

Management of Headache Following Concussion/Mild Traumatic Brain Injury: Guidance for Primary Care Management in Deployed and Non-Deployed Settings



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1:00 – 2:30 p.m. (ET)

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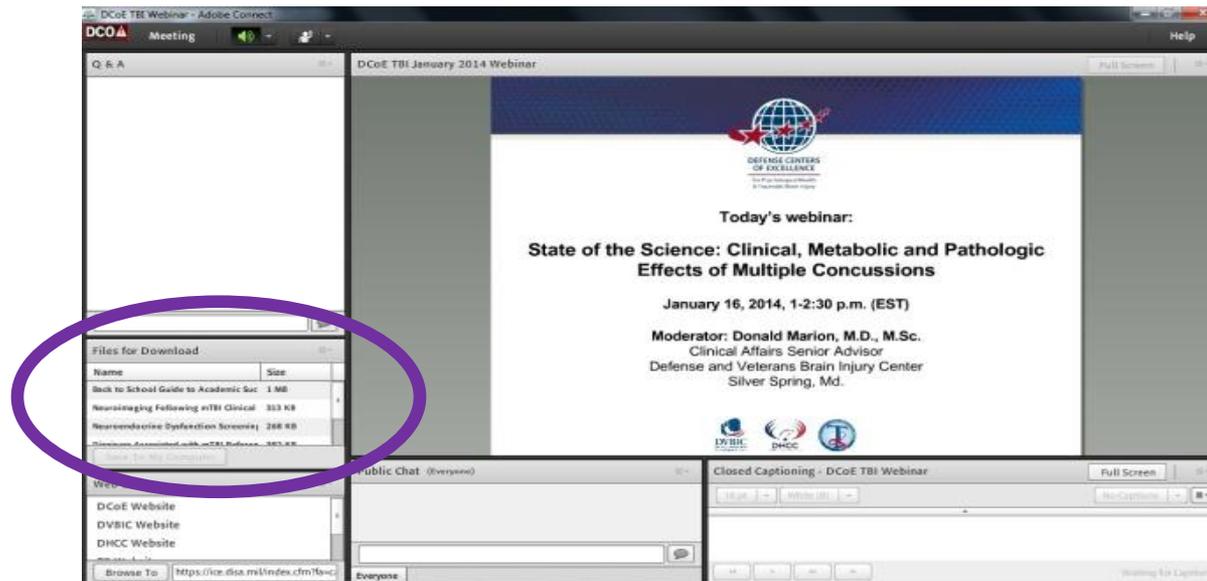


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Resources Available for Download



Today's presentation and resources are available for download in the "Files" box on the screen, or visit dvbic.dcoe.mil/webinars



"Medically Ready Force...Ready Medical Force"

Downloadable Resources



■ Today's resources include:

- Management of Headache Following Concussion/Mild Traumatic Brain Injury: Guidance for Primary Care Management in Deployed and Non-Deployed Settings Clinical Recommendation
- Companion Clinical Support Tool
- Provider Training Slides
- Managing Headaches patient education Fact Sheet

Webinar Details



- Live closed captioning is available through Federal Relay Conference Captioning (see the “Closed Captioning” box)
- Webinar audio is not provided through Adobe Connect or Defense Connect Online
 - Dial: CONUS **888-455-0936**
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 - Use participant pass code: **1825070**
- Question-and-answer (Q&A) session
- Submit questions via the Q&A box

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Continuing Education Details



- DCoE’s awarding of continuing education (CE) credit is limited in scope to health care providers who actively provide psychological health and traumatic brain injury care to active-duty U.S. service members, reservists, National Guardsmen, military veterans and/or their families.
- The authority for training of contractors is at the discretion of the chief contracting official.
 - Currently, only those contractors with scope of work or with commensurate contract language are permitted in this training.

Continuing Education Accreditation



- This continuing education activity is provided through collaboration between DCoE and Professional Education Services Group (PESG).
- Credit Designations include:
 - 1.5 AMA PRA Category 1 credits
 - 1.5 ACCME Non Physician CME credits
 - 1.5 ANCC Nursing contact hours
 - 1.5 CRCC
 - 1.5 APA Division 22 contact hours
 - 0.15 ASHA Intermediate level, Professional area
 - 1.5 CCM hours
 - 1.5 AANP contact hours
 - 1.5 AAPA Category 1 CME credit
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Continuing Education Accreditation

continued



Physicians

This activity has been planned and implemented in accordance with the essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME). Professional Education Services Group is accredited by the ACCME as a provider of continuing medical education for physicians. This activity has been approved for a maximum of 1.5 hours of *AMA PRA Category 1 Credits*™. Physicians should only claim credit to the extent of their participation.

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Physical Therapists

Physical Therapists will be provided a certificate of participation for educational activities certified for AMA PRA Category 1 Credit™. Physical Therapists may receive a maximum of 1.5 hours for completing this live program.

Continuing Education Accreditation

continued 2



Psychologists

This Conference is approved for up to 1.5 hours of continuing education. APA Division 22 (Rehabilitation Psychology) is approved by the American Psychological Association to sponsor continuing education for psychologists. APA Division 22 maintains responsibility for this program and its content.

Physical Therapists

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Psychologists

This Conference is approved for up to 1.5 hours of continuing education. APA Division 22 (Rehabilitation Psychology) is approved by the American Psychological Association to sponsor continuing education for psychologists. APA Division 22 maintains responsibility for this program and its content.

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The Commission on Rehabilitation Counselor Certification (CRCC) has pre-approved this activity for 1.5 clock hours of continuing education credit.

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Continuing Education Accreditation

continued 3



Case Managers

This program has been pre-approved by The Commission for Case Manager Certification to provide continuing education credit to CCM® board certified case managers. The course is approved for up to 1.5 clock hours. PESG will also make available a General Participation Certificate to all other attendees completing the program evaluation.

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Other professionals participating in this activity may obtain a General Participation Certificate indicating participation and the number of hours of continuing education credit.

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- Throughout the webinar, you are welcome to submit technical or content-related questions via the Q&A pod located on the screen. **Please do not submit technical or content-related questions via the chat pod.**
- The Q&A pod is monitored during the webinar; questions will be forwarded to presenters for response during the Q&A session.
- Participants may chat with one another during the webinar using the chat pod.
- The chat function will remain open 10 minutes after the conclusion of the webinar.

Webinar Overview



More than 339,000 service members sustained a traumatic brain injury (TBI) between 2000 and 2015 with approximately 82 percent of these classified as mild TBI (mTBI), also known as concussion (Defense and Veterans Brain Injury Center, 2016).

Headache is the most common symptom reported following a concussion (Lucas, Hoffman, Bell, & Dikmen, 2014). In a study of Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans, 74 percent reported post-traumatic headaches (PTH) occurring within 30 days of sustaining a concussion (Theeler, Flynn, & Erickson, 2010).

Webinar Overview

continued



The presentation will review the newly released Clinical Recommendation (CR) which offers guidance for the primary care management of PTH in deployed and non-deployed settings. The speakers will address the characteristics of four of the most common types of PTH and review non-pharmacologic and pharmacologic treatment recommendations for each type. In addition, they will address when specialty referral may be indicated. Practical resources, including the CR, companion Clinical Support Tool, Provider Training Slides, and patient education materials, are available for download.

Defense and Veterans Brain Injury Center. (2016). DoD Numbers for Traumatic Brain Injury Worldwide - Totals. Retrieved from <http://dvbic.dcoe.mil/dod-worldwide-numbers-tbi>

Lucas, S., Hoffman, J., Bell, K., & Dikmen, S. (2014). A prospective study of prevalence and characterization of headache following mild traumatic brain injury. *Cephalalgia*, 34(2), 93–102.

Theeler, B. J., Flynn, F. G., & Erickson, J. C. (2010). Headaches after concussion in U.S. soldiers returning from Iraq or Afghanistan. *Headache: The Journal of Head and Face Pain*, 50(8), 1262-1272

Webinar Overview

continued 2



At the conclusion of this webinar, participants will be able to:

- Articulate risk factors associated with PTH
- Describe and distinguish among the common types of PTH
- Employ the CR to assess, diagnose and treat each type of PTH

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Management of Headache Following Concussion/Mild TBI: Guidance for Primary Care Management in Deployed and Non-Deployed Settings

Ronald Riechers, II, M.D.

(Department of Defense (DoD)/Defense and Veterans Brain Injury Center (DVBIC), 2016)

Disclosure – Dr. Reichers



- Dr. Reichers has no financial relationship to disclose.
- The views expressed in this presentation are those of the author and do not necessarily reflect the official policy or position of the Department of Defense, nor the U.S. Government.
- The description of programs in this presentation is for descriptive purposes only and not intended to promote any individual program.

Polling Question 1



My primary discipline is:

- a. Primary care provider
- b. Rehabilitation provider
- c. Behavioral health provider
- d. Nurse
- e. Social worker/case manager
- f. Other

Polling Question 2



Please rate your comfort with treating post-traumatic headache.

- a. Very comfortable
- b. Comfortable
- c. Somewhat comfortable
- d. Not comfortable
- e. N/A

Polling Question 3



Where do you seek headache diagnosis and treatment information to use in your practice?

- a. Peers
- b. Medical journals
- c. Professional organizations, e.g., American Academy of Neurology, International Headache Society, National Headache Foundation
- d. Websites
- e. N/A

Defense Department TBI Statistics



DoD Numbers for Traumatic Brain Injury Worldwide – Totals

2000-2015 Q1-Q3

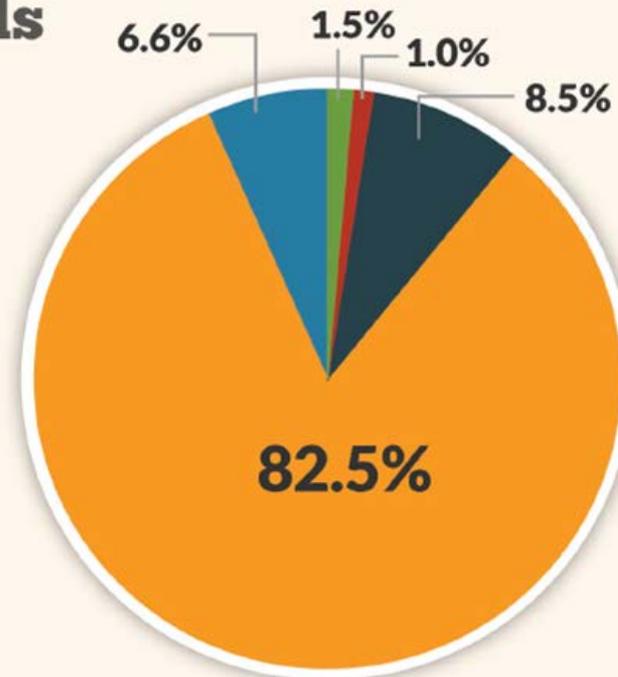
■ Penetrating	4,944
■ Severe	3,502
■ Moderate	28,701
■ Mild	279,898
■ Not Classifiable	22,417

Total - All Severities 339,462

Source: Defense Medical Surveillance System (DMSS), Theater Medical Data Store (TMDS) provided by the Armed Forces Health Surveillance Center (AFHSC)

Prepared by the Defense and Veterans Brain Injury Center (DVBIC)

**Percentages do not add up to 100% due to rounding*



2000-2015 Q1-Q3, as of Dec 08, 2015

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Purpose and Scope of Clinical Recommendation



- Headache is the most common symptom reported following a concussion.
- 74 percent of an OEF/OIF cohort reported PTH that occurred within 30 days of sustaining a concussion.
- These recommendations were developed to provide comprehensive guidance for acute, sub-acute and persistent PTH.

(DoD/DVBIC, 2016)

Purpose and Scope of Clinical Recommendation continued



- The CR development followed a process that included evidence reviews, an analysis of the applicability of current clinical practice guidelines, and input from a multidisciplinary expert panel.
- Service-specific requirements regarding concussion or the management of PTH may exist.
- Provider judgment and operational requirements supersede any of these recommendations for an individual patient.

PTH



- PTH may occur from injury not only to the head but also to the neck or face.
- The diagnosis of PTH is largely dependent on the close temporal relationship between the injury and headache onset.
- PTH is classified as acute (<3 months) or persistent (>3 months) based upon duration of headache.

(DoD/DVBIC, 2016)

Risk Factors for PTH



- The most common risk factors for the development of PTH include:
 - Premorbid history of headache
 - Female gender
 - Presence of comorbid psychiatric disorders

(DoD/DVBIC, 2016)

Risk Factors for PTH continued



- Research suggests other risk factors include:
 - Patient's expectation of developing a headache after head injury
 - Sleep disturbances
 - Mood disturbances
 - Psychosocial stressors
 - Overuse of abortive headache medications

(DoD/DVBIC, 2016)

PTH Types



- Differentiation of headache type is important for optimal treatment. With a thorough history and review of systems, the characteristics of the specific type will emerge.
- Four of the most common types of PTH following concussion are:
 - Migraine
 - Tension type
 - Cervicogenic
 - Headache related to neuropathic pain

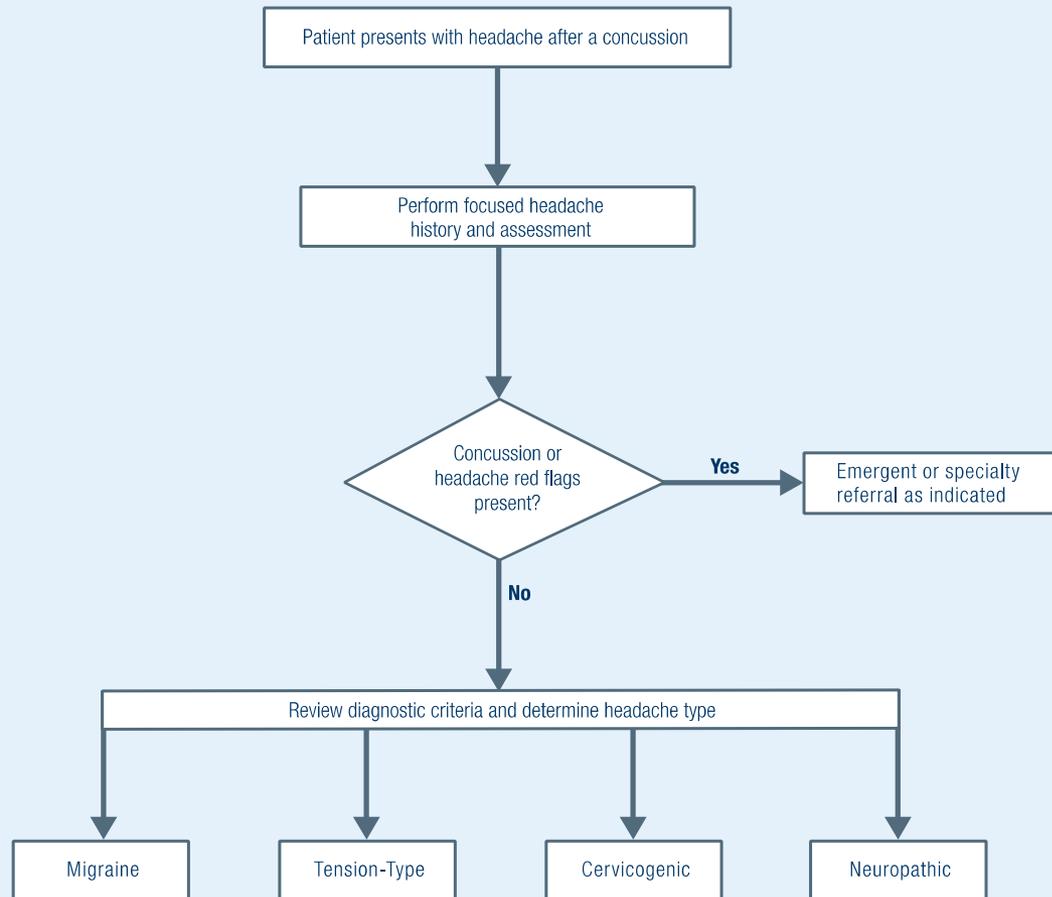
(DoD/DVBIC, 2016)

■ For all types of PTH:

- ❑ In addition to managing headache symptoms, providers should follow both the Concussion Management Algorithm (CMA) and Progressive Return to Activity for Primary Care Manager CR if in the acute phase (available at dvbic.dcoe.mil).
 - Physical and cognitive rest are important for healing and symptom resolution.
- ❑ Avoid benzodiazepines, tramadol, opiates.

(DoD/DVBIC, 2016)

PTH Evaluation & Treatment Algorithm

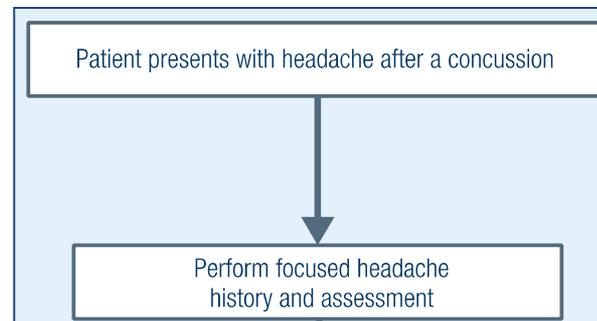


Beginning the Algorithm

- Primary care providers should evaluate whether concussion/mild TBI is a possible cause for any headache.

Remember:

- PTH typically starts within 30 days of head injury.
- If prior history of headaches, the TBI could exacerbate headache frequency/severity.
- Patients with PTH may not present to the medical provider for treatment until long after the headache starts.



(DoD/DVBIC, 2016)

Knowledge Check Question 1



Which of the following is a “red flag” and should prompt an immediate evaluation?

- a. Any headache even though it is improving
- b. Slurred speech
- c. Double vision
- d. Disorientation
- e. All of the above
- f. b, c and d only

Knowledge Check Question 1 Answer



Correct answer: f. b, c, and d only

Slurred speech

Double vision

Disorientation

Perform Focused PTH History & Exam

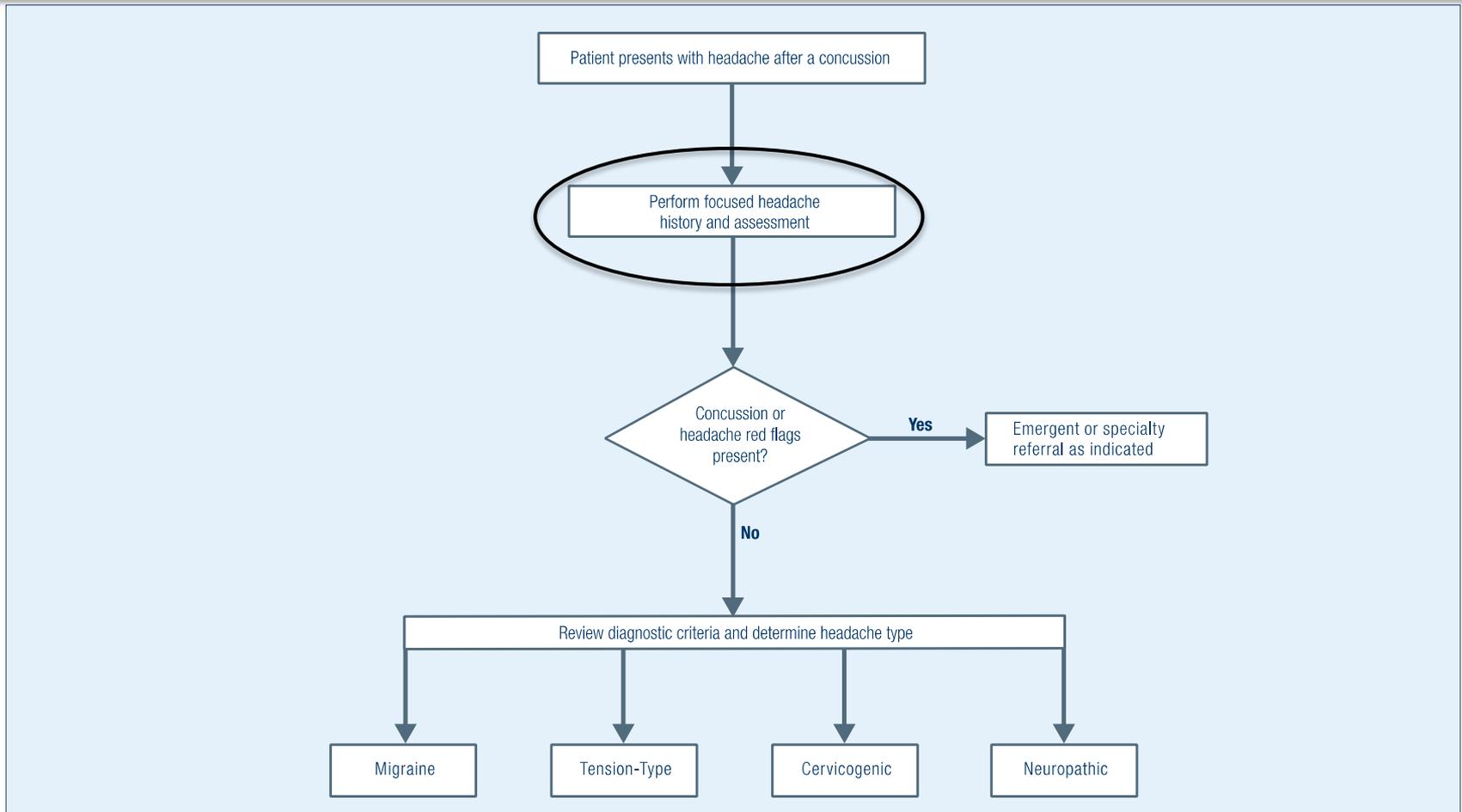


Table 1.0 (tables correspond to CR)

Focused Headache History



Assessment area	Examples of questions and information to collect
Symptoms	<ul style="list-style-type: none"> Persistent pain in head or neck after a concussion (Use of 0-10 scale is recommended, 1= barely present, 5= pain beginning to interfere with activity, and 10= worst imaginable pain)
Location	<ul style="list-style-type: none"> Right or left sided Bilateral vs. unilateral Face Stays in one place or moves around (radiates) Back or on top Forehead Neck
Description of pain	<ul style="list-style-type: none"> Throbbing/pulsating Pressing/squeezing Stabbing, sharp, or dull/nagging Pain with chewing or opening mouth Head, face or neck tenderness Decreased jaw movement
Frequency and duration	<ul style="list-style-type: none"> Episodic or continuous Seconds, minutes, hours, days or constant
Associated physical symptoms	<ul style="list-style-type: none"> Vision changes (blindness, blurry vision, double vision, eyelid droop, tearing, eye redness or puffiness) Light, noise and odor sensitivity, nose blockage/discharge Nausea, loss of appetite, hunger, bowel changes Premonitory symptoms (fatigue, difficulty concentrating) Neck stiffness or pain Yawning Pallor Auras (visual, sensory or dysphasic speech disturbances) Numbness or tingling around lips, arms or legs

Table 1.0

Focused Headache History continued



Assessment area	Examples of questions and information to collect	
Headache history	<ul style="list-style-type: none"> • Previous headache diagnosis • Worsening headache • Previous head trauma or TBI 	<ul style="list-style-type: none"> • History of temporal mandibular joint (TMJ) pain • Family history
Triggers	<ul style="list-style-type: none"> • Sleep (too much or too little) • Physical activity • Straining or coughing • Missed meal • Food • Pregnancy • Caffeine • Muscle tension 	<ul style="list-style-type: none"> • Emotional stress (during or after) • Bending over • Sexual activity • Change in weather • Alcohol • Menstrual cycle • Contraceptives
Social history	<ul style="list-style-type: none"> • Headache interferes with family, work or school • Substance use or abuse (caffeine, alcohol, tobacco), supplement use (vitamins, etc.) 	
Medication history	<ul style="list-style-type: none"> • Previous medications used for headache prevention and rescue <ul style="list-style-type: none"> - Dosage, frequency and duration - Failed medications • Current medications, how often taking rescue or preventative medications 	
Comorbid conditions	<ul style="list-style-type: none"> • Insomnia, depression, anxiety, obstructive sleep apnea 	
Questionnaires	<ul style="list-style-type: none"> • Patient Health Questionnaire (PHQ), Neurobehavioral Symptom Inventory (NSU), Patient Global Impression of Change (PGIC), Headache Impact Test-6 (HIT) 	

Table 2.0

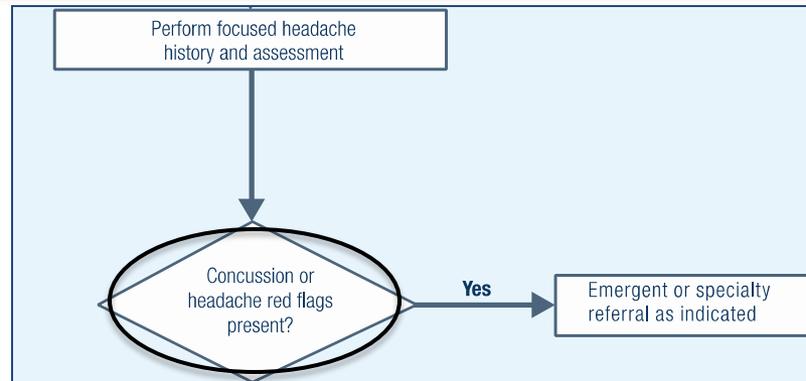
Focused Headache Examination



Assessment area	Examples
Head, neck and face	<ul style="list-style-type: none"> • Cranial nerve examination • Neck range of motion • Palpation of head and neck for trigger points or tenderness • Evaluate for papilledema
Ears, nose and throat	<ul style="list-style-type: none"> • Examine the ears, nares • Palpitate the face and percuss sinuses • Temporal mandibular joint (TMJ) examination
Other neurological examination	<ul style="list-style-type: none"> • Reflexes • Sensory testing • Romberg testing • Pronator drift • Strength testing
Mental status	<ul style="list-style-type: none"> • Speech fluency • Word recall

Table 3.0

Concussion Red Flags



Red flags that indicate emergency referral

1. Progressively declining level of consciousness	8. Repeated vomiting
2. Loss of consciousness (LOC) > 5 minutes	9. Worsening headache
3. Declining neurological status	10. Pupil asymmetry
4. GCS score < 15	11. Double vision
5. Seizures	12. Slurred speech
6. Neurological deficit: motor or sensory	13. Unusual behavior
7. Cannot recognize people or disoriented to place	

Table 4.0 Headache Red Flags and Indications for Referral



Red flags specific for headaches	
Indications for emergency referral	Indications for specialty referral
Concussion red flags	Presence of systemic symptoms
Thunderclap headache (sudden onset)	Associated neurological symptoms
Sudden neurological deficit	Onset after age 50*
Persistent bleeding from nose, ears or scalp	Change in pattern of headache
Cranial fracture	Valsalva precipitation
Infection resulting from a penetrating injury	Postural aggravation
Cerebrospinal fluid leakage (nose or ears)	TMJ disorder
Intracranial hemorrhage on CT	ENT disorder
Papilledema	Anticoagulant therapy*
<p>* Patients on anticoagulant therapy or over the age of 50 have an increased risk of chronic subdural hematoma. This demographic may need imaging with or without specialty referral based on the head trauma history and provider judgment. Refer to the <i>DVBIC CR Neuroimaging Following Mild Traumatic Brain Injury: Guidance in the Non-Deployed Setting</i> that is available at dvbic.dcoe.mil.</p>	

Table 5.0

Characteristics of Headache Types



	Migraine	Tension type	Cervicogenic	Related to neuropathic pain	Medication overuse
Aura	Possible (15-33%)	No	No	No	No
Duration	4-72 hours	30 minutes to 7 days	Some or all of the day	Seconds, minutes, hours	Some or all of the day
Frequency	Episodic, variable	1-15 days/ month, variable	Variable	Episodic, variable	Daily > 15 days each month
Site	Unilateral	Bilateral	Usually unilateral	Unilateral	Unilateral or bilateral
Pain characteristics	Pulsating	Pressure/ tightening	Tightening and/or burning	Burning, radiating	Pressing, tightening, pulsating
Pain severity	Moderate/severe	Mild/moderate	Mild/moderate	Moderate/severe	Mild/moderate/severe
Aggravated by movement?	Yes	No	Yes with head movement	Yes	No
Nausea/ vomiting	Yes	No	No	No	No
Photophobia/ phonophobia?	Yes	No	No	No	No

*PCM should consider the possibility of medication overuse headache (MOH) when criteria in Table 5.0 are present. Optimal treatment consists of discontinuation of the offending medications, acute treatment of withdrawal symptoms and pain, and use of analgesic medication as preventative treatment only when necessary.

Migraine Headache



- Migraines are the most common type of PTH.
- International Classification of Headache Disorders-3 (beta version) provides two major subtypes for migraines.
 - With aura
 - Without aura
- Treatment is the same for both subtypes.

(DoD/DVBIC, 2016)

Table 6.0 Migraine Headache Description



ICD-9-CM: 346.10 (without aura)

ICD-10-CM: G43.009

ICD-9-CM: 346.00 (with aura)

ICD-10-CM: G43.109

Description:*

- A. Headache attacks lasting 4-72 hours (untreated or unsuccessfully treated)
- B. Headache has at least two of the following characteristics:
 - 1. Unilateral location
 - 2. Pulsating quality
 - 3. Moderate or severe pain intensity
 - 4. Aggravation by, or causing avoidance of, routine activity (e.g., walking or climbing stairs)
- C. During headache at least one of the following:
 - 1. Nausea and/or vomiting
 - 2. Photophobia or phonophobia
- D. May or may not be accompanied by an aura (present in 15-33 percent of patients). Most common auras are visual, other sensory, motor or speech and language

* Modified from: International Headache Society. (2013). The International Classification of Headache Disorders, 3rd edition (beta version), *Cephalalgia*, 33(9) 629-808.

Table 6.0 Migraine Headache Pharmacologic Treatment



Acute/Abortive Agents

Mild/moderate: Acetaminophen; NSAIDs[§] (ibuprofen, naproxen, >48 hours following concussion)
Severe: Triptans (e.g., sumatriptan, rizatriptan, zolmitriptan); dihydroergotamine (DHE) nasal spray^{§§} (pre-treat with antiemetic) Ketorolsac nasal spray^{§§} or IM

Preventive Treatment

First Line: Tricyclic antidepressants (TCA) (e.g., amitriptyline, nortriptyline); antiepileptics (e.g., topiramate, valproate^{§§}); beta blockers (e.g., metoprolol)
Second Line: Serotonin norepinephrine reuptake inhibitors (SNRI) (e.g., venlafexine); onabotulinumA^{§§} (Botox); (referral recommended)

[§] Recent U.S. Food and Drug Administration Agency (FDA) warning cautions that NSAIDs can increase the risk of heart attack, heart failure, or stroke in patients with or without pre-existing heart disease, or risk factors for heart disease, even during the first few weeks of treatment, though the risk appears highest with longer use at higher doses. Detailed information on this topic is located at <http://www.fda.gov/Drugs/DrugSafety/ucm451800.htm>

^{§§} These medications are not currently available in the deployed formulary; onabotulinumA is FDA approved for treatment of migraine headaches.

Tension-Type Headache Assessment and Diagnosis



- Increased scalp palpation tenderness is the most significant abnormal finding in patients with tension-type headache.
- Tenderness can be elicited by small rotating movements and a firm pressure over the head and neck muscles.
- Tenderness is typically present between headaches.

(DoD/DVBIC, 2016)

Table 7.0 Tension-Type Headache Description



ICD-9-CM: 339.1

ICD-10-CM: G44.209

Description:*

- A. Episodes of headache, typically bilateral, pressing or tightening in quality, of mild to moderate intensity, lasting minutes to days
- B. Pain does not worsen with routine physical activity and is not associated with nausea, but photophobia or phonophobia may be present
- C. Occurring for 1-15 days per month.

* Modified from: International Headache Society. (2013). The International Classification of Headache Disorders, 3rd edition (beta version). *Cephalalgia*, 33(9), 629-808.

Table 7.0 Tension-Type Headache Non-Pharmacologic Treatment



Education on lifestyle changes

(headache management fact sheet available at dvbic.dcoe.mil)

- | | |
|--|--|
| <ul style="list-style-type: none">▪ Sleep hygiene▪ Exercise▪ Hydration▪ Progressive return to activity▪ Caffeine intake▪ Physical therapy | <ul style="list-style-type: none">▪ Stress management▪ Acupuncture▪ Relaxation training▪ Cognitive behavioral therapy (CBT)▪ Biofeedback▪ Massage |
|--|--|

* Nicholson, R. A., Buse, D. C., Andrasik, F., & Lipton, R. B. (2011, February). Nonpharmacologic treatments for migraine and tension-type headache: how to choose and when to use. *Current Treatment Options in Neurology*, 13(1), 28-40. Penzien, D. B., & Taylor, F. R. (2014, May). Headache toolbox. Behavioral and other nonpharmacologic treatments for headache. *Headache*, 54(5), 955-6.

Campbell, J. K., Penzien, D. B., Wall, E. M., & the U.S. Headache Consortium. (2009). Evidenced-Based Guidelines for Migraine Headache: Behavioral and Physical Treatments. Retrieved from: <http://tools.aan.com/professionals/practice/pdfs/gl0089.pdf>. Bell, K. R., Hoffman, J., & Watanabe, H. (2014, April). Headaches after traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*, 95(4), 793-4.

Table 7.0 Tension-Type Headache Pharmacologic Treatment



Acute/Abortive Agents

First line: Acetaminophen; NSAIDs[§]

Second Line: Acetaminophen/caffeine compounds

Preventive Treatment

Selective serotonin reuptake inhibitors (SSRI) (e.g., paroxetine, citalopram);
Serotonin norepinephrine reuptake inhibitors (SNRI) (e.g., venlafaxine);
tricyclic antidepressants (TCA) (e.g., amitriptyline, nortriptyline);); tetracyclic
antidepressants (e.g., mirtazapine)

[§]U.S. Food and Drug Administration Agency (FDA) warning cautions that NSAIDs can increase the risk of heart attack, heart failure, or stroke in patients with or without pre-existing heart disease, or risk factors for heart disease, even during the first few weeks of treatment, though the risk appears highest with longer use at higher doses. Detailed information on this topic is located at <http://www.fda.gov/Drugs/DrugSafety/ucm451800.htm>

Knowledge Check Question 2



Which of the following interventions is NOT considered a reasonable first-line intervention for acute tension-type headache?

- a. Acetaminophen
- b. Sleep hygiene education
- c. Naproxen
- d. Tramadol

Knowledge Check Question 2 Answer



Answer: d. Tramadol.

Tramadol, benzodiazepines and narcotics should be avoided after TBI.

Table 8.0 Cervicogenic Headache Description



ICD-9-CM: 732.2

ICD-10-CM: G44.841

Description:*

- A. Headache caused by a disorder of the cervical spine or soft tissue of the neck. Usually, but not always, associated neck pain
- B. Headache has developed on temporal relation the head trauma
- C. Cervical range of motion is reduced
- D. Headache is made significantly worse by neck movement

* Modified from: International Headache Society. (2013). The International Classification of Headache Disorders 3rd edition (beta version). *Cephalalgia*, 33(9), 629-808.

Cervicogenic Headache

Physical Exam



■ Physical exam findings may include:

- Reduced cervical range of motion
- Headache pain – unilateral
- Provocation of headache by digital pressure on neck muscles
- Posterior to anterior radiation of pain with head movement (Headache Classification Committee of the International Headache Society, 2013)

(DoD/DVBIC, 2016)

Table 8.0 Cervicogenic Headache Treatment



Acute/Abortive Agents

First Line: NSAIDs[§]

Second Line: Muscle relaxants if cervical spasms; trigger point injection (referral recommended)

Preventive Treatment

Antiepileptics (e.g., gabapentin, topiramate); tricyclic antidepressants (TCA) (e.g., amitriptyline, nortriptyline); serotonin norepinephrine reuptake inhibitors (SNRI) (e.g., venlafexine)

[§]U.S. Food and Drug Administration Agency (FDA) warning cautions that NSAIDs can increase the risk of heart attack, heart failure, or stroke in patients with or without pre-existing heart disease, or risk factors for heart disease, even during the first few weeks of treatment, though the risk appears highest with longer use at higher doses. Detailed information on this topic is located at <http://www.fda.gov/Drugs/DrugSafety/ucm451800.htm>

Headache Related to Neuropathic Pain

Diagnosis and Assessment



- Complex chronic pain usually accompanied by soft tissue injury to the scalp or face
- Pain out of proportion to injury
- Burning, tingling type of pain
- Decreased sensation in the affected area

(DoD/DVBIC, 2016)

Headache Related to Neuropathic Pain

Physical Exam



- Findings on physical exam include:
 - Signs of nerve injury detected during neurologic exam
 - Pain may be elicited by palpation of face or scalp, especially over previous laceration or bruise.
 - May be associated with movement

(DoD/VA, 2016)

Table 9.0 Headache Related to Neuropathic Pain – Description



ICD-9-CM: 792.2

ICD-10-CM: 792

Description:*

- A. Pain associated with soft-tissue injury of the scalp or face
- B. May have superimposed lancinating component and may also be burning, deep, and aching
- C. There may be local tingling and numbness, hyperesthesia, hyperalgesia, allodynia (pain due to non-noxious stimulus) or hyperpathia (particularly unpleasant, exaggerated pain response)
- D. Symptoms are long-lasting, typically persisting after resolution of the primary cause

* Modified from: International Headache Society. (2013). The International Classification of Headache Disorders, 3rd edition (beta version). *Cephalalgia*, 33(9), 629-808.

Table 9.0 Headache Related to Neuropathic Pain – Treatment



Non-pharmacologic treatment

- Relaxation therapy
- Physical therapy
- Acupuncture
- Cognitive behavioral therapy (CBT)
- Massage therapy

Pharmacologic treatment^{§§§}

Acute/Abortive Agents

First Line: Acetaminophen or NSAIDs

Second Line: Antiepileptics (e.g., gabapentin, topiramate); tricyclic antidepressants (TCA) (e.g., amitriptyline, nortriptyline)

Preventive Treatment

Antiepileptics (e.g., gabapentin); TCA (e.g., amitriptyline, nortriptyline)

^{§§§} Attal, N., Cruccu, G., Baron, R., Haanpää, M., Hansson, P., Jensen, T.S., Nurmikko, T. & European Federation of Neurological Societies. (2010). EFNS guidelines on the pharmacological treatment of neuropathic pain: 2010 revision. *European Journal of Neurology* 17(9), 1113-e88. U.S. Food and Drug Administration Agency (FDA) warning cautions that NSAIDs can increase the risk of heart attack, heart failure, or stroke in patients with or without pre-existing heart disease, or risk factors for heart disease, even during the first few weeks of treatment, though the risk appears highest with longer use at higher doses.

Medication-Overuse Headache (MOH)



- MOH is characterized as a headache that:
 - Is present for 15 or more days/month
 - Occurs when medications for the treatment of headaches are used at a higher than recommended dose or for longer than recommended time (i.e., more than three months)
- Treatment for MOH is discontinuing the offending medication.
 - Use of other medications to manage withdrawal symptoms is controversial.

(DoD/DVBIC, 2016)

Deployed Service Members with PTH

Donald W. Marion, M.D.

Donald W. Marion, M.D.

(repeat of slide #15)



Donald W. Marion, M.D.

- Senior clinical consultant in the DVBIC Clinical Affairs Division
- Academic neurosurgeon who has focused on the clinical pathophysiology and treatment of TBI for more than 25 years
- Previously served as professor and chair of the Department of Neurosurgery, The Boston University School of Medicine; professor and vice-chair, Department of Neurosurgery, The University of Pittsburgh School of Medicine; and director of the Brain Trauma Research Center at the University of Pittsburgh
- Education:
 - M.D., University of California

Disclosure – Dr. Marion



- Dr. Marion has no financial relationship to disclose.
- The views expressed in this presentation are those of the author and do not necessarily reflect the official policy or position of the Department of Defense, nor the U.S. Government.
- The description of programs in this presentation is for descriptive purposes only and not intended to promote any individual program.

Case Study #1



CPL Smith

CPL Smith: History



- Suffered an mTBI approximately two weeks ago due to a blow to the head.
- He had LOC, nausea, headache and amnesia.
- A head Computed Tomography (CT) was obtained acutely and was normal.
- He has otherwise done well.

CPL Smith: Symptoms



- Headache in the mornings requiring him to lay in bed until they resolve.
 - These do not occur during the rest of the day.
 - He is not taking any medications for headache currently.
 - He is a caffeine drinker and has not changed his caffeine intake and does not take caffeine at night.

CPL Smith: Symptoms

continued



- Dizziness every three days or so lasting approximately five seconds per episode
- Subtle decrease in mental agility and just not feeling as mentally sharp as he normally feels
- No photophobia, a normal neurological exam, and otherwise is back to his normal self including his normal fitness regimen of running and weight lifting

CPL Smith: Treatment



- Tylenol 1000mg by mouth every 6 hours
- Re-evaluate him in 48 hours.

CPL Smith: Next Steps?



- If the headaches persist, what should the next step be?
- Would you recommend starting nortriptyline or amitriptyline? If so, at what dose?
- Are there any other lifestyle changes that should be recommended?

Table 5.0

Characteristics of Headache Types



(repeat of slide #39)

	Migraine	Tension type	Cervicogenic	Related to neuropathic pain	Medication overuse
Aura	Possible (15-33%)	No	No	No	No
Duration	4-72 hours	30 minutes to 7 days	Some or all of the day	Seconds, minutes, hours	Some or all of the day
Frequency	Episodic, variable	1-15 days/ month, variable	Variable	Episodic, variable	Daily > 15 days each month
Site	Unilateral	Bilateral	Usually unilateral	Unilateral	Unilateral or bilateral
Pain characteristics	Pulsating	Pressure/ tightening	Tightening and/or burning	Burning, radiating	Pressing, tightening, pulsating
Pain severity	Moderate/severe	Mild/moderate	Mild/moderate	Moderate/severe	Mild/moderate/severe
Aggravated by movement?	Yes	No	Yes with head movement	Yes	No
Nausea/ vomiting	Yes	No	No	No	No
Photophobia/ phonophobia?	Yes	No	No	No	No

*PCM should consider the possibility of medication overuse headache (MOH) when criteria in Table 5.0 are present. Optimal treatment consists of discontinuation of the offending medications, acute treatment of withdrawal symptoms and pain, and use of analgesic medication as preventative treatment only when necessary.

CPL Smith: Follow Up 24 Hours Later



- According to the Progressive Return to Activity Clinical Recommendations, what stage is the patient currently in?
 - The soldier is currently at Stage 5, and he is having symptoms but they are not brought on by exertion and only occur in the mornings.

CPL Smith: Follow Up 24 Hours Later

continued



- He is a chronic caffeine user. Should he stop all caffeine?
 - Could that contribute to headaches (caffeine-withdrawal headache)? I currently have him avoiding caffeine in the second half of the day so that it does not interfere with his sleep.

CPL Smith: Follow Up 24 Hours Later

continued 2



- Patient is returning to clinic tomorrow. If the Tylenol has not worked sufficiently, I am planning on starting amitriptyline 20 mg by mouth at night. We only have 10 mg tablets.
 - Should I also continue Tylenol or a nonsteroidal anti-inflammatory drug (NSAID)?

Case Study #2



LT Jones

LT Jones: History



- He suffered an mTBI approximately two weeks ago due to a blow to the head.
- He had LOC, nausea, headache and amnesia.
- A head CT was obtained acutely, and was normal.
- He has otherwise done well.

LT Jones: Symptoms



- He experiences headaches in the mornings requiring him to lay in bed until they resolve.
 - ❑ These do not occur during the rest of the day.
 - ❑ He is not taking any medications for headache currently.
 - ❑ He is a caffeine drinker and has not changed his caffeine intake and does not take caffeine at night.

LT Jones: Symptoms

continued



- Dizziness every three days or so lasting approximately five seconds per episode
- A subtle decrease in mental agility and just not feeling as mentally sharp as he normally feels
- No photophobia, a normal neurological exam, and otherwise is back to his normal self including his normal fitness regimen of running and weight lifting

LT Jones: Treatment



- Prescribed Tylenol 1000 mg by mouth every 6 hours and will re-evaluate him in 48 hours.

LT Jones: Next Steps?



- If the headaches persist what should the next step be?
- Would you recommend starting nortriptyline or amitriptyline?
 - If so, at what dose?
- Any other lifestyle changes recommended

Case Study #3



PFC Thomas

PFC Thomas: History (July 5)



- 23 year old active duty soldier who sustained a blow to the head on 5 July
- Hit three times with the handle of a 50 caliber machine gun on the front of the head
- Seen in the field by medic and given Tylenol but not administered Military Acute Concussion Evaluation (MACE), did not have rest period prescribed
- Reports having constant headaches but continued with field/regular duties

PFC Thomas: July 10 (5 days post-injury)



- Went to Emergency Department for worsening headaches
 - ❑ Had head CT (reported as normal by provider in note but not officially read)
 - ❑ Prescribed Toradol, Benadryl, Solu-Medrol and Reglan
 - ❑ Improved with medications and instructed on brain rest but no official profile
 - ❑ Reported normal neurological exam

PFC Thomas: July 13 (8 days post-injury)



- Headaches still bad, 4-6 per day, described as a throbbing, seen in troop medical clinic
 - ❑ Plain films of c-spine reported normal (still no official result in AHLTA-W)
 - ❑ Started on Naprosyn bid 500 mg as needed for pain
 - ❑ Placed on a light duty profile with no participation in physical training
 - ❑ Irregular sleep cycle with odd hours and has been sleeping in an open bay
 - ❑ Reported normal neurological exam

PFC Thomas: July 18 (13 days post-injury)



- Still having an almost constant headache described as throbbing; happens when he walks around; will go away with rest and start again with activity
 - Has still been helping out with company operations and packed up all his stuff and changed duty locations
 - Normal neurological exam with normal Balance Error Scoring System (BESS) score
 - Amitriptyline 25 mg at night
 - Naprosyn 250 mg bid with Tylenol as needed for pain
 - Profiled with light duty only and scheduled rest from 2100 to 0600

PFC Thomas: July 20 (15 days post-injury)



- Now down to two headaches per day, described as throbbing and lasting about one hour. Still gets symptomatic when he tried to Skype with his wife but feels a little better.
- Still having some difficulty sleeping but he is in an open bay and rest of the company returned from a field training exercise in the middle of the night both nights.
- Reports being very, very bored
- Have placed on scheduled bedtime and spoke with 1SG to try to find a quiet place

PFC Thomas: July 20

continued



- Prescribed Ambien 5 mg by mouth at bedtime
- Continued amitriptyline 25 mg by mouth at night
- Naprosyn 500 mg twice daily
- Tylenol as needed for breakthrough pain
- On profile for light duty, NO exercise and scheduled sleep
- Normal neurological exam

PFC Thomas: July 20; Next Steps?



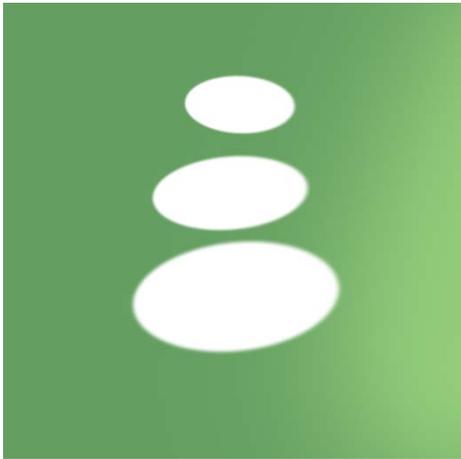
- What is your advice on next steps needed?
- No neurologist in country available for referral.
- What are the appropriate steps for management and follow up?

Summary



- Headache is the most common symptom after a concussion.
- The four most common types of PTH are migraine, tension-type, cervicogenic and headache related to neuropathic pain.
- PTH should be managed corresponding to the headache type it most closely resembles.
 - Examples of effective non-pharmacologic treatment include sleep hygiene, physical therapy and relaxation.
 - Examples of effective symptomatic pharmacologic treatment include non-narcotic pain medicine and triptans.

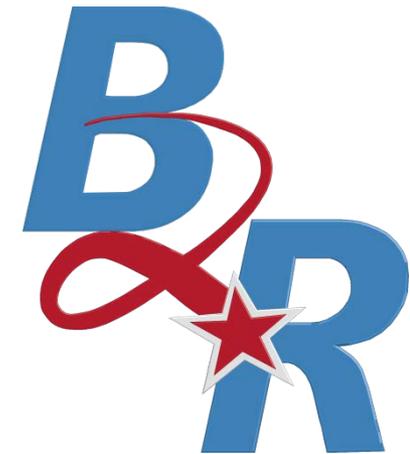
Patient Apps



Mindfulness Coach



Concussion Coach



Breathe2Relax

- Made by the National Center for Telehealth & Technology, a component center of DCoE
- Available for free for Apple and Android devices

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Applications in Military Service Members and
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June 9, 2016; 1-2:30 p.m. (ET)

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Prevention of Sexual Assault in Children

April 28, 2016; 1-2:30 p.m. (ET)

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VA/DoD Clinical Practice Guidelines for the
Management of Concussion/ Mild Traumatic Brain
Injury
June 24, 2016; 12-1:15pm (ET)**

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