

General considerations

Mental health disorders are common following mTBI, and appear to be major determinants of post-mTBI wellness and functional recovery. This includes disorders of mood which consist of symptoms related to depression and anxiety. The etiology of mTBI/concussive mood disorders may be related to reactive or environmental factors such as the experience of the trauma resulting in the injury (e.g., manifesting in post-traumatic stress symptoms, phobias and related anxieties) or to the negative outcomes following the injury (i.e., depression related to not participating in important roles such as work or school, sports, etc.) They may also manifest in response to the chronic symptoms that can follow concussion/mTBI or any physical injuries such as poor sleep, persistent headaches, chronic pain, medications, etc. Indeed, all of these types of outcomes can contribute, causally, to distress and to disorders of mood. Reciprocally, in what can be considered a 'vicious cycle of pathology', disorders of mood can exacerbate chronic pain, sleep disturbance, anergia and cognitive inefficiencies. This approach to considering disorders of mental health is important when attempting to holistically assess for and manage an individual's outcomes post-mTBI. The disorders of mood related to increased irritability, intolerance, reduced patience and mood reactivity may be related to the neurobiological impact of the injury and/or a reaction to challenges of managing stimulation early on following the injury.

Mental health symptoms and outcomes must be understood within the biopsychosocial context of the individual and that multiple factors can influence related mental health disorders. In the case of mTBI, biologically the individual may suffer an insult to the brain and injuries to the body (e.g., whiplash injuries, etc.), with consequences to their experience of pain and ability to sleep, which can further cause changes in the neurobiology of the brain. At the psychological level they may experience acute stress due to their experience of trauma or injury, as well as in response to the consequences to their functional abilities resulting from the injury. People with persistent symptoms may become isolated from others as they may be intolerant of or unable to engage in social interactions. Their injury status may disrupt their occupational status, leisure activities and interpersonal interactions. They may also incur losses (e.g., reduced quality of life and independence; lowered income or reduced educational attainment; changes in relationship functioning, etc.). When assessing and managing disorders of mental health post mTBI, it is important to consider all of these potential factors; additionally, individuals who have suffered an mTBI may also have a pre-existing history of biopsychosocial factors/issues that may affect the expression of mental health symptoms or the duration of recovery including the ability to return to pre-injury status.

It is often difficult to obtain timely assessments and treatment interventions from mental health experts. Delays can, and often do, contribute to worse outcomes, and so it is important that primary care providers intervene as soon as possible. Screening for mental health symptoms and determining their etiology as well as prescribing treatment is crucial to facilitating a positive recovery. For example, in a primary care setting this may include screening for disturbances of sleep, or presence of chronic pain, loss, metabolic status etc when patients report low affect. Intervening at the level of improving sleep, managing pain and correcting metabolic imbalances may result in improving reports of low affect. If psychological and social issues appear to be causing mental health symptoms then appropriate therapeutic and/or medication strategies should be employed.

Finally, there is no current evidence to indicate that the mental health problems of individuals who have suffered an mTBI should be treated any differently than mental health problems of other etiologies. For example, we do not have evidence that Major Depressive Disorder (MDD) post-mTBI should be treated differently than MDD that may develop for other psychosocial or biological factors. As such, pharmacological and nonpharmacological interventions including therapeutic interventions that have been found to be helpful in the general population should be considered for individuals who have developed mental health problems post mTBI. Strategies used to treat mental health symptoms post concussion/mTBI should follow the same logic as that applied to similar symptoms found secondary to their conditions or circumstances which include the potential for treatments to worsen other mTBI outcomes. For example, some antidepressant medications, particularly those that are more sedating and/or have greater anticholinergic activity, can worsen the anergia and cognitive impairments that arise directly from mTBI. Another example is the concern for exacerbating seizure risk; fortunately, seizures are a relatively rare outcome of mTBI (although one that must be considered and, depending on the history, assessed for when considering certain psychotropic medications). Some medications can also contribute to worsening of balance impairment, or dizziness, and other symptoms. The need, then, is to select treatment interventions for which there is some evidence of efficacy

(often this will be derived from studies done in the non-mTBI population) while carefully considering and assessing for, the potential to exacerbate other mTBI-related outcomes. In general, psychotropic medications should be used with caution, and non-medication options selected as much as possible. If selecting a medication intervention, start at low doses, allow adequate time for response to be assessed for, and carefully monitor for both efficacy and side effects.

Assessment

Acute concussive symptoms can include irritability, anxiety, emotional lability, depressed mood and apathy.¹⁻³ Early education and treatment focused on symptom management is important. If symptoms persist, the risk of increasing symptom intensity is heightened manifesting in more severe mental health symptoms such as Major Depressive Disorder (MDD) and Post-Traumatic Stress Disorder (PTSD).⁴ Depressive disorders following TBI are commonly associated with increased irritability and often comorbid with anxiety symptoms as well as with fatigue, sleep disturbances, cognitive dysfunction, decreased mobility, emotional processing deficits and anxiety syndromes. The latter include generalized anxiety, panic attacks, phobic disorders, and post-traumatic stress disorder (PTSD).^{2,3,5} These disorders comprise both new conditions that develop *de novo* post-injury, as well as those reflecting an exacerbation of pre-injury conditions or vulnerabilities.¹

Regardless of etiology these disorders require prompt recognition, identification and treatment, given their frequency and potential to impede recovery in other symptom domains^{1,6} as well as result in significant functional declines. Pre-existing difficulties such as substance use disorders and poor psychosocial adjustment also place patients at risk for a protracted recovery or a recovery that is much longer than expected.⁷⁻⁹ Females on average take longer to recover and are at higher risk for anxiety and depressive disorders after TBI.^{4,9,10} Delays in returning to social and vocational roles can in turn produce demoralization and worsened emotional symptoms.^{1,4,11}

The assessment of mental health disorders can be challenging given the overlap in symptoms between mood disorders, sleep disorders, pain syndromes, as well as cognitive difficulties. “Subthreshold” variants of certain conditions, particularly anxiety-based disorders such as PTSD are also observed, in which a symptom cluster falls short of meeting formal diagnostic criteria for a more commonly known disorder, but diagnostically fall into other trauma-related syndromes and require treatment. In general, it is recommended that DSM 5 diagnostic criteria be applied in an “inclusive” manner: for example, counting all relevant symptoms toward a potential diagnosis of depression, regardless of whether the mTBI alone could have caused the symptom^{12,13} Potential contributing medical conditions should also be identified, such as anemia, thyroid dysfunction, B12 deficiency, and so forth. If a mental health condition exists appropriate care should be provided or appropriate referrals made. In situations of diagnostic uncertainty, appropriate referrals should be made.

Various self-report questionnaires can aid the clinician in assessing mental health disorders and offer the advantage of yielding criterion-based diagnoses as well as severity ratings to monitor progress: the *Patient Health Questionnaire 9-item scale* (PHQ-9; [Appendix 8.1](#)) for depression; the *Generalized Anxiety Disorder 7-item scale* (GAD-7; [Appendix 8.2](#)) and the short *Primary Care PTSD Screen* (PC-PTSD; [Appendix 8.3](#)) or the longer *PTSD Checklist* (PCL-5; [Appendix 8.4](#)); and the *CAGE-AID* questionnaire for substance use (i.e., alcohol; [Appendix 8.5](#)). Note that these questionnaires have not been validated specifically with the mTBI population

RECOMMENDATIONS FOR ASSESSMENT OF MENTAL HEALTH DISORDERS

		GRADE
8.1	<p>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:</p> <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 <p>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.</p>	B

Management

Treatment is indicated when symptom levels cause distress and negatively impact interactions, function and quality of life or clearly are impeding recovery. Once identified, appropriate psychological and/or pharmacological treatment should be initiated. Medication consultation can be provided by a psychiatrist while therapy interventions may be provided by psychologists or other mental health specialists. Treatment should be initiated early to reduce the risk of worsening symptoms and/or having symptoms become entrenched. Medical issues should be managed concurrently such as headaches, dizziness and comorbid pain. Immediate approaches should include concussion/mTBI education regarding the positive expectations for recovery as well as general support, validation and reassurance.¹⁴⁻¹⁷ Involvement of the family can be very helpful at this stage. Education about regular light exercise should be provided, as well as other important lifestyle information including balanced meals, keeping a routine, seeking social support, etc. General lifestyle measures can have some positive effect on mood, perceived fatigue and well-being, and can counteract deconditioning. See [Algorithm 8.1](#), which outlines care pathways for mild to moderate and severe mental health disorders following concussion/mTBI.

Non-Pharmacological (Psychosocial) interventions

Psychological interventions are critical in the management of primary mental health disorders and include counselling and formal psychotherapies. Cognitive behavioural therapy (CBT) refers to a structured set of strategies focused on managing negative emotion and building coping strategies by altering maladaptive thought patterns and behaviour. There is robust support for the efficacy of this treatment across a range of mental health conditions which include those affecting individuals with concussion/mTBI (e.g., various types of depression and anxieties, insomnia, chronic pain, etc.) with some modifications in procedure indicated for individuals with cognitive challenges.^{9,17-19} The psychotherapeutic intervention applied should be appropriate for the mental health condition diagnosed post concussion/mTBI.²⁰

The decision to recommend psychological intervention will depend on factors such as patient preference and motivation, symptom severity and comorbidity, skills and experience of the treating clinician, and the ease of access to such resources. Primary care providers may be well-suited to provide supportive counselling, along with low-intensity interventions based on CBT principles.²¹ For more difficult symptom presentations cases, such as moderate to severe depression or anxiety, persistent PTSD, or the presence of complex comorbidities referral for specialist treatment should be sought. Combined treatment with medication may also be appropriate.

RECOMMENDATIONS FOR <u>NON-PHARMACOLOGICAL</u> TREATMENT OF MENTAL HEALTH DISORDERS		
		GRADE
8.2	If a mental health disorder is determined to be present, then the treatment of the emotional/behavioural symptoms should be based upon individual factors, patient preference, symptom severity and comorbidity, and existing practice guidelines for the treatment of the diagnosed condition (e.g., depression, anxiety, PTSD). ^a	C
8.3	Immediate referral to a regulated mental health practitioner should be obtained if: <ul style="list-style-type: none"> • The presentation is complex and/or severe (e.g., suicide risk) • Initial treatment is not effective • There is a failure of or contraindication to usual medication strategies It is not necessary for the mental health practitioner to be someone who has a specialty in the treatment of concussion.	C
8.4	While awaiting specialist referral, the primary care provider should clinically manage: <ul style="list-style-type: none"> • Mental health symptoms • General medical issues (e.g., rule out hormonal disturbances, viral infection) • Concussion symptoms (e.g., headache, sleep disturbances, dizziness, pain) • Commence accommodations (return-to-activity, school, work) 	C
8.5	Cognitive behavioural therapy (CBT) and other psychotherapeutic modalities have well-established efficacies for the treatment of primary mood and anxiety disorders in the mental health and other neurological populations; with emerging evidence in the post-concussive population. Given the evidence, psychotherapy should be recommended for patients with persistent mood and anxiety issues following concussion.	A

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

Pharmacological interventions

Medication may be required for those with moderate to severe, persistent depressive or anxiety symptoms. Selective serotonin reuptake inhibitors (SSRIs) and Serotonin norepinephrine reuptake inhibitors (SNRIs) are recommended as first-line treatments for diagnosed mental health conditions following concussion/mTBI, based upon their side-effect profile and broader utility when compared to agents from other classes.^{9,22} Current evidence supports the utility of SSRIs and SNRIs in treating depression, reducing anxiety and irritability, and, in some reports, improving cognition, somatic symptoms and psychosocial function.²² The efficacy and tolerability of both sertraline²³ (starting at 25 mg; aiming for 50-200 mg/day) and citalopram (starting at 10 mg; aiming for 20-40 mg/day) is supported within the mTBI literature.^{1,24} Common clinical experience suggests that other agents (e.g., alternate SSRIs, venlafaxine, mirtazepine) may also be useful for diagnosed mental health conditions following mTBI, yet clinical data with these agents is lacking. There are no studies indicating specific medication treatment for PTSD for individuals with concussion/mTBI, yet the use of sertraline, paroxetine and venlafaxine are supported by high-quality evidence in the non-TBI population.^{22,25} In the absence of additional data specific to TBI, the use of treatment algorithms developed for primary mental health disorders may be appropriate, albeit with some qualifications.

The concussion/mTBI population may be more sensitive to adverse medication effects upon cognition (alertness, attention, memory), balance and dizziness, sleep and fatigue, and headaches. Anticholinergic effects of certain tricyclic medications (e.g., amitriptyline, imipramine, doxepin) should be carefully monitored. Although uncommon, the risk of post-traumatic seizures (epilepsy) after concussion/mTBI remains elevated and accounts for 10–20% of epilepsy cases in the general population²⁶ at about 1.5 times the rate for the general population for 1-4 years after injury.¹⁰ Up to 86% of patients with one seizure after TBI will have a second seizure within 2 years of their injury.²⁷ Medications with greater impact upon the seizure threshold, such as clomipramine, maprotiline, and the immediate-release formulation of bupropion, should be avoided in favour of newer agents.²⁸ The use of benzodiazepines as first-line therapy or in the long-term treatment for anxiety, agitation or aggressiveness after concussion/mTBI is generally not recommended due to potential effects on arousal, cognition, and motor coordination.^{24,29} The potential for abuse/dependency associated with these agents is also of concern, given the elevated rates of pre-injury substance use disorders observed among TBI patients.^{9,24} Nonetheless, short-term use of these agents may be helpful during periods of crisis or acute distress.

Strategies related to discontinuation of pharmacotherapy should be based on guidelines appropriate to the diagnosed mental health condition. Special consideration is not currently indicated for concussion/mTBI.³⁰ In the absence of strong reasons for early termination (such as tolerance issues), successful pharmacotherapy should be continued for at least 6 months before a trial of slow tapering is considered. Relapse prevention strategies should also be considered with psychological treatment approaches.

Table 8.1 General Considerations Regarding Pharmacotherapy after concussion/mTBI

- Prior to starting treatment, ensure that significant psychosocial difficulties are being addressed (e.g., ongoing domestic abuse, major family/caregiver conflict, other environmental issues).
- Before prescribing a new treatment, review current medications including over-the-counter medicines and supplements. If possible, minimize or stop agents that may potentially exacerbate or maintain symptoms.
- Drug therapy should target specific symptoms to be monitored during the course of treatment (e.g., dysphoria, anxiety, mood lability, irritability, as well as fatigue, sleep, headaches and pain).
- In choosing amongst therapies, aim to minimize the impact of adverse effects upon arousal, cognition, sleep and motor coordination, as well as seizure threshold—domains in which TBI patients may already be compromised.
- A specific selective serotonin reuptake inhibitor (SSRI) is recommended as first-line treatment for mood and anxiety syndromes after mTBI. Other antidepressants may also be considered as described in the accompanying text. The use of benzodiazepines as first-line therapy for anxiety after concussion/mTBI is not encouraged.
- Start at the lowest effective dose and titrate slowly upwards, monitoring tolerability and clinical response, yet also aim for adequate dosing and trial duration. Inadequacies of either are frequent causes of treatment failure. At times the maximum tolerated doses may be required.
- Use of a single agent to alleviate several symptoms is ideal (e.g., tricyclic [TCA] for depression, sleep disruption and headache relief). However, as individual post-concussive symptoms do not necessarily show a coupled response to treatment, a combination of strategies may be ultimately required (e.g., SSRI plus low-dose TCA for mood and headache treatment).
- Limited quantities of medications should be offered to those at an elevated risk for suicide.
- To prevent relapse, consider continuing successful pharmacotherapy for at least 6 months prior to a trial of slowly tapering medication.

Adapted from Silver JM, Arciniegas DB, Yudovsky SC. Psychopharmacology. In: Silver JM, Arciniegas DB, Yudovsky SC, eds. *Textbook of Traumatic Brain Injury*. Arlington, VA: American Psychiatric Publishing Inc;2005:609-640.

RECOMMENDATIONS FOR PHARMACOLOGICAL TREATMENT OF MENTAL HEALTH DISORDERS		GRADE
8.6	<p>When prescribing any medication for patients who have sustained a concussion/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 duration 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 concussion/mTBI, refer to Table 8.1.^a</p>	C
8.7	<p>A SSRI is generally recommended as the first-line pharmacological treatment for mood and anxiety syndromes after concussion/mTBI. In some cases, however, the combination of sedative, analgesic, and headache prophylaxis effects from a tricyclic (TCA) may be desirable, yet these agents may generally be considered second-line. Other second-line options include mirtazapine, an alternate SSRI, or an SNRI.</p>	A
8.8	<p>After successful treatment with an antidepressant, maintenance treatment for at least 6-9 months is advised to reduce the risk of relapse.</p>	C
8.9	<p>SSRIs or SNRI's are recommended as first-line pharmacotherapy for PTSD after concussion/mTBI; both can improve the core symptom of re-experiencing, hyperarousal and avoidance.</p> <ul style="list-style-type: none"> Persisting sleep disruption may require adjunctive treatment with trazodone, mirtazapine, low-dose tricyclic 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

RESOURCES		
APPENDICES		
1	Patient Health Questionnaire 9-Item Scale (PHQ-9) for Depression	Appendix 8.1
2	Generalized Anxiety Disorder 7-Item Scale (GAD-7)	Appendix 8.2
3	Primary Care PTSD Screen (PC-PTSD)	Appendix 8.3
4	PTSD Checklist (PCL-5)	Appendix 8.4
5	CAGE and CAGE-AID Questionnaire	Appendix 8.5
6	Other Links/ Resources to consider	Appendix F
TABLES		
1	General Considerations Regarding Pharmacotherapy after mTBI	Table 8.1
ALGORITHMS		
1	Assessment and Management of Persistent Mental Health Disorders Following mTBI	Algorithm 8.1

References

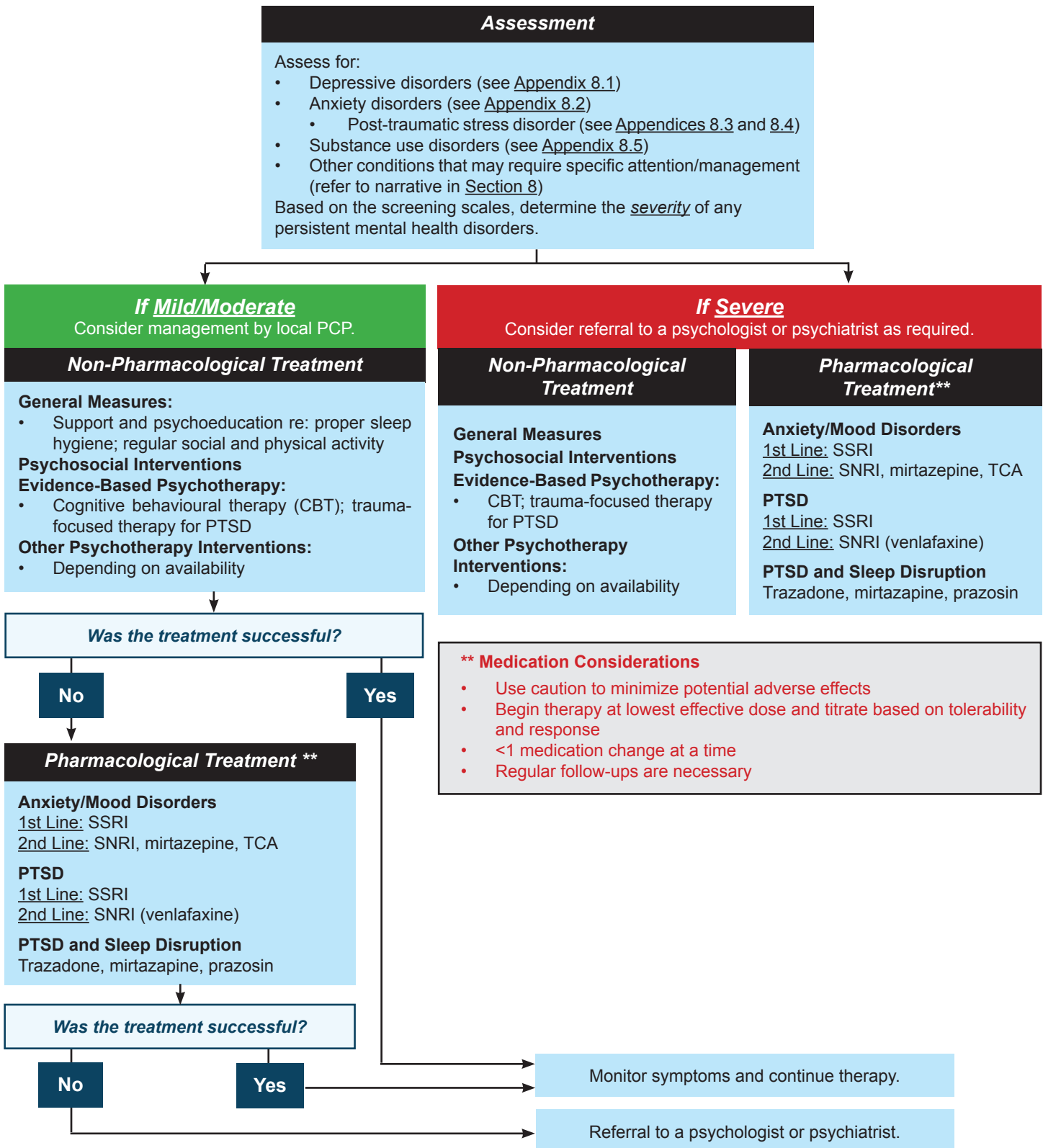
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a. Adapted from the *VA/DoD Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline (VA/DoD, 2009)*.

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Algorithm 8.1

Assessment and Management of Mental Health Disorders Following concussion/mTBI



For a narrative description and guideline recommendations related to this algorithm, please refer to **Section 8**.