

6 Post-Traumatic Headache

Headache is the most common and among the most prevalent persistent symptoms following mTBI.¹⁻⁴ Studies to date have documented that anywhere from 30-90% of individuals who sustain a mTBI develop post-traumatic headache.^{2,5} Interestingly, several researchers have reported that post-traumatic headache is more common after concussion/mTBI than after severe TBI.⁵⁻¹⁷ Notably, post-traumatic headache is associated with a high degree of disability¹ and is more chronic and persistent than previously thought.¹⁸ The vast majority of people with post-traumatic headache improve within days or weeks; however, for some individuals, headaches may persist beyond this time frame up to months or years. The International Classification of Headache Disorders (ICHD-III)¹⁹ includes diagnostic criteria for both acute (see [Appendix 6.1](#)) and persistent post-traumatic headache following mTBI (see [Appendix 6.2](#)).

Unfortunately, the management of persistent post-traumatic headache is often difficult and there is a paucity of research in the area and no evidence-based treatment guidelines available to guide management. Post-traumatic headache is classified as a secondary rather than primary headache subtype. Headache subtypes are then based upon clinical characteristics that best fit primary headache categories (i.e. migraine- or tension-type headaches).¹³ Comorbid conditions and psychological disorders such as post-traumatic stress disorder (PTSD) contribute to the complexity of managing post-traumatic headache.^{13,20,21} Accordingly, post-traumatic headache should not be treated as an isolated condition¹⁵ and the management of symptoms is based upon clinical experience and expert opinion.¹⁹

In line with this, diagnostic criteria for the common phenotypes of post-traumatic headache are provided in [Appendix 6.3](#), and individual treatment pathways for these classes of primary headaches can be found in [Algorithm 6.1](#). Clinical studies to date have been conflicting regarding the type of headache that most commonly occurs in post-traumatic headache. Some studies have suggested that the headaches most commonly resemble migraine headaches, whereas other studies have suggested that headaches more commonly resemble tension-type headache.^{3,8,14,16,22-27}

Unfortunately, too frequent use of analgesics is a significant problem in many individuals suffering from persistent post-traumatic headaches.^{8,16} It is well known that too frequent use of analgesics/acute headache medications can, in some, perpetuate and lead to chronification of headaches via the phenomenon of medication overuse (“rebound”) headache. Accordingly, it is important to provide clear instructions on the maximal allowable daily dosing and the maximum allowable monthly frequency of medication consumption - combination analgesics, narcotic analgesics, ergotamines, triptans, and diclofenac potassium oral solution can be utilized no more than 10 days per month to avoid medication overuse (rebound) headache. It is also important to accurately ascertain the frequency and quantity of the patient’s acute headache medication use. Ideally, a blank monthly calendar should be utilized to maintain an accurate headache and medication calendar (*Headache Diary-Appendix 6.4*). For example, advise the patients to put the calendar in their bedroom or beside their toothbrush and fill out nightly, or utilize a notebook to record the information and then transfer to their monthly calendar.

It can be very challenging to determine whether an individual’s persistent post-traumatic headaches are secondary to the severity of their post-traumatic headache disorder or whether they are secondary to medication overuse (rebound) headache. In order to try to determine whether the individual’s headaches may, in fact, be perpetuated by the medication overuse (rebound), it is important to withdraw the individual from the offending medication(s) for a washout period of at least 6-8 weeks.¹ The ICHD-III criteria for Medication Overuse in Headache is presented in [Appendix 6.5](#). Prolonged passive treatment (i.e., many months) is generally not required.

Table 6.1. Important Components to Include in the Focused Headache History

1. Headache frequency
2. Headache duration
3. Headache location
4. Headache intensity
5. Quality of the pain (pressure, throbbing, stabbing)
6. Associated symptoms (e.g., nausea/vomiting)
7. Precipitating/provoking factors
8. Alleviating factors
9. Previous treatment experiences and responses to date (including benefits and side-effects)

RECOMMENDATIONS FOR ASSESSMENT OF POST-TRAUMATIC HEADACHE		
		GRADE
6.1	The primary care provider should take a focused headache history (see Table 6.1) in order to identify the headache subtype(s) that most closely resemble(s) the patient's symptoms. To aid in determining the specific phenotype of headache disorder present, refer to the ICHD-III Beta classification criteria in Appendix 6.3 . It should be noted that some post-traumatic headaches are currently unclassifiable.	B
6.2	Delayed brain imaging (Brain CT or MRI) should be considered when neurologic signs or symptoms are suggestive of possible intracranial pathology, progressive/worsening symptoms without any indications of other cause.	C
6.3	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. Markedly limiting or atypical symptoms should be considered for referral to an interdisciplinary concussion clinic, neurologist or headache clinic.	C
6.4	Primary care providers and healthcare professionals treating patient's headaches should perform a neurologic and musculoskeletal exam including cervical spine and vestibular examination (see Appendix 3.4).	B
RECOMMENDATIONS FOR NON-PHARMACOLOGICAL TREATMENT OF POST-TRAUMATIC HEADACHE		
		GRADE
6.5	Education should be provided on lifestyle strategies and simple, self-regulated intervention strategies that may minimize headache occurrence and/or decrease the impact of headaches when they occur. For more details on lifestyle management (see Appendix 6.6).	C
6.6	The treatment of headaches should be individualized and tailored to the clinical features and patient preferences. The treatment may include: <ol style="list-style-type: none"> Headache education including topics such as stimulus control, use of caffeine/tobacco/alcohol and other stimulants. Non-pharmacologic interventions such as sleep hygiene education, dietary modification, manual therapy and exercise, relaxation and modification of the environment. Pharmacologic interventions as appropriate both for acute pain and prevention of headache attacks.^a 	C
RECOMMENDATIONS FOR PHARMACOLOGICAL TREATMENT OF POST-TRAUMATIC HEADACHE		
		GRADE
6.7	All patients with frequent headaches should be strongly encouraged to maintain an accurate headache diary (see Appendix 6.5), medication calendar and activity log in order to accurately gauge symptoms and guide management.	C
6.8	Based upon the patient's headache characteristics, consideration may be given to using acute headache medications, limited to less than 15 days per month, including: <ol style="list-style-type: none"> Over-the-counter or prescription analgesics (e.g., acetaminophen, ibuprofen, Naproxen, acetylsalicylic acid (ASA)) Less than 10 days per month for combination analgesics (with codeine or caffeine) Triptan class medications (less than 10 days per month) 	C
6.9	For patients with post-traumatic headaches that are migrainous in nature, the use of migraine-specific abortants including diclofenac potassium oral solution and triptan class medications (i.e., Almotriptan, Eletriptan, Sumatriptan, Rizatriptan, Zolmitriptan, etc.) may be used if effective, but should be limited to fewer than 10 days per month due to risk of developing medication-induced headaches with more frequent use.	B
6.10	Narcotic analgesics should be avoided or restricted solely to "rescue therapy" for acute attacks when other first- and second-line therapies fail or are contraindicated.	C

a. Taken from the VA/DoD Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline (VA/DoD, 2016).

RECOMMENDATIONS FOR PHARMACOLOGICAL TREATMENT OF POST-TRAUMATIC HEADACHE CONTINUED

		GRADE
6.11	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 6.7).	B
6.12	Post-traumatic headaches may be unresponsive to conventional treatments. If headaches remain inadequately controlled, referral to a neurologist, pain management specialist, or interdisciplinary concussion clinic is recommended.	C

RESOURCES

APPENDICES

1	International Classification of Headache Disorders (ICHD-III) Beta: <u>Acute</u> Headache Attributed to Mild Traumatic Injury to the Head	Appendix 6.1
2	International Classification of Headache Disorders (ICHD-III) Beta: <u>Persistent</u> Headache Attributed to Mild Traumatic Injury to the Head	Appendix 6.2
3	Diagnostic Criteria for Selected Primary Headache Types from the International Classification of Headache Disorders (ICHD-III) Beta	Appendix 6.3
4	Headache Diary	Appendix 6.4
5	International Classification of Headache Disorders (ICHD-III) Beta: Medication-Overuse Headache	Appendix 6.5
6	Important Components to Include in the Neurological and Musculoskeletal Exam	Appendix 3.4
7	Self-Regulated Intervention and Lifestyle Strategies to Minimize Headache Occurrence	Appendix 6.6
8	Prophylactic Therapy	Appendix 6.7
9	Other Links/ Resources to consider	Appendix F

TABLES

1	Important Components to Include in the Focused Headache History	Table 6.1
---	---	-----------

ALGORITHMS

1	Assessment and Management of Post-Traumatic Headache following mTBI	Algorithm 6.1
---	---	---------------

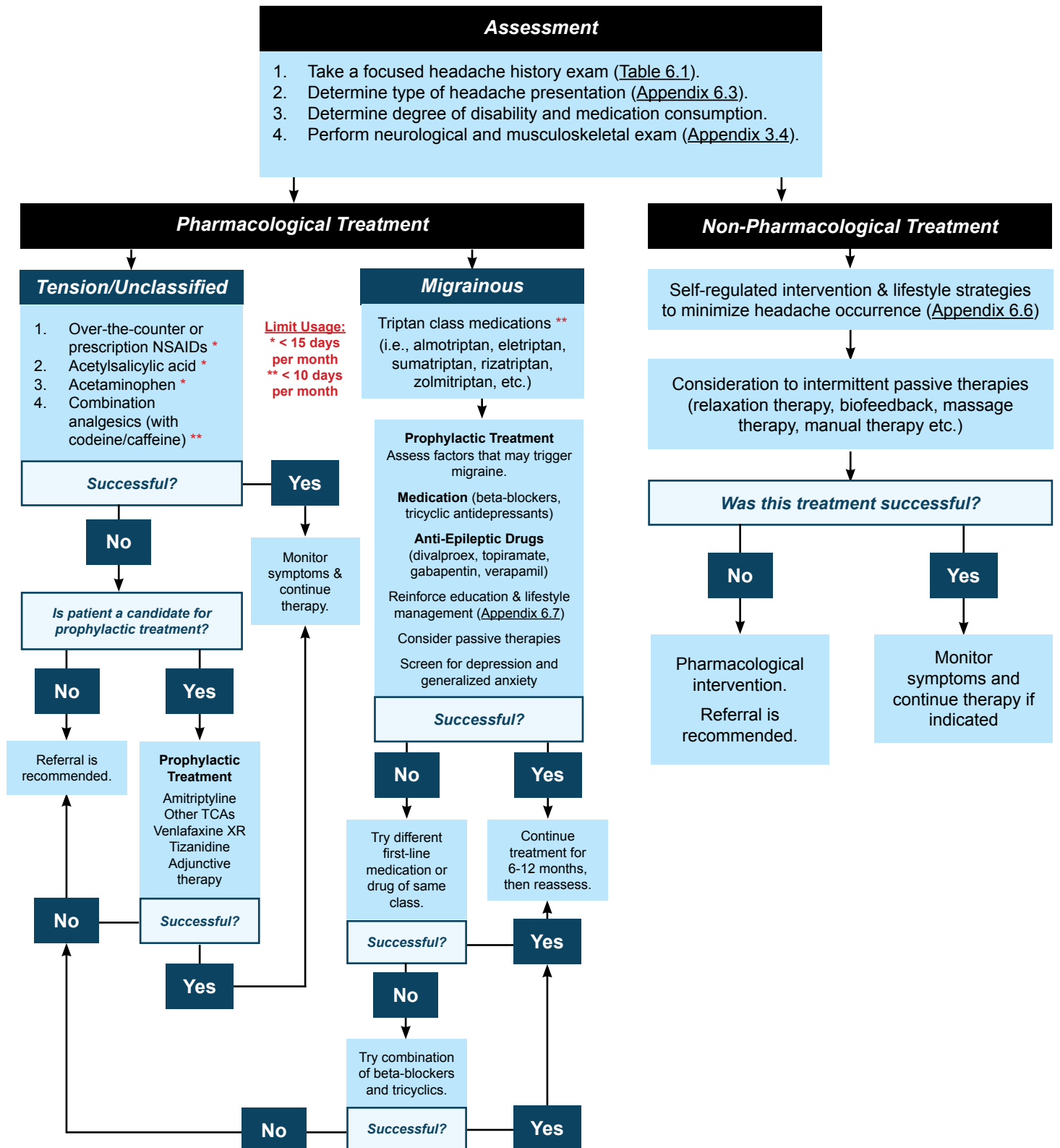
References

- Gladstone J. From psychoneurosis to ICHD-2: an overview of the state of the art in post-traumatic headache. *Headache*. 2009;49(7):1097-1111.
- Dikmen S, Machamer J, Fann JR, Temkin NR. Rates of symptom reporting following traumatic brain injury. *J Int Neuropsychol Soc*. 2010;16(3):401-411.
- Lew HL, Lin PH, Fuh JL, Wang SJ, Clark DJ, Walker WC. Characteristics and treatment of headache after traumatic brain injury: a focused review. *Am J Phys Med Rehabil*. 2006;85(7):619-627.
- Lew HL, Poole JH, Guillory SB, Salerno RM, Leskin G, Sigford B. Persistent problems after traumatic brain injury: The need for long-term follow-up and coordinated care. *J Rehabil Res Dev*. 2006;43(2):vii-x.
- Bazarian JJ, Wong T, Harris M, Leahey N, Mookerjee S, Dombrov M. Epidemiology and predictors of post-concussive syndrome after minor head injury in an emergency population. *Brain Inj*. 1999;13(3):173-189.
- Cartlidge NEF, Shaw DA. *Head Injury*. London: W.B. Saunders; 1981.
- Evans RW. The postconcussion syndrome: 130 years of controversy. *Semin Neurol*. 1994;14(1):32-39.
- Haas DC. Chronic post-traumatic headaches classified and compared with natural headaches. *Cephalalgia*. 1996;16(7):486-493.
- Jensen OK, Nielsen FF. The influence of sex and pre-traumatic headache on the incidence and severity of headache after head injury. *Cephalalgia*. 1990;10(6):285-293.
- Minderhoud JM, Boelens ME, Huizenga J, Saan RJ. Treatment of minor head injuries. *Clin Neurol Neurosurg*. 1980;82(2):127-140.
- Packard RC. Posttraumatic headache. *Semin Neurol*. 1994;14(1):40-45.
- Yamaguchi M. Incidence of headache and severity of head injury. *Headache*. 1992;32(9):427-431.
- Jamora CW, Young A, Ruff RM. Comparison of subjective cognitive complaints with neuropsychological tests in individuals with mild vs more severe traumatic brain injuries. *Brain Inj*. 2012;26(1):36-47.

14. Lucas S. Posttraumatic Headache: Clinical Characterization and Management. *Curr Pain Headache Rep.* 2015;19(10):48.
15. Theeler B, Lucas S, Riechers RG, Ruff RL. Post-traumatic headaches in civilians and military personnel: a comparative, clinical review. *Headache.* 2013;53(6):881-900.
16. Baandrup L, Jensen R. Chronic post-traumatic headache--a clinical analysis in relation to the International Headache Classification 2nd Edition. *Cephalalgia.* 2005;25(2):132-138.
17. Keidel M, Ramadan NM. Chronic Post-Traumatic Headache. In: Olesen J, Tfelt-Hansen P, Welch KMA, eds. *The Headaches.* 2nd Edition ed. Philadelphia: Lippincott, Williams & Wilkins; 2000:771-780.
18. Scher AI, Monteith TS. Epidemiology and classification of post-traumatic headache: what do we know and how do we move forward? Comment on Lucas et al., "Prevalence and characterization of headache following mild TBI". *Cephalalgia.* 2014;34(2):83-85.
19. (IHS) HCSotIHS. *The International Classification of Headache Disorders 3rd Edition (Beta version).* 2016; <https://www.ichd-3.org/>.
20. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med.* 2004;351(1):13-22.
21. Pietrzak RH, Johnson DC, Goldstein MB, Malley JC, Southwick SM. Posttraumatic stress disorder mediates the relationship between mild traumatic brain injury and health and psychosocial functioning in veterans of Operations Enduring Freedom and Iraqi Freedom. *J Nerv Ment Dis.* 2009;197(10):748-753.
22. Bettucci D, Aguggia M, Bolamperti L, Riccio A, Mutani R. Chronic post-traumatic headache associated with minor cranial trauma: a description of cephalalgic patterns. *Ital J Neurol Sci.* 1998;19(1):20-24.
23. Radanov BP, Di Stefano G, Augustiny KF. Symptomatic approach to posttraumatic headache and its possible implications for treatment. *Eur Spine J.* 2001;10(5):403-407.
24. Bekkelund SI, Salvesen R. Prevalence of head trauma in patients with difficult headache: the North Norway Headache Study. *Headache.* 2003;43(1):59-62.
25. Weiss HD, Stern BJ, Goldberg J. Post-traumatic migraine: chronic migraine precipitated by minor head or neck trauma. *Headache.* 1991;31(7):451-456.
26. Lucas S, Hoffman JM, Bell KR, Walker W, Dikmen S. Characterization of headache after traumatic brain injury. *Cephalalgia.* 2012;32(8):600-606.
27. Hoffman JM, Lucas S, Dikmen S, et al. Natural history of headache after traumatic brain injury. *J Neurotrauma.* 2011;28(9):1719-1725.

Algorithm 6.1

Assessment and Management of Post-Traumatic Headache Following mTBI



For a narrative description and guideline recommendations related to this algorithm, please refer to **Section 6**.