre-existing Guidelines	
Bryant RA. Disentangling mild traumatic brain injury and stress reactions. <i>The New England Journal of Medicine</i> . 2008;358(5):525-527.	
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.1	Initial treatment of a patient with concussion should be based upon a thorough evaluation of signs and symptoms, pre-injury history (e.g., premorbid conditions) and concurrent potential contributing factors (e.g., comorbid medical conditions, medications, mental health difficulties, impact of associated concurrent injuries).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.2	Persons who complain about somatic, cognitive or behavioral difficulties after mTBI should be assessed and treated symptomatically even if it has been a prolonged time after injury.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.3	The patient should be advised that a full recovery of symptoms is seen in the majority of cases.	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI
Primary Sources Cited in Pre-existing Guidelines				
Chambers J, Cohen S, Hemminger L, Prall J, Nichols J. Mild traumatic brain injuries in low risk trauma patients. <i>Journal of Trauma</i> . 1996;41(6):976-980.				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.4	A patient experiencing reduced cognitive functioning in the first few days following injury, with education and support, should be expected, in the majority of cases, to have these symptoms resolve and pre-injury cognitive functioning return within days, up to three months.	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.5	For patients who have 1) co-morbidities or identified health or risk factors (Table 1.1) and do not improve by one month, or 2) persistent symptoms at 3 months post-injury, it is recommended that these patients be referred for more comprehensive evaluation to a specialized brain injury environment (see Appendix 2.1).	C	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.6	The primary care provider should consider the risk of depression or other mental health disorders in patients who have experienced mTBI, which may be influenced by psychosocial factors and psychological responses to the injury.	B	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

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Rogers JM, Read CA. Psychiatric comorbidity following traumatic brain injury. *Brain Injury*. 2007;21(13- 14):1321-1333.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.7	Multiple concussions should be considered a flag or signal that warrants a more intensive management strategy.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.8	On presentation to health care providers, education about symptoms, including an advice card (Appendix 1.3 and 1.4) provided in writing and explained verbally, and reassurance should be provided to all patients and family members. Education should ideally be delivered at the time of initial assessment or minimally within one week of injury/first assessment.	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury New Zealand Guidelines Group, Traumatic Brain Injury: Diagnosis, Acute Management and Rehabilitation	TBI
Primary Sources Cited in Pre-existing Guidelines				
British Columbia, Mild Traumatic Brain Injury: review of the literature and a look at the WCB of BC data, D.C.M. WCB Evidence Based Practice Group, Editor. 2003, Compensation and Rehabilitation Services Division.				
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Turner-Stokes L, Disler PB, Nair A, Wade DT. Multi-disciplinary rehabilitation for acquired brain injury in adults of working age. 2005, The Cochrane Database of Systematic Reviews.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.9	Individualized telephone or in-person follow-up with education on symptom management and encouragement to resume everyday activities should be provided over the 12 weeks after injury.	A	Bell KR, Hoffman JM, et al. The effect of telephone counselling on reducing posttraumatic symptoms after mild traumatic brain injury: A randomised trial. <i>Journal of Neurology, Neurosurgery and Psychiatry</i> . 2008;79:1275-1281.	TBI
Primary Sources Cited in Pre-existing Guidelines				
N/A				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
2.10	<p>Education should be provided in printed material (Appendix 1.3 and 1.4) combined with verbal review and consist of:</p> <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 positive recovery. Gradual return to activities and life roles. Techniques to manage stress. 	<p>A (a,b,c,d)</p> <p>C (e)</p>	<p>Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury</p> <p>Bell KR, Hoffman JM, et al. The effect of telephone counselling on reducing posttraumatic symptoms after mild traumatic brain injury: A randomised trial. Journal of Neurology, Neurosurgery and Psychiatry. 2008;79:1275–1281.</p>	TBI

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Mittenberg W, Tremont G, Zielinski RE, Fichera S, Rayls KR. Cognitive-behavioral prevention of postconcussion syndrome. *Archives of Clinical Neuropsychology*. 1996;11(2):139-145.

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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
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"> symptoms: somatic (e.g. headache), cognitive (e.g. feeling like in a fog) and/or emotional symptoms (e.g. lability) physical signs (e.g. loss of consciousness, amnesia) behavioral changes (e.g. irritability) cognitive impairment (e.g. slowed reaction times) sleep disturbance (e.g. insomnia). <p>Refer to Table A for a comprehensive list of signs for possible concussion.</p>	C	<p>Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
3.2	<p>When a player shows any features of a concussion:</p> <ul style="list-style-type: none"> The player should be medically evaluated by a physician or other licensed healthcare provider onsite using standard emergency management principles and particular attention should be given to excluding a cervical spine injury. The appropriate disposition of the player must be determined by the treating healthcare provider in a timely manner. If no healthcare provider is available, the player should be safely removed from practice or play and urgent referral to a physician arranged. Once the first aid issues are addressed, then an assessment of the concussive injury should be made using the SCAT3 (Appendix 3.1 and 3.2) or other similar tool. The player should not be left alone following the injury and serial monitoring for deterioration is essential over the initial few hours following injury. A player with diagnosed or suspected concussion should not be allowed to return to play or practice on the day of injury. "If in doubt, sit them out". 	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
3.3	<p>The cornerstone of concussion management is physical and cognitive rest until the acute symptoms resolve and then a graded program of exertion prior to medical clearance and return to play.</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. A sensible approach involves the gradual return to school and social activities (prior to contact sports) in a manner that does not result in a significant exacerbation of symptoms. 	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
3.4	A range of 'modifying' factors may influence the investigation and management of concussion and, in some cases, may predict the potential for prolonged or persistent symptoms. These modifiers would be important to consider in a detailed concussion history and should be managed in a multidisciplinary manner by health care providers with experience in sports-related concussion (see Table 3.1).	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
3.5	Physicians or other licensed health care providers are encouraged to evaluate the concussed athlete for mood symptoms such as depression and anxiety, as these symptoms are common in all forms of traumatic brain injury.	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
Bloom G, Horton A, McCrory P, et al. Sport psychology and concussion: new impacts to explore. <i>British Journal of Sports Medicine</i> . 2004;38:519–521.				
Weiss MR, Gill DL. What goes around comes around: re-emerging themes in sport and exercise psychology. <i>Research Quarterly for Exercise & Sport</i> . 2005;76(2 suppl):S71–S87.				
Johnston K, Bloom G, Ramsay J, et al. Current concepts in concussion rehabilitation. <i>Current Sports Medicine Reports</i> . 2004;3:316–323.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
3.6	Return to play (RTP) protocol following a concussion follows a stepwise process as outlined in Table 3.2. With this stepwise progression, the athlete should continue to proceed to the next level if asymptomatic at the current level. Generally, each step should take 24 hours so that an athlete would take approximately 1 week to proceed through the full rehabilitation protocol once they are asymptomatic at rest and with provocative exercise. If any post concussion symptoms occur while in the stepwise program, then the patient should drop back to the previous asymptomatic level and try to progress again after a further 24-hour period of rest has passed.	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
3.7	An important consideration in return to play is that athletes who have experienced concussion should not only be symptom free, but also should not be taking any pharmacological agents/medications that may mask or modify the symptoms of concussion.	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
4.1	<i>Clinicians should assess, monitor and document persisting somatic, cognitive and emotional/behavioural symptoms following mTBI using a standardized assessment scale (Appendix 1.5). [NOT AN ORIGINAL RECOMMENDATION - SAME AS 1.8]</i>	C	<i>Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury</i>	TBI
Primary Sources Cited in Pre-existing Guidelines				
See 1.8 in current appendix.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
4.2	The assessment and management of an individual with persistent mTBI-related symptoms should be directed toward the specific symptoms regardless of their etiology or elapsed time from injury.	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
4.3	The assessment should include a review of currently prescribed medications, over-the-counter medications/supplements, and substance use, including alcohol.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
4.4	Persistent symptoms following mTBI can be nonspecific. Therefore, careful and thorough differential diagnoses should be considered as similar symptoms are common in chronic pain, depression, anxiety disorders, and other medical and psychiatric disorders (see Table 4.1 and Appendix 4.1).	C	Consensus	-

Primary Sources Cited in Pre-existing Guidelines			
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mTBI Guideline	Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.1	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines			
Bazarian JJ, Zelman FP, Mookerjee S, Stigbrand T. Serum s-100B and cleaved-tau are poor predictors of longterm outcome after mild traumatic brain injury. <i>Brain Injury</i> . 2006;20(7):759-765.			
Chambers J, Cohen S, Hemminger L, Prall J, Nichols J. Mild traumatic brain injuries in low risk trauma patients. <i>Journal of Trauma</i> . 1996;41(6):976-980.			
Eyres S, Carey A, Gilworth G, Neumann V, Tennant A. Construct validity and reliability of the Rivermead Post Concussion Symptoms Questionnaire. <i>Clinical Rehabilitation</i> . 2005;19:878-887.			
Ingebrigtsen T, Waterloo K, Marup-Jensen S, Attner E, Romner B. Quantification of post concussion symptoms three months after minor head injury in 100 consecutive patients. <i>Journal of Neurology</i> . 1998;245(9):609-612.			
Lundin A, De Bousard C, Edman G, Borg J. Symptoms and disability until three months after mild TBI. <i>Brain Injury</i> . 2006;20(8):799-806.			
Ponsford J, Willmott C, Rothwell A, Cameron P, Kelly AM, Nelms R, Curran C, Ng K. Factors influencing outcome following mild traumatic brain injury in adults. <i>Journal of International Neuropsychological Society</i> . 2000;6(5):568-579.			
Savola O, Hillbom M. Early predictors of post-concussion symptoms in patients with mild head injury. <i>European Journal of Neurology</i> . 2003;10:175-181.			
Sheedy J, Geffen G, Donnelly J, Faux S. Emergency department assessment of mild traumatic brain injury and prediction of post-concussion symptoms at one month post injury. <i>Journal of Clinical and Experimental Neuropsychology</i> . 2006;28:775-772.			

mTBI Guideline	Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.2	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines			
See 2.3 in current appendix.			

mTBI Guideline	Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.3	A	Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury	TBI

Primary Sources Cited in Pre-existing Guidelines			
Bryant RA. Disentangling mild traumatic brain injury and stress reactions. <i>The New England Journal of Medicine</i> . 2008;358(5):525-527.			
Carroll LJ, Cassidy JD, Peloso P, Borg J, von Holst H, Holm L, Paniak C, Pepin M. Prognosis for mild traumatic brain injury: results of the WHO collaborating centre task force on mild traumatic brain injury. <i>Journal of Rehabilitation Medicine</i> . 2004;43(suppl):84-105.			
De Kruijk JR, Leffers P, Menheere P, Meerhoff S, Rutten J, Twijnstra A. Prediction of post-traumatic complaints after mild traumatic brain injury: early symptoms and biochemical markers. <i>Journal of Neurology, Neurosurgery and Psychiatry</i> . 2002;73:727-732.			

Primary Sources Cited in Pre-existing Guidelines (Continued)

Iverson GL, McCracken LM. Post concussive symptoms in persons with chronic pain. *Brain Injury*. 1997;11(11):783-790.

Iverson GL. Outcome from mild traumatic brain injury. *Current Opinion in Psychiatry*. 2005;18:301-317.

Lundin A, De Boussard C, Edman G, Borg J. Symptoms and disability until three months after mild TBI. *Brain Injury*. 2006;20(8):799-806.

Ponsford J, Cameron P, Willmott C, Rothwell A, Kelly A, Nelms R, Ng K. Use of the Westmead PTA scale to monitor recovery of memory after mild head injury. *Brain Injury*. 2004;18(6):603-614.

Ponsford J, Willmott C, Rothwell A, Cameron P, Kelly AM, Nelms R, Curran C, Ng K. Factors influencing outcome following mild traumatic brain injury in adults. *Journal of International Neuropsychological Society*. 2000;6(5):568-579.

Powell G. Mild traumatic brain injury and post concussion syndrome: the importance of base rates in diagnosis and clinical information. *Journal of Neurology, Neurosurgery and Psychiatry*. 2008;79:237.

Shores EA, Lammel A, Batchelor J, Hullick C, Flynn M. Utility of the revised Westmead PTA Scale in the acute assessment of mild traumatic brain injury (MTBI) - further analysis in International Neuropsychological Society 2006: Zurich.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.4	Persons with mTBI and complicating health-related or contextual factors should be considered for early referral to a multidisciplinary treatment clinic (Appendix 2.1 capable of managing post concussive symptoms because these factors have been associated with poorer outcomes.	C	Consensus	-

Primary Sources Cited in Pre-existing Guidelines

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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.5	The clinician should consider having a knowledgeable and supportive second-person informant (e.g. partner, family member, close friend, etc.) accompany the patient with mTBI to the initial assessment and to ongoing meetings, if required, to help them better understand the condition and provide an opportunity to discuss any coping difficulties.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.6	Low-level exercise for those who are slow to recover may be of benefit, although the optimal timing following injury for initiation of this treatment is currently unknown. However, 1 month post-injury had been proposed.	C	Silverberg ND, Iverson GL. Is rest after concussion “the best medicine?” Recommendations for activity resumption following concussion in athletes, civilians, and military service members. <i>Journal of Head Trauma Rehabilitation</i> . 2013;28(4):250-259.	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.7	New onset pain and concussive injuries are often co-morbid. Comprehensive evaluation and management of the pain should be considered as it may contribute to negatively influencing other symptoms associated with mTBI.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
5.8	<p><i>Education should be provided in printed material (Appendix 1.3 and 1.4) combined with verbal review and consist of:</i></p> <p>a. <i>Symptoms and expected outcomes.</i></p> <p>b. <i>Normalizing symptoms (education that current symptoms are expected and common after injury event).</i></p> <p>c. <i>Reassurance about expected positive recovery.</i></p> <p>d. <i>Gradual return to activities and life roles.</i></p> <p>e. <i>Techniques to manage stress.</i></p> <p>[NOT AN ORIGINAL RECOMMENDATION - SAME AS 2.10]</p>	<p>A (a-d)</p> <p>C (e)</p>	<p><i>Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury</i></p> <p><i>Bell KR, Hoffman JM, et al. The effect of telephone counselling on reducing posttraumatic symptoms after mild traumatic brain injury: A randomised trial. Journal of Neurology, Neurosurgery and Psychiatry. 2008;79:1275–1281.</i></p>	TBI
Primary Sources Cited in Pre-existing Guidelines				
See 2.10 in current appendix.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.1	For post traumatic headache, take a focused headache history (Table 6.1) in order to identify the headache subtype(s) which most closely resembles the patient's symptoms. To aid in determining the specific phenotype of headache disorder present, refer to the ICHD-II classification criteria in Appendix 6.3. Unfortunately, some post-traumatic headaches are unclassifiable.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.2	Establish the degree of headache-related disability (i.e. missed work/school, decreased productivity, missed social/recreational activities, bedridden) to assist in stratifying a treatment approach (see Appendix 6.5).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.3	Perform a neurologic exam and musculoskeletal exam including cervical spine examination (refer to Appendix 6.5).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.4	Education should be provided on lifestyle strategies and simple, self-regulated intervention strategies that may minimize headache occurrence. For more details on lifestyle management, see Appendix 6.7 .	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.5	Consideration should be given to non-pharmacological therapies targeted to the presumed source of the headache, including relaxation therapy, biofeedback, massage therapy, spinal manipulation, cranial sacral therapy, acupuncture, vision therapy and cognitive behavioral therapy.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.6	All patients with frequent headaches should be required to maintain an accurate headache and medication calendar in order to accurately gauge symptoms and guide management.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.7	Based upon the patient's headache characteristics, consideration may be given to using acute headache medications, limited to <15 days per month, including: 1. Over-the-counter or prescription NSAIDs (eg., Tylenol); 2. Acetylsalicylic acid; 3. Acetaminophen; and 4. Combination analgesics (with codeine or caffeine).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.8	For patients with post-traumatic headaches that are migrainous in nature, the use of or migraine-specific abortant Triptan class medications (i.e., almotriptan, eletriptan, sumatriptan, rizatriptan, zolmitriptan, etc.) may be effective, but should be limited to <10 days per month.	B	Erickson, J.C. Treatment outcomes of chronic post traumatic headaches after mild head trauma in US soldiers: an observational study. <i>Headache</i> . 2011;51:932-944.	TBI
Primary Sources Cited in Pre-existing Guidelines				
N/A				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.9	Narcotic analgesics should be avoided or restricted to "rescue therapy" for acute attacks when other first and second-line therapies fail or are contraindicated.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.10	Prophylactic therapy should be considered if headaches are occurring too frequently, are too disabling, or if acute headache medications are contraindicated or poorly tolerated or are being used too frequently (see Appendix 6.8).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
6.11	Post-traumatic headaches may be unresponsive to conventional treatments. If headaches remain inadequately controlled, referral to a neurologist, pain management specialist, or traumatic brain injury clinic is recommended.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.1	Every person with concussion/mTBI and who had identified sleep problems should be screened for sleep/wake disturbances (e.g., insomnia, excessive daytime sleepiness). See Appendix 7.2 and 7.3.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.2	Screen for medical conditions, current medication use, comorbid psychopathology and risk factors for sleep disturbances, which may influence the sleep/wake cycle (Table 7.1).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.3	Refer for sleep specialist consultation, ideally with experience in assessing mTBI, and polysomnography (e.g. sleep study, Multiple Sleep Latency Test, Maintenance of Wakefulness Test) if sleep disturbances persist or if there is suspicion of sleep-related breathing disorders, nocturnal seizures, periodic limb movements or narcolepsy.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.4	Treating sleep/wake disturbances may positively affect other persistent symptoms (e.g., mood, anxiety, pain, fatigue, cognitive problems). Sleep/wake disturbances should thus be assessed and managed even in the presence of other problems.	C	Consensus	-

Primary Sources Cited in Pre-existing Guidelines			
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.5	All patients with persistent sleep/wake complaints should be placed on a program of sleep hygiene in addition to other interventions (or as part of a program of Cognitive-Behavioral Therapy). See Appendix 7.4 for a sleep hygiene program and Appendix 7.5 for behavioural recommendations for optimal sleep.	C	Consensus	-

Primary Sources Cited in Pre-existing Guidelines			
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.6	Cognitive-Behavioral Therapy (CBT) for Insomnia is established as the treatment of choice for either primary insomnia or insomnia co-morbid to a medical or psychiatric condition.	B	Ouellet MC, Morin CM. Efficacy of cognitive-behavioral therapy for insomnia associated with traumatic brain injury: a single-case experimental design. Archives of Physical Medicine and Rehabilitation. 2007;88:1581-1592.	TBI

Primary Sources Cited in Pre-existing Guidelines			
N/A			

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.7	<p>If medications are to be used, then the aim should be to use medications that will not produce dependency and have minimal adverse effects for mTBI patients. The aim is to establish a more routine sleep pattern.</p> <p>Medications that can be used include Trazodone, Mirtazapine, and tricyclic antidepressants (e.g. amitriptyline).</p> <p>Benzodiazapines should generally be avoided; however, newer non-benzodiazepine medications (e.g. zopiclone, exzopiclone) may have fewer adverse effects and may be considered for short-term use.</p>	C	<p>Flanagan SR, Greenwald B & Weiber S. Pharmacological treatment of insomnia. Journal of Head Trauma Rehabilitation. 2007. 22:67-70</p> <p>Ouellet MC, Beaulieu-Bonneau S, Morin CM. Sleep-Wake Disturbances. In Eds. Archiniegas DB, Bullock MR, Kreutzer JS. Brain Injury Medicine: Principles and Practice. New York; Demos Medical Publishing LLC; 2012.</p> <p>Consensus</p>	-

Primary Sources Cited in Pre-existing Guidelines			
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
7.8	Other non-pharmacologic treatment options that have been found to be useful in the treatment of insomnia include: <ul style="list-style-type: none"> Daily supplements of Magnesium, Melatonin and Zinc. Consider other interventions such as acupuncture, exercise and mindfulness-based stress reduction. 	C	Zollman FS, Larson EB, Wasek-Throm LK, Cyborski CM, Bode RK. Acupuncture for treatment of insomnia in patients with traumatic brain injury: a pilot intervention study. <i>Journal of Head Trauma Rehabilitation</i> . 2012;27(2):135-142. Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.1	Given their prevalence and potential impact, all patients with persistent symptoms following concussion/mTBI should be screened for mental health symptoms and disorders, including: <ul style="list-style-type: none"> depressive disorders (Appendix 8.1) anxiety disorders (Appendix 8.2), including post-traumatic stress disorder (PTSD) (Appendix 8.3 and 8.4) irritability and other personality changes substance use disorders (Appendix 8.5) somatoform disorders 	C	Zollman FS, Larson EB, Wasek-Throm LK, Cyborski CM, Bode RK. Acupuncture for treatment of insomnia in patients with traumatic brain injury: a pilot intervention study. <i>Journal of Head Trauma Rehabilitation</i> . 2012;27(2):135-142. Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.2	The use of self-report questionnaires can aid in the assessment and monitoring of common mental health disorders.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.3	Referral to a psychiatrist/mental health team should be obtained if: <ul style="list-style-type: none"> the presentation is complex and/or severe; the risk of suicide is judged significant; initial treatment is not effective within two months; failure of or contraindication to usual medication strategies; presence of prominent/major risk factors known to potentially affect the course of recovery (see Table 1.1). 	C	New Zealand Guidelines Group, Traumatic Brain Injury: Diagnosis, Acute Management and Rehabilitation	-

Primary Sources Cited in Pre-existing Guidelines			
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"This is the opinion of the Guideline Development Team, or feedback from consultation within New Zealand where no evidence is available."

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.4	<p>Treatment of emotional/behavioural symptoms following mTBI should be based upon individual factors, patient preference, and symptom severity and comorbidity; it may include psychotherapeutic and/or pharmacological treatment modalities. See Algorithm 8.1 which outlines care pathways for different severities.</p> <p>a. Mild, moderate: consider management by a local health care provider, or referral to a psychologist or psychiatrist if unable to manage.</p> <p>b. Severe: consider referral to a psychologist or psychiatrist as required.</p>	C	<p>Department of Veteran Affairs/ Department of Defense. Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury</p> <p>Fann JR, Hart T, Schomer KG. Treatment for depression after traumatic brain injury: a systematic review. <i>Journal of Neurotrauma</i>. 2011;26:2383-2402.</p>	TBI

Primary Sources Cited in Pre-existing Guidelines			
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This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.5	<p>While awaiting specialist referral, the initial steps of treatment should not be delayed, nor symptoms left unmanaged. General measures can be instituted and common symptoms such as headache, sleep disturbance, dizziness, and pain addressed in an ongoing manner.</p>	C	Consensus	-

Primary Sources Cited in Pre-existing Guidelines			
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.6	<p>Cognitive-Behavioral Therapy (CBT) has well-established efficacy for treatment of primary mood and anxiety disorders; as such, it may be appropriate in the treatment of mood and anxiety symptoms following mTBI.</p>	A	<p>Al Sayegh A, Sandford D, Carson AJ. Psychological approaches to treatment of postconcussion syndrome: a systematic review. <i>Journal of Neurology, Neurosurgery and Psychiatry</i>. 2010;81(10):1128-1134.</p>	TBI

Primary Sources Cited in Pre-existing Guidelines			
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N/A

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.7	<p>When prescribing any medication for patients who have sustained an mTBI, the following should be considered:</p> <ol style="list-style-type: none"> Use caution when initiating pharmacologic interventions to minimize potential adverse effects on arousal, cognition, motivation, and motor coordination. Start at the lowest effective dose and titrate slowly upwards, based upon tolerability and clinical response. Allow adequate time and dosing for drug trials. Avoid making more than one medication change at a time (i.e., when adding new medications, or changing doses). Doing 'one thing at a time' will enable more accurate assessment of drug benefits and potential adverse effects. Follow-up should occur at regular intervals: initially more frequently while increasing medication to monitor tolerability and efficacy. <p>For more details regarding pharmacotherapy after mTBI, refer to Table 8.1.</p>	C	<p>Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury</p> <p>Consensus</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.8	<p>A selective serotonin reuptake inhibitor (SSRI) is generally recommended as the first-line pharmacological treatment for mood and anxiety syndromes after mTBI. However, in some cases the combination of sedative, analgesic, and headache prophylaxis effects from a tricyclic (TCA) may be desirable, although these agents may generally be considered second-line.</p>	A	<p>Fann JR, Hart T, Schomer KG. Treatment for depression after traumatic brain injury: a systematic review. <i>Journal of Neurotrauma</i>. 2011;26:2383-2402.</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

N/A

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.9	<p>After successful treatment of depression with an SSRI, the optimal duration of continuation/maintenance treatment remains inconclusive.</p>	A	<p>Rapoport MJ, Mitchell RA, et al. A randomized controlled trial of antidepressant continuation for major depression following traumatic brain injury. <i>Journal of Clinical Psychiatry</i>. 2010;71(9):1125-1130.</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

N/A

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
8.10	SSRIs are also recommended as first-line pharmacotherapy for PTSD after mTBI; SNRI venlafaxine may be considered second-line. Both can improve the core symptom of re-experiencing, hyperarousal, and avoidance. Marked sleep disruption may require adjunctive treatment with trazodone, mirtazapine, or prazosin. Prazosin in particular can decrease trauma-related nightmares. Benzodiazepines do not reduce the core symptoms of PTSD; their long-term use to manage PTSD is not recommended.	C	Bajor LA, Ticlea AN, et al. Psychopharmacology Algorithm Project at the Harvard South Shore Program: an update on posttraumatic stress disorder. Harvard Review of Psychiatry. 2011;19(5):240-258. Forbes D, Creamer M, et al. A guide to guidelines for the treatment of PTSD and related conditions. Journal of Traumatic Stress. 2010;23(5):537-552. Susskind O, Ruzek JI, et al. The VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress (update 2010): development and methodology. Journal of Rehabilitation Research and Development. 2012;49(5):xxvii-xxviii.	Adults, general population
Primary Sources Cited in Pre-existing Guidelines				
N/A				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
9.1	A patient sustaining a concussion/mTBI should be evaluated for cognitive difficulties using a focused clinical interview, in conjunction with a validated post concussive questionnaire (Appendix 1.5) and cognition screening tool (Appendix 9.1).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
9.2	Certain conditions can affect cognition, such as ADHD, learning disabilities, anxiety or mood disorders, pain, fatigue, sleep disturbance, neuroendocrine dysfunction or substance abuse. These conditions can be comorbid with mTBI and should be considered and evaluated as necessary.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
9.3	<i>A patient experiencing reduced cognitive functioning in the first few days following injury, with education and support, should be expected, in the majority of cases, to have these symptoms resolve and pre-injury cognitive functioning return within days, up to three months.</i> [NOT AN ORIGINAL RECOMMENDATION - SAME AS 2.4]	A	<i>Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury</i>	TBI
Primary Sources Cited in Pre-existing Guidelines				
See 2.4 in the current appendix.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
9.4	Patients who have cognitive symptoms that are not resolving and continue to interfere in daily functioning (e.g., school, work) should be considered for referral for neuropsychological assessment. The evaluation may assist in clarifying appropriate treatment options based on individual patient characteristics and conditions.	A	Binder LM, Rohling ML, et al. A review of mild head trauma, Part I: Meta-analytic review of neuropsychological studies. <i>Journal of Clinical and Experimental Neuropsychology</i> . 1997; 19(3):421–431. Vanderploeg RD, Curtiss G, et al. Adverse long-term neuropsychological outcomes following mild traumatic brain injury. <i>Journal of the International Neuropsychological Society</i> . 2005;11:228-236.	TBI
Primary Sources Cited in Pre-existing Guidelines				
N/A				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
9.5	Rehabilitation of cognitive impairments should be initiated if: a. The individual exhibits persisting cognitive impairments on formal evaluation, or b. The learning of compensatory strategies is necessary in order to facilitate the resumption of functional activities and work.	C	Workplace Safety and Insurance Board of Ontario, Mild Traumatic Brain Injury Program of Care	TBI
Primary Sources Cited in Pre-existing Guidelines				
N/A				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
9.6	For cognitive sequelae following mTBI, the cognitive rehabilitation strategies that should be considered include compensatory strategies and remediation approaches.	A	Tiersky LA, Anselmi V, et al. A trial of neuropsychologic rehabilitation in mild-spectrum traumatic brain injury. <i>Archives of Physical Medicine and Rehabilitation</i> . 2005;86:1565-74	TBI

Primary Sources Cited in Pre-existing Guidelines			
N/A			

mTBI Guideline	Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
9.7 If persisting cognitive deficits are identified by neuropsychologists or other health professionals, efforts should be made to inform employers or teachers of possible temporary accommodations to tasks or schedules (see Section 12) so as to avoid excessive anxiety related to cognitive difficulties and experiencing of repeated errors or setbacks in work or school.	C	Consensus	-

Primary Sources Cited in Pre-existing Guidelines			
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mTBI Guideline	Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.1 Evaluation should include a thorough neurologic examination that emphasizes vision, vestibular, balance and coordination, and hearing. See Table 10.1 for specific exam details.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI

Primary Sources Cited in Pre-existing Guidelines			
This recommendation has a consensus grade.			

mTBI Guideline	Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.2 If symptoms of benign positional vertigo are present, the Dix-Hallpike Manoeuvre (see Appendix 10.1) should be used for assessment.	A	Cochrane Systematic Review: Hilton MP, Pinder DK (2009). The Epley (canalith repositioning) manoeuvre for benign paroxysmal positional vertigo.	Mixed

Primary Sources Cited in Pre-existing Guidelines			
N/A			

mTBI Guideline	Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.3 A canalith repositioning maneuver (Appendix 10.1) should be used to treat Benign Positional Vertigo if the Dix-Hallpike Maneuver is positive.	A	Cochrane Systematic Review: Hilton MP, Pinder DK (2009). The Epley (canalith repositioning) manoeuvre for benign paroxysmal positional vertigo.	Mixed

Primary Sources Cited in Pre-existing Guidelines			
N/A			

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.4	For persons with functional balance impairments and screening positive on a balance measure, consideration for further balance assessment and treatment by a qualified health care professional may be warranted pending clinical course.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.5	Vestibular rehabilitation therapy is recommended for unilateral peripheral vestibular dysfunction.	A	Cochrane Systematic Review: Hillier SL, McDonnell M (2011). Vestibular rehabilitation for unilateral peripheral vestibular dysfunction (Review).	Mixed
Primary Sources Cited in Pre-existing Guidelines				
N/A				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.6	When the patient identifies a problem with hearing the following steps should be followed: 1. Perform an otologic examination. 2. Review medications for ototoxicity. 3. Refer to audiology for hearing assessment if no other apparent cause is found.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.7	When the patient identifies a problem with nausea the following steps should be followed: 1. Define triggers and patterns of nausea and conduct appropriate investigations as required 2. Assess medication list for agents that may cause or worsen GI symptoms. 3. Perform oropharyngeal examination. 4. Assess vision and vestibular/ balance systems	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.8	Take an appropriate case history, including questions on visual blur, scanning/reading ability, light sensitivity, diplopia, eyestrain, motion sensitivity, and spatial deficits (indicating loss of visual field integrity). See Table 10.2 for symptoms and their related vision dysfunction.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.9	Perform tests of visual acuity, extra-ocular motility, vergence, visual fields, pupils, and funduscopy. See Appendix 10.2 for an explanation of screening techniques.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
10.10	Other functional vision changes should be given consideration for referral to a qualified optometrist specializing in neuro-optometric rehabilitation for vision therapy.	B	Ciuffreda KJ, Rutner D, et al. Vision therapy for oculomotor dysfunctions in acquired brain injury: a retrospective analysis. <i>Optometry</i> . 2008;79(1): 18-22.	TBI
Primary Sources Cited in Pre-existing Guidelines				
N/A				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
11.1	Determine whether fatigue is a significant symptom by taking a focused history and reviewing the relevant items from administered questionnaires (Appendix 11.1).	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
11.2	Characterize the dimensions of fatigue (e.g. physical, mental, impact on motivation) and consider alternative or contributing, treatable causes that may not be directly related to the injury. Please refer to Table 11.1 for further information about primary and secondary causes, as well as appropriate treatment strategies for different types of fatigue.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
-				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
11.3	<p>If identified as a significant symptom, some key consideration that may aid in the management of persistent fatigue can include:</p> <ul style="list-style-type: none"> • Aiming for a gradual increase in activity levels that will parallel improvement in energy levels. • Reinforce that pacing activities across the day will help patients to achieve more and to avoid 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. <p>Provide patients with a pamphlet containing advice on coping strategies for fatigue (see Appendix 11.3).</p>	C	New Zealand Guidelines Group, Traumatic Brain Injury: Diagnosis, Acute Management and Rehabilitation	TBI

Primary Sources Cited in Pre-existing Guidelines

N/A

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.1	<p>Immediately following any concussion/mTBI, individuals who present with and/or report post-injury symptoms should have a period of rest to facilitate a prompt recovery and should be provided with recommendations to avoid activities that would increase their risk for sustaining another concussion. This is particularly important during the recovery period.</p>	C	<p>Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury</p> <p>Consensus</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.2	Bed rest exceeding 3 days is not recommended.	C	<p>Silverberg ND, Iverson GL. Is rest after concussion “the best medicine?” Recommendations for activity resumption following concussion in athletes, civilians, and military service members. Journal of Head Trauma Rehabilitation. 2013;28(4):250-259.</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.3	Individuals with mTBI should be encouraged to gradually return to normal activity (work, physical, school, duty, leisure) based upon their tolerance.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.4	If a person's normal activity involves significant physical activity, exertion testing can be conducted that includes stressing the body (e.g., graded treadmill exercise test). If exertion testing results in a return of symptoms, a monitored progressive return to normal activity as tolerated should be recommended.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.5	Low-level exercise for those who are slow to recover may be of benefit, although the optimal timing following injury for initiation of this treatment is currently unknown. However, 1 month post-injury had been proposed.	C	Consensus Statement on Concussion in Sport – The 4th International Conference in Zurich (2013)	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.6	In instances where there is high risk for injury/re-injury and/or there is a possibility that the individual may not be able to safely and competently complete specific work-related tasks and duties, a more in-depth assessment of symptoms should be conducted and necessary accommodations and work restrictions identified.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI
Primary Sources Cited in Pre-existing Guidelines				
This recommendation has a consensus grade.				

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.7	<p>Individually based work restriction should apply if:</p> <ul style="list-style-type: none"> • There is a work specific task that cannot be safely or competently completed based on symptoms • The work/duty environment cannot be adapted to the patient's symptom-based limitation • The deficits cannot be accommodated • Symptoms reoccur <p>Examples of vocational modifications include:</p> <ul style="list-style-type: none"> • Modification of the length of the work day • Gradual work re-entry (e.g., starting at 2 days/week and expanding to 3 days/week) • Additional time for task completion • Change of job • Environmental modifications (e.g., quieter work environment; enhanced level of supervision) 	C	<p>Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury</p> <p>Consensus</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.8	<p>Individuals who continue to experience persistent impairments following mTBI, or those who have not successfully resumed pre-injury work duties following injury, should be referred for a fuller in-depth vocational evaluation by clinical specialists and teams (e.g. occupational therapist, vocational rehabilitation counselor, occupational medicine physicians, neuropsychologists, speech language pathologists) with expertise in assessing and treating concussion/mTBI. This evaluation should include an assessment of the person, occupational and job demands, work environment, environmental supports, and facilitators and barriers to successful work/return to work (see Appendix 12.1).</p>	B	<p>Stergiou-Kita M, Dawson D, Rappolt S. Inter-professional clinical practice guideline for vocational evaluation following traumatic brain injury: a systematic and evidence-based approach.</p>	TBI

Primary Sources Cited in Pre-existing Guidelines

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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.9	A referral to a structured program that promotes community integration (e.g. volunteer work) may also be considered for individuals with persistent post-concussive symptoms that impede return to pre-injury participation in customary roles.	C	Department of Veteran Affairs/ Department of Defense, Clinical Practice Guideline – Management of Concussion/Mild Traumatic Brain Injury Consensus	TBI

Primary Sources Cited in Pre-existing Guidelines

This recommendation has a consensus grade.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.10	<i>On presentation, the primary care provider should conduct a comprehensive review of every patient who has sustained mTBI (Appendix 1.1). The assessment should include taking a history, examination, cognitive screen, post concussive symptom assessment and review of mental health. (Table 1.2)</i> [NOT AN ORIGINAL RECOMMENDATION - SAME AS 1.2]	A	<i>Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury Following Closed Head Injury</i>	TBI

Primary Sources Cited in Pre-existing Guidelines

See 1.2 in the current appendix.

mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.11	If symptomatic within the first 72 hours, the student should refrain from attending school and from participating in all academic activities, including apprenticeship, practicum, and shop related activities, in order to support cognitive rest and facilitate recovery.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.12	If asymptomatic within the first 72 hours, the student can attend school but should not undergo evaluations (tests/exams) or should write with accommodations (such as separate space/breaks). The student should also be monitored for the emergence of potential symptoms.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.13	<p>After 72 hours post-injury, the individualized profile of the student's symptoms should be considered:</p> <ul style="list-style-type: none"> • If the student is symptom-free, then he/she should go back to academic and/or program-related activities gradually as tolerated, as long as the student remains asymptomatic. • If still experiencing symptoms after 72 hours post-injury, the student should refrain from attending academic and/or program-related activities for one full week. The health care provider (with permission) should also notify student services or the special needs department that a concussion has occurred (see Appendix 12.2) and that the student will require time off, and may require accommodations and support for reintegration. 	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.14	If symptoms are still functionally debilitating at one week post-injury, the student should refrain from attending academic and/or program-related activities for another week. The health care provider should notify student services or the special needs department that the student is still symptomatic and accommodations and support for reintegration will be required.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.15	After two weeks following an mTBI, the student should start attending school (non-physical activities) very gradually as tolerated and with accommodations, even if he/she is still experiencing symptoms. Student services or the special needs department should be identified to notify teachers/professors to subsequently monitor progress with the student and adjust return to school plan, as necessary.	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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mTBI Guideline		Level of Evidence	Source of Recommendation (i.e., pre-existing literature, expert consensus)	Population Addressed by Source (TBI or other)
12.16	If re-integration into school is ineffective or unproductive at 4 weeks (i.e., symptoms plateau/continue to get worse), consider the following: <ul style="list-style-type: none"> Greater Accommodations: Work with the professor/instructor or appropriate administrator and the student to look at the cognitive demands of various classes, with consideration of the student's current symptoms, to determine if appropriate accommodations can be made in the following areas as necessary: curriculum, environment, activities, and timetable (see Appendix 12.3). Move the student's courses to audit status, allowing them to participate in some academic activity without significant pressure from course requirements and examination; Review whether the student should continue in the program for that term if there will be substantially negative consequences to their grades and program participation. 	C	Consensus	-
Primary Sources Cited in Pre-existing Guidelines				
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