Guideline for Concussion/Mild Traumatic Brain Injury & Persistent Symptoms

Healthcare Professional Version

Third Edition

Adults (18+ years of age)

SECTION 6:
Post-Traumatic Headache

Ontario Neurotrauma Foundation
Fondation ontarienne de neurotraumatologie
The project team would like to acknowledge the Ontario Neurotrauma Foundation (ONF), who initiated and funded the development of the original guideline, as well as the current update. ONF is an applied health research organization with a focus on improving the quality of lives for people with an acquired brain injury or spinal cord injury, and on preventing neurotrauma injuries from occurring in the first place. ONF uses strategic research funding activity embedded within a knowledge mobilization and implementation framework to build capacity within systems of care. ONF works with numerous stakeholders and partners to achieve its objective of fostering, gathering and using research knowledge to improve care and quality of life for people who have sustained neurotrauma injuries, and to influence policy towards improved systems. The foundation receives its funding from the Ontario Government through the Ministry of Health and Long-Term Care.

Please note, the project team independently managed the development and production of the guideline and, thus, editorial independence is retained.

© Ontario Neurotrauma Foundation 2018

Ontario Neurotrauma Foundation
90 Eglinton East
Toronto, ON, Canada M4P 2Y3
Tel.: 1 (416) 422-2228
Fax: 1 (416) 422-1240
Email: info@onf.org

www.onf.org

Published May 2018
The recommendations and resources found within the Guideline for Concussion/mTBI & Persistent Symptoms are intended to inform and instruct care providers and other stakeholders who deliver services to adults who have sustained or are suspected of having sustained a concussion/mTBI (mild traumatic brain injury). This guideline is not intended for use with patients or clients under the age of 18 years. This guideline is not intended for use by people who have sustained or are suspected of having sustained a concussion/mTBI for any self-diagnosis or treatment. Patients may wish to bring their healthcare and other providers’ attention to this guideline.

The recommendations provided in this guideline are informed by best available evidence at the time of publication, and relevant evidence published after this guideline could influence the recommendations made within. Clinicians should also consider their own clinical judgement, patient preferences and contextual factors such as resource availability in clinical decision-making processes.

The developers, contributors and supporting partners shall not be liable for any damages, claims, liabilities, costs or obligations arising from the use or misuse of this material, including loss or damage arising from any claims made by a third party.
Headache is the most common and among the most prevalent persistent symptoms following mTBI.\textsuperscript{1,4} Studies to date have documented that anywhere from 30-90% of individuals who sustain a mTBI develop post-traumatic headache.\textsuperscript{2,5} Interestingly, several researchers have reported that post-traumatic headache is more common after concussion/mTBI than after severe TBI.\textsuperscript{5-17} Notably, post-traumatic headache is associated with a high degree of disability\textsuperscript{1} and is more chronic and persistent than previously thought.\textsuperscript{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)\textsuperscript{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).\textsuperscript{13} Comorbid conditions and psychological disorders such as post-traumatic stress disorder (PTSD) contribute to the complexity of managing post-traumatic headache.\textsuperscript{13,20,21} Accordingly, post-traumatic headache should not be treated as an isolated condition\textsuperscript{15} and the management of symptoms is based upon clinical experience and expert opinion.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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) |
### Section 6. Post-Traumatic Headache

#### Recommendations for Assessment of Post-Traumatic Headache

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>B</td>
</tr>
<tr>
<td>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.</td>
<td>C</td>
</tr>
<tr>
<td>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.</td>
<td>C</td>
</tr>
<tr>
<td>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).</td>
<td>B</td>
</tr>
</tbody>
</table>

#### Recommendations for Non-Pharmacological Treatment of Post-Traumatic Headache

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>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).</td>
<td>C</td>
</tr>
<tr>
<td>6.6 The treatment of headaches should be individualized and tailored to the clinical features and patient preferences. The treatment may include:</td>
<td></td>
</tr>
<tr>
<td>a. Headache education including topics such as stimulus control, use of caffeine/tobacco/alcohol and other stimulants.</td>
<td></td>
</tr>
<tr>
<td>b. Non-pharmacologic interventions such as sleep hygiene education, dietary modification, manual therapy and exercise, relaxation and modification of the environment.</td>
<td></td>
</tr>
<tr>
<td>c. Pharmacologic interventions as appropriate both for acute pain and prevention of headache attacks.</td>
<td>C</td>
</tr>
</tbody>
</table>

#### Recommendations for Pharmacological Treatment of Post-Traumatic Headache

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>C</td>
</tr>
<tr>
<td>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:</td>
<td></td>
</tr>
<tr>
<td>1. Over-the-counter or prescription analgesics (e.g., acetaminophen, ibuprofen, Naproxen, acetylsalicylic acid (ASA))</td>
<td></td>
</tr>
<tr>
<td>2. Less than 10 days per month for combination analgesics (with codeine or caffeine)</td>
<td></td>
</tr>
<tr>
<td>3. Triptan class medications (less than 10 days per month)</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>B</td>
</tr>
<tr>
<td>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.</td>
<td>C</td>
</tr>
</tbody>
</table>

---

### RECOMMENDATIONS FOR PHARMACOLOGICAL TREATMENT OF POST-TRAUMATIC HEADACHE CONTINUED

<table>
<thead>
<tr>
<th>Grade</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>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).</td>
</tr>
<tr>
<td>C</td>
<td>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.</td>
</tr>
</tbody>
</table>

### RESOURCES

#### APPENDICES

1. International Classification of Headache Disorders (ICHD-III) Beta: Acute Headache Attributed to Mild Traumatic Injury to the Head  
   Appendix 6.1
2. International Classification of Headache Disorders (ICHD-III) Beta: Persistent 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

Section 6. Post-Traumatic Headache

Algorithm 6.1
Assessment and Management of Post-Traumatic Headache Following mTBI

**Assessment**
1. Take a focused headache history exam (Table 6.1).
2. Determine type of headache presentation (Appendix 6.3).
3. Determine degree of disability and medication consumption.
4. Perform neurological and musculoskeletal exam (Appendix 3.4).

**Pharmacological Treatment**
- **Tension/Unclassified**
  1. Over-the-counter or prescription NSAIDs *
  2. Acetylsalicylic acid *
  3. Acetaminophen *
  4. Combination analgesics (with codeine/caffeine) **

  - **Successful?**
    - No: Is patient a candidate for prophylactic treatment?
      - No: Referral is recommended.
      - Yes: Prophylactic Treatment
        - Amitriptyline
        - Other TCAs
        - Venlafaxine XR
        - Tizanidine
        - Adjunctive therapy

  - **Successful?**
    - No: Try combination of beta-blockers and tricyclics.
    - Yes: No

  - Yes: Monitor symptoms & continue therapy.

- **Migrainous**
  1. Triptan class medications **
     (i.e., almotriptan, eletriptan, sumatriptan, rizatriptan, zolmitriptan, etc.)

  - **Successful?**
    - No: Prophylactic Treatment
      - Assess factors that may trigger migraine.
      - Medication (beta-blockers, tricyclic antidepressants)
      - Anti-Epileptic Drugs (divalproex, topiramate, gabapentin, verapamil)
      - Reinforce education & lifestyle management (Appendix 6.7)
      - Consider passive therapies
      - Screen for depression and generalized anxiety

  - **Successful?**
    - Yes: No
    - No: Continue treatment for 6-12 months, then reassess.

- **Non-Pharmacological Treatment**
  1. Self-regulated intervention & lifestyle strategies to minimize headache occurrence (Appendix 6.6)
  2. Consideration to intermittent passive therapies (relaxation therapy, biofeedback, massage therapy, manual therapy etc.)

  - **Was this treatment successful?**
    - No: Pharmacological intervention. Referral is recommended.
    - Yes: Monitor symptoms and continue therapy if indicated

For a narrative description and guideline recommendations related to this algorithm, please refer to Section 6.
5.1.2 Acute headache attributed to mild traumatic injury to the head

Diagnostic criteria:
A. Headache fulfilling criteria for 5.1 Acute headache attributed to traumatic injury to the head
B. Injury to the head fulfilling both of the following:

1. associated with none of the following:
   a) loss of consciousness for >30 min
   b) Glasgow Coma Scale (GCS) score <13
   c) post-traumatic amnesia lasting >24 hr
   d) altered level of awareness for >24 hr
   e) imaging evidence of a traumatic head injury such as intracranial haemorrhage and/or brain contusion

2. associated, immediately following the head injury, with one or more of the following symptoms and/or signs:
   a) transient confusion, disorientation or impaired consciousness
   b) loss of memory for events immediately before or after the head injury
   c) two or more other symptoms suggestive of mild traumatic brain injury: nausea, vomiting, visual disturbances, dizziness and/or vertigo, impaired memory and/or concentration.

Comment:
The diagnostic criteria for mild traumatic injury to the head and for moderate or severe traumatic injury to the head allow for substantial variability in the severity of head injury classified in each category. This has led some experts to suggest inclusion of additional categories: headache attributed to very mild traumatic injury to the head and headache attributed to very severe traumatic injury to the head. Although there is insufficient evidence for adding these categories at present, future studies should investigate the utility of doing so.
Appendix 6.2

International Classification of Headache Disorders, 3rd Edition (ICHD-III Beta): Persistent Headache Attributed to Traumatic injury to the Head

<table>
<thead>
<tr>
<th>IHS</th>
<th>Diagnosis</th>
<th>ICD-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.2</td>
<td>Persistent headache attributed to mild traumatic injury to the head</td>
<td>G44.31</td>
</tr>
</tbody>
</table>

5.2.2 Persistent headache attributed to mild traumatic injury to the head

**Diagnostic criteria:**
A. Headache fulfilling criteria for 5.2 Persistent headache attributed to traumatic injury to the head
B. Head injury fulfilling both of the following:

1. associated with none of the following:
   a) loss of consciousness for >30 min
   b) Glasgow Coma Scale (GCS) score <13
   c) post-traumatic amnesia lasting >24 hr
   d) altered level of awareness for >24 hr
   e) imaging evidence of a traumatic head injury such as intracranial haemorrhage and/or brain contusion

2. associated, immediately following the head injury, with one or more of the following symptoms and/or signs:
   a) transient confusion, disorientation or impaired consciousness
   b) loss of memory for events immediately before or after the head injury
   c) two or more other symptoms suggestive of mild traumatic brain injury: nausea, vomiting, visual disturbances, dizziness and/or vertigo, impaired memory and/or concentration.

**Comment:**
When headache following head injury becomes persistent, the possibility of 8.2 Medication-overuse headache needs to be considered.

Appendix 6.3

Diagnostic Criteria for Selected Primary Headache Types from the International Classification of Headache Disorders, 3rd Edition (ICHD-III Beta)

1.1 Migraine without aura

Previously used terms:
Common migraine; hemicrania simplex.

Description:
Recurrent headache disorder manifesting in attacks lasting 4-72 hours. Typical characteristics of the headache are unilateral location, pulsating quality, moderate or severe intensity, aggravation by routine physical activity and association with nausea and/or photophobia and phonophobia.

Diagnostic criteria:
A. At least five attacks fulfilling criteria B-D
B. Headache attacks lasting 4-72 hr (untreated or unsuccessfully treated)\(^2\,^3\)
C. Headache has at least two of the following four characteristics:
   1. unilateral location
   2. pulsating quality
   3. moderate or severe pain intensity
   4. aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)
D. During headache at least one of the following:
   1. nausea and/or vomiting
   2. photophobia and phonophobia
E. Not better accounted for by another ICHD-3 diagnosis.

Notes:
1. One or a few migraine attacks may be difficult to distinguish from symptomatic migraine-like attacks. Furthermore, the nature of a single or a few attacks may be difficult to understand. Therefore, at least five attacks are required. Individuals who otherwise meet criteria for 1.1 Migraine without aura but have had fewer than five attacks should be coded 1.5.1 Probable migraine without aura.
2. When the patient falls asleep during migraine and wakes up without it, duration of the attack is reckoned until the time of awakening.
3. In children and adolescents (aged under 18 years), attacks may last 2-72 hours (the evidence for untreated durations of less than two hours in children has not been substantiated).
2.2 Frequent episodic tension-type headache

**Description:**
Frequent episodes of headache, typically bilateral, pressing or tightening in quality and of mild to moderate intensity, lasting minutes to days. The pain does not worsen with routine physical activity and is not associated with nausea, but photophobia or phonophobia may be present.

**Diagnostic criteria:**
A. At least 10 episodes of headache occurring on 1-14 days per month on average for >3 months (≥12 and <180 days per year) and fulfilling criteria B-D
B. Lasting from 30 min to 7 days
C. At least two of the following four characteristics:
   1. bilateral location
   2. pressing or tightening (non-pulsating) quality
   3. mild or moderate intensity
   4. not aggravated by routine physical activity such as walking or climbing stairs
D. Both of the following:
   1. no nausea or vomiting
   2. no more than one of photophobia or phonophobia
E. Not better accounted for by another ICHD-3 diagnosis.

**Comments:**
2.2 Frequent episodic tension-type headache often coexists with 1.1 Migraine without aura. Coexisting tension-type headache in migraineurs should preferably be identified through use of a diagnostic headache diary. The treatment of migraine differs considerably from that of tension-type headache, and it is important to educate patients to distinguish between these headache types if they are to select the right treatment for each whilst avoiding medication overuse and its adverse consequence of 8.2 Medication-overuse headache.

When headache fulfils criteria for both 1.5 Probable migraine and 2. Tension-type headache, code as 2. Tension-type headache (or as any subtype of it for which the criteria are fulfilled) under the general rule that definite diagnoses always trump probable diagnoses. When headache fulfils criteria for both 1.5 Probable migraine and 2.4 Probable tension-type headache, code as the former under the general rule of hierarchy, which puts 1. Migraine and its subtypes before 2. Tension-type headache and its subtypes.

4.7 Primary stabbing headache

**Previously used terms:**
Ice-pick pains; jabs and jolts; needle-in-the-eye syndrome; ophthalmodynia periodica; sharp short-lived head pain.

**Description:**
Transient and localized stabs of pain in the head that occur spontaneously in the absence of organic disease of underlying structures or of the cranial nerves.

**Diagnostic criteria:**
A. Head pain occurring spontaneously as a single stab or series of stabs and fulfilling criteria B-D
B. Each stab lasts for up to a few seconds
C. Stabs recur with irregular frequency, from one to many per day
D. No cranial autonomic symptoms
E. Not better accounted for by another ICHD-3 diagnosis.
4.7 Primary stabbing headache involves extratrigeminal regions in 70% of cases. It may move from one area to another, in either the same or the opposite hemicranium: in only one third of patients it has a fixed location. When stabs are strictly localized to one area, structural changes at this site and in the distribution of the affected cranial nerve must be excluded.

A few patients have accompanying symptoms, but not including cranial autonomic symptoms. The latter help to differentiate 4.7 Primary stabbing headache from 3.3 Short-lasting unilateral neuralgiform headache attacks.

4.7 Primary stabbing headache is more commonly experienced by people with 1. Migraine, in which cases stabs tend to be localized to the site habitually affected by migraine headaches.

13.4 Occipital neuralgia

Description:
Unilateral or bilateral paroxysmal, shooting or stabbing pain in the posterior part of the scalp, in the distribution of the greater, lesser or third occipital nerves, sometimes accompanied by diminished sensation or dysesthesia in the affected area and commonly associated with tenderness over the involved nerve(s).

Diagnostic criteria:
A. Unilateral or bilateral pain fulfilling criteria B-E
B. Pain is located in the distribution of the greater, lesser and/or third occipital nerves
C. Pain has two of the following three characteristics:
   1. recurring in paroxysmal attacks lasting from a few seconds to minutes
   2. severe intensity
   3. shooting, stabbing or sharp in quality
D. Pain is associated with both of the following:
   1. dysesthesia and/or allodynia apparent during innocuous stimulation of the scalp and/or hair
   2. either or both of the following:
      a) tenderness over the affected nerve branches
      b) trigger points at the emergence of the greater occipital nerve or in the area of distribution of C2
E. Pain is eased temporarily by local anaesthetic block of the affected nerve
F. Not better accounted for by another ICHD-3 diagnosis.

Comments:
The pain of 13.4 Occipital neuralgia may reach the fronto-orbital area through trigeminocervical interneuronal connections in the trigeminal spinal nuclei.

13.4 Occipital neuralgia must be distinguished from occipital referral of pain arising from the atlantoaxial or upper zygapophyseal joints or from tender trigger points in neck muscles or their insertions.
## Appendix 6.4

### Headache Diary

A headache diary consists of tracking the following information:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time (start/finish)</th>
<th>Intensity rate 1-10 (most severe being 10)</th>
<th>Preceding Symptoms</th>
<th>Triggers</th>
<th>Medication (and dosage)</th>
<th>Relief (complete/moderate/none)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For more information about headache causes and treatments, visit the NHF web site at [www.headaches.org](http://www.headaches.org) or call 888-NHF-5552.
Previously used terms:
Rebound headache; drug-induced headache; medication-misuse headache.

Description:
Headache occurring on 15 or more days per month developing as a consequence of regular overuse of acute or symptomatic headache medication (on 10 or more or 15 or more days per month, depending on the medication) for more than three months. It usually, but not invariably, resolves after the overuse is stopped.

General comment:
In the criteria set out below for the various subtypes, the specified numbers of days of medication use considered to constitute overuse are based on expert opinion rather than on formal evidence.

Diagnostic criteria:
A. Headache occurring on ≥15 days per month in a patient with a pre-existing headache disorder
B. Regular overuse for >3 months of one or more drugs that can be taken for acute and/or symptomatic treatment of headache
C. Not better accounted for by another ICHD-3 diagnosis.

Note:
1. Patients should be coded for one or more subtypes of 8.2 Medication-overuse headache according to the specific medication(s) overused and the criteria for each below. For example, a patient who fulfils the criteria for 8.2.2 Triptan-overuse headache and the criteria for one of the subforms of 8.2.3 Simple analgesic-overuse headache should receive both these codes. The exception occurs when patients overuse combination-analgesic medications, who are coded 8.2.5 Combination-analgesic-overuse headache and not according to each constituent of the combination-analgesic medication.

Patients who use multiple drugs for acute or symptomatic treatment of headache may do so in a manner that constitutes overuse even though no individual drug or class of drug is overused; such patients should be coded 8.2.6 Medication-overuse headache attributed to multiple drug classes not individually overused.

Patients who are clearly overusing multiple drugs for acute or symptomatic treatment of headache but cannot give an adequate account of their names and/or quantities are coded 8.2.7 Medication-overuse headache attributed to unverified overuse of multiple drug classes until better information is available. In almost all cases, this necessitates diary follow-up.

Comments:
8.2 Medication-overuse headache is an interaction between a therapeutic agent used excessively and a susceptible patient. Among those with a previous primary headache diagnosis, most have 1. Migraine or 2. Tension-type headache (or both); only a small minority have other primary headache diagnoses such as 3.3 Chronic cluster headache or 4.10 New daily persistent headache.

The diagnosis of 8.2 Medication-overuse headache is extremely important clinically. Approximately half of people with headache on 15 or more days per month for more than three months have 8.2 Medication-overuse headache. Evidence shows that the majority of patients with this disorder improve after discontinuation of the overused medication, as does their responsiveness to preventative treatment. Simple advice on the causes and consequences of 8.2 Medication-overuse headache is an essential part of its management. An explanatory brochure is often all that is necessary to prevent or discontinue medication overuse. Prevention is especially important in patients prone to frequent headache.

However, the behaviour of some patients with 8.2 Medication-overuse headache is similar to that seen with other drug addictions, and the Severity of Dependence Scale (SDS) score is a significant predictor of medication overuse among headache patients.
Appendix 6.6

Self-Regulated Intervention and Lifestyle Strategies to Minimize Headache Occurrence

Simple Self-regulated Intervention Strategies*

- Apply a cold or hot pack to the neck or head
- Tie something tight around the head
- Stretching and self-massaging the head and/or neck and shoulders
- Perform breathing exercises
- Visualization or other mindfulness-based exercises
- Go to a quiet place
- Lie down
- Go outside to get fresh air

* Note. When relevant, there are a variety of allied-health professionals who can guide individuals to perform appropriate home-based neck and shoulder stretching.

Lifestyle Strategies to Minimize Headache Occurrence

a) **Sleep:** It is well-known that sleep deprivation or inconsistent sleep-wake cycles can precipitate headaches or preclude improvement. Accordingly, it is important to educate individuals with post-traumatic headache (PTH) on the importance of going to bed at the same time each night and waking up at the same time each night and, if possible, avoiding day-time naps. If insomnia continues to be a significant problem, please refer to section 7 for an approach to the management of insomnia.

b) **Regular Meals:** It is well-known that skipping or delaying meals can trigger headaches in some people. As such, it is important to ensure that patients with PTH consume breakfast (ideally a high-protein breakfast), lunch and dinner and avoiding delaying or skipping meals.

c) **Hydration:** It is thought that dehydration can be a trigger for headaches in some susceptible individuals. As such, it is important to maintain good hydration – this means consuming 4-6 drinks per day of water, juice, milk or other non-caffeinated beverages. Regular daily caffeine-consumption (i.e., coffee, soft-drinks) should be avoided as caffeine consumption and withdrawal can precipitate headaches (when an individual does not consume caffeinated beverages regularly, a caffeinated beverage may be helpful to minimize intermittent bad headaches). Diet soft-drinks should be further avoided as, in some, aspartame may trigger headaches.

d) **Stress:** It is well-known that in many individuals stress, worry, anxiety or anger can be a significant trigger for headaches. These symptoms are particularly common in individuals who have sustained a traumatic brain injury and, as such, can have a major impact on the frequency and severity of PTH. As such, using relaxation strategies, doing activities such as meditation, yoga, and exercise can assist with coping with stress and avoiding stress-induced worsening of headaches. The assistance of an occupational therapist, psychologist, GP-psychotherapist or psychiatrist may be necessary.

e) **Exercise:** In the initial period after a traumatic brain injury, physical rest is often endorsed. However, as the weeks go by, inactivity is frequently counter-productive and a sedentary lifestyle without any cardiovascular exercise may, in some, perpetuate the headaches. Accordingly, a brisk walk (particularly a morning walk outside), riding a stationary bicycle, walking or jogging on a treadmill or elliptical machine or swimming can be very helpful in headache management. An exercise program should be undertaken as tolerated with gradually increasing duration and intensity. For some, exercise triggers a headache and in these individuals the intensity and/or duration of the exercise should be reduced or an alternative exercise should be trialed.
Appendix 6.7

Prophylactic Therapy

Note that all therapies utilized for the prophylaxis of post-traumatic headaches are off-label. Prophylactic therapies should be utilized using a “start-low and go slow” approach. Patients should be advised that prophylactic therapies are not a cure and they may not perceive any benefit for weeks and maximal benefit may take up to 12 weeks to be realized. A therapeutic trial of a prophylactic therapy should last 12 weeks unless there are intolerable medication side-effects. The only useful way to evaluate the effectiveness of a prophylactic therapy is review of the patient’s headache and medication calendar. If the prophylactic therapy is efficacious, it should be continued for a minimum of 3-6+ months and then consideration could be given to gradually weaning off, if possible.

Patients must be advised of realistic goals with regards to prophylactic therapy – the goal is not to “cure” the individual’s headaches; rather, the goal is to try to decrease the individual’s headache frequency and/or headache intensity and/or headache duration and/or acute medication requirements. Patients should also be advised that there are no “designer” drugs for headache prophylaxis – all medications utilized were created for other reasons and were subsequently found to be effective in headache prophylaxis in some, but not all, patients. This will pre-empt unnecessary patient confusion and non-compliance.

If the headaches are tension-type in nature or unclassifiable, first-line therapy is Amitriptyline or Nortriptyline (starting at 10 mg po qhs and increasing by 10 mg q1-2 weeks as necessary/tolerated to a maximum of 50- (and occasionally up to 100 mg po qhs). Amitriptyline is more sedating than Nortriptyline so should be utilized if there are concomitant sleep disturbances. Second-line therapy to consider is Gabapentin (starting at 100-300 mg po qhs and increasing by 100-300 mg q5 days as necessary/tolerated on a TID schedule to a maximum of approximately 600 mg po TID).

From the Canadian Headache Society Guideline for Migraine Prophylaxis**

General Principles of Migraine Prophylaxis

When should Migraine Prophylaxis Be Considered? (Expert Consensus)

i. Migraine Prophylactic therapy should be considered in patients whose migraine attacks have a significant impact on their lives despite appropriate use of acute medications and trigger management/lifestyle modification strategies.

ii. Migraine prophylactic therapy should be considered when the frequency of migraine attacks is such that reliance on acute medications alone puts patients at risk for medication overuse (rebound) headache. Medication overuse is defined as use of opioids, combination analgesics, or triptans on ten days a month or more, or use of simple analgesics (acetaminophen, acetylsalicylic acid [ASA], non-steroidal anti-inflammatory drugs [NSAIDs]) on 15 days a month or more.

iii. Migraine prophylaxis should be considered for patients with greater than three moderate or severe headache days a month when acute medications are not reliably effective, and for patients with greater than eight headache days a month even when acute medications are optimally effective because of the risk of medication overuse headache.

iv. Migraine prophylaxis may be considered in some patients with relatively infrequent attacks according to patient preference and physician judgement, for example in patients with hemiplegic migraine.

v. Migraine prophylaxis may be particularly useful for patients with medical contraindications to acute migraine therapies.

When should Migraine Prophylactic Therpay Be Stopped? (Expert Consensus)

i. A prophylactic medication trial should consist of at least two months at the target or optimal dose (or at the maximum tolerated dose if the usual target dose is not tolerated) before a prophylactic drug is considered ineffective.

ii. A prophylactic medication is usually considered effective if migraine attack frequency or the number of days with headache per month is reduced by 50% or more, although lesser reductions in migraine frequency may be worthwhile, particularly if the drug is well tolerated.
iii. In addition to reduction in migraine attack frequency or in the number of days with headache per month, reductions in headache intensity and migraine-related disability need to be considered when judging the effectiveness of prophylactic therapy.

iv. Patients on migraine prophylaxis require periodic reevaluation both to monitor potential side effects and to assess efficacy.

v. Because of its utility in assessing the effectiveness of prophylactic therapy, patients should be strongly encouraged to keep a headache diary/calendar.

vi. After 6 to 12 months of successful prophylactic therapy, consideration should be given to tapering and discontinuing the prophylactic medication in many patients, although others may benefit from a much longer duration of prophylactic therapy. If headache frequency increases as the prophylactic drug dosage is reduced, the dosage can be increased again or the drug restarted if it has been discontinued.**

If the headaches are migrainous in nature:

a) First-line therapy would be a Tricyclic Antidepressant (i.e. Amitriptyline or Nortriptyline starting at 10 mg po qhs and increasing by 10 mg q1-2 weeks as necessary/tolerated to a maximum of 50-100 mg po qhs) or a beta-blocker (i.e. Nadolol starting at 20 mg po BID and increasing by 20 mg q5days as necessary/tolerated to 40-80 mg po BID or Propranolol 20 mg po TID and increasing by 20 mg q5days as necessary/tolerated to a maximum of 80 mg po TID).

b) Second-line therapy includes Topiramate (starting at 12.5 mg po qhs and increasing by 12.5 mg po qhs qweekly as necessary/tolerated to a maximum of 100 mg po qhs) or, failing this, Gabapentin (starting at 100-300 mg po qhs and increasing by 100-300 mg q5 days as necessary/tolerated on a TID schedule to a maximum of approximately 600 mg po TID).

c) Third-line therapies would include Verapamil (starting at 40 mg po TID and titrating to 80 mg po TID as necessary/tolerated), Pizotifen (starting at 0.5 mg po qhs and increasing by 0.5 mg qweekly as necessary/tolerated to 3.0 mg po qhs) and Flunarizine (starting at 5 mg po qhs and increasing to 10 mg po qhs after 10-14 days).

d) Notably, should trials of a couple oral prophylactic agents prove ineffective, or should oral prophylactic medications be contraindicated by concomitant medical issues or by significant polypharmacy, consideration could certainly be given to interventional therapy. Botulinum Toxin Type A (onabotulinum toxin) up to 200 units q3months using a fixed-dose, follow-the-pain treatment paradigm has proven beneficial in recent phase 3 RCT trials for the prophylaxis of chronic migraine and is an approved treatment for chronic migraine.

e) Nerve blocks (i.e. occipital nerve blocks) should be restricted to intractable daily post-traumatic headache and should be discontinued if the repetitive nerve blocks are ineffective after weekly treatment for 4-6 weeks.

The choice of prophylactic therapy depends on comorbid symptoms (i.e., consider Amitriptyline if concomitant insomnia, a Beta-blocker if concomitant hypertension, Topiramate if concomitant obesity) and contraindications (avoid Beta-blocker/Calcium-channel blocker if hypotensive, Tricyclic if excessive fatigue, Topiramate if excessive cognitive symptoms, Flunarizine if depression etc).