

Updated Mild Traumatic Brain Injury (mTBI) Clinical Guidance

Symptom Management in Mild Traumatic Brain Injury

With the increased awareness of mild traumatic brain injury (mTBI) or concussion, many military healthcare providers find themselves treating patients without formal training in neurotrauma. Although the majority of patients with mTBI recover quickly with minimal intervention, there is a subset that develops lingering symptoms that interfere with social and occupational functioning. Following multiple provider requests for assistance in managing this patient population, the Defense and Veterans Brain Injury Center convened an interdisciplinary work group with armed Services and civilian representation to evaluate the current literature regarding mTBI and in the absence of supporting literature, provide expert guidance regarding appropriate management of the symptomatic mTBI patient in the military setting. Areas of foci for this meeting were assessment, medication therapy, other treatment to include specialty referrals, and duty restrictions. Consensus-based recommendations are compiled in this report.

Assessment

The overarching goal of assessment is to identify those patients who may be at risk for traumatic brain injury (TBI), minimize the impact of secondary effects, improve treatment outcome, optimize mTBI care, and to ultimately reduce disability. Since patients with mTBI may not come to clinical attention for a variety of reasons, the purpose of assessment may vary slightly based on the timing of presentation following injury. See algorithms for Clinical Management Guidance for mTBI Acute and Sub-Acute (Attachment 1).

Acute (injury to seven days)	Sub-acute (8-90 days)/Chronic (>90days)
Injury detection	Identification of residual effects
Diagnosis	Differential diagnosis/Identification of comorbidities
Severity grading	Prognosis
Rule out neurosurgical emergency	Treatment planning
Prognosis	Operational decision-making
Treatment planning	
Operational decision-making	

Assessment is symptom triggered, therefore leading to a focused exam. Domains required during the assessment of mTBI include but are not limited to the following:

History:	Incident, mechanism, acute injury characteristics, course
Symptoms:	Systematic inventory (may be facilitated by use of Suggested Tools for Evaluation – Attachment 2)
Neurologic exam:	Cranial nerve exam (focused) Postural stability/vestibular exam (Dix-Hallpike maneuver, Romberg’s test) Visual function (gross acuity, eye movement, binocular function, visual fields, visual inattention)

Neurocognitive function:	Mental status screening, neuropsychological testing, Military Acute Concussion Evaluation (MACE)
Psychological function:	Depression, Post-Traumatic Stress Disorder (PTSD), neurobehavioral (Suggested Tools for Evaluation – Attachment 2)

Imaging studies are not necessary for all mTBI patients. The absence of pathologic signs on computed tomography (CT) does not preclude the presence of mTBI. Indications for CT scanning in the acute phase include drug or alcohol intoxication, physical evidence of trauma above the clavicles, age > 60yrs, seizure, headache, vomiting, and coagulopathy (Haydel, 2000). Structural magnetic resonance imaging (MRI) has a low incidence of positive findings in mTBI (Lewine, 2007). It is contra-indicated in patients with shrapnel and is of limited use with acute mTBI. MRI, single photon emission computed tomography (SPECT) and functional MRI (fMRI) may be more useful for patients who manifest symptoms of cognitive dysfunction after the acute phase has passed. It is recommended that advanced imaging techniques including but not limited to SPECT and fMRI be used only after consultation with a radiologist and a TBI specialist.

Medication Therapy

There is little level 1 evidence to guide pharmacologic treatment in the mTBI patient. Therefore, these recommendations are made based on available evidence and expert opinion. Concussion Management Grid chart (Attachment 3) and the Headache chart – (Attachment 4) list medication recommendations for common mTBI complaints. When considering pharmacotherapy, these principles should be considered:

- Population under consideration- mTBI patients with persistent symptoms (> seven days post-injury)
- Recognition of important premorbid/comorbid conditions or “red flags”
- “Start low and go slow” (low dose with slow titration)
- Initiate medications one at a time, allow an appropriate interval for effect, and titrate to effect
- There is a complex relationship between mTBI symptoms (sleep, headache, cognition, mood) and it is clinically reasonable that alleviating/improving one symptom may lead to improvement in other symptom clusters.

Specialty referral can be considered after failed trials of two or more medication classes at maximum tolerated dosing. In addition, specialty referral should be done immediately upon recognition of any “red flag.”

Therapy

It is strongly recommended mTBI treatment should involve an interdisciplinary team and should be guided by a comprehensive brain injury and mental health assessment. Referrals for physical therapy, occupational therapy, speech & language pathology, pharmacy, audiology/vestibular and optometry can be made at anytime. If cognitive rehabilitation is indicated, it should not be initiated until other medical issues are stabilized and pain is

adequately managed. Symptom-specific interventions may need to be modified to accommodate cognitive, sensory, or mechanical limitations of the patient. Further investigation regarding the timing and components of cognitive rehabilitation are warranted.

Novel therapy (hyperbaric oxygen, nutritional supplements) in the management of mTBI are being explored in the field as potential treatment approaches. It is the recommendation of this panel that interventions which lack sufficient empirical support, should occur only under the auspice of an Institutional Review Board (IRB) reviewed protocol. However, complementary techniques such as acupuncture may be used at the discretion of the provider and patient.

Since the acceleration/deceleration TBI literature documents increased frequency of alcohol and substance abuse in the TBI patient, it is recommended that appropriate screening be instituted for all patients diagnosed with mTBI (Suggested Tools for Evaluation – Attachment 1). Educational materials should be provided to all patients and their families about TBI and the issues related to substance abuse. Those with known alcohol or substance use problems should be referred immediately for counseling and/or treatment.

Formal neuropsychological testing is ideally done prior to the initiation of formal cognitive rehabilitation in order to guide the treatment plan. However, testing may be done anytime in assessment and management of mTBI and may be required during the course of a medical board evaluation. Neuropsychological testing may also be useful following the completion of a rehabilitation plan to evaluate outcomes. Treatment need not be delayed while awaiting neuropsychological testing.

Follow-up for the patient with mTBI is based on the individual plan of care. After initial evaluation, the asymptomatic patient should have follow-up within three to six months. This may be done by telephone. The frequency of follow-up is clinically determined to meet the individual plan of care. Symptomatic patients should be followed every two to four weeks from the time of initial contact. Symptomatic patients may be seen more frequently than two to four weeks while those who are stable may be seen less frequently. It is recognized that patients may transfer duty stations while still undergoing treatment for TBI. In such situations, the profile/limited duty or transfer of care note should clearly specify follow-up needs. Case managers need to arrange the services the patient will need for continuity of care in the community/command in which the patient will reside.

Duty Restrictions

Currently, there is variability among the Service branches in recording duty restrictions for Service members with TBI. Duty restrictions should be informed by the patient's symptoms and progressively task the individual toward return to full duty. In the sub-acute phase (>seven days), symptomatic patients should be considered for limited duty hours to facilitate brain recovery. Progressive physical activity should be encouraged and monitored to the maximum tolerance of the patient without precipitating symptoms. Restricting the work environment and activities (i.e. driving, airborne operations, weapons, working at heights, combatives) further protects the Service member from risk of secondary injury or re-exposure and helps ensure the safety and welfare of others. The stress of complex leadership

positions may also complicate or exacerbate functional deficits, and may also be considered for limitation. This facilitates TBI recovery and may promote unit cohesion.

Exertion testing should be performed when a patient with TBI with previously functionally limiting symptoms, has recovered to a point where return to duty is considered. This ensures that symptoms do not recur with physical stress. When considering return to duty, it is recommended that the following criteria be met:

- Pass a physical fitness test (PFT)
- Pass “warrior training” if needed for duty
- Have anger, depression, PTSD and other psychological health issues controlled and monitored by the primary care clinician
- Have neuropsychological testing within functional limits as determined by a neuropsychological evaluation (including attention, memory, processing speed, executive function domains and others as previous deficits warrant) if cognitive impairment was noted during the assessment and treatment of mTBI.

After the above criteria are met, it is recommended that the Service member be placed on duty restrictions that state, “returned to duty with close command monitoring, non-deployable.” The trial of duty should last 30 days with at least 20 duty days. Following successful completion of a functional duty test, return to full duty including worldwide deployment is acceptable.

For patients with persistent symptoms, return to full duty in the jobs they have preformed may not be possible. Patients may need to proceed through the Medical Evaluation Board (MEB) process or they may need retraining or reclassification in order to be retained on active duty. For patients injured while serving in the National Guard or Reserves, consideration should be made to temporarily retain on active duty status to ensure they receive the care and benefits to which they are entitled. If released from duty, military/VA and civilian partner resources should be identified. MEB can be considered at six months for patients with chronic symptoms. If a patient requests MEB sooner, this request should be considered.

Educational Treatment Initiatives

Provision of TBI education early after diagnosis of mTBI has been shown to decrease symptom prevalence (Ponsford, 2002). Patient education, focused around the natural history of mTBI recovery that provides recommendations to facilitate sleep hygiene, coping strategies, stress management and avoidance of excessive alcohol and drug use would be most useful. Development and implementation of a provider education curriculum have been proposed for use throughout the Department of Defense (DoD). It is recommended that this curriculum be reviewed at least annually and updated as relevant new TBI research becomes available. Massive educational rollout activities are recommended to occur within the DoD to ensure that clinicians are adequately trained in the recognition and management of concussion/mTBI. Finally, command leadership would benefit from education regarding TBI to guide their decisions related to retention and redeployment in order to optimize force health and readiness.

Performance improvement parameters are needed to ensure the utilization of best practice and quality management. Separate consideration should be given for the educational and programmatic components. In the domain of education, patient satisfaction surveys should be included in all education tools. Providers should be given post-education assessments and continuing education credit should be offered. Program evaluation requires various performance metrics that can be measured between levels of care, service branches, and institutions. Data useful to program evaluation may include the following:

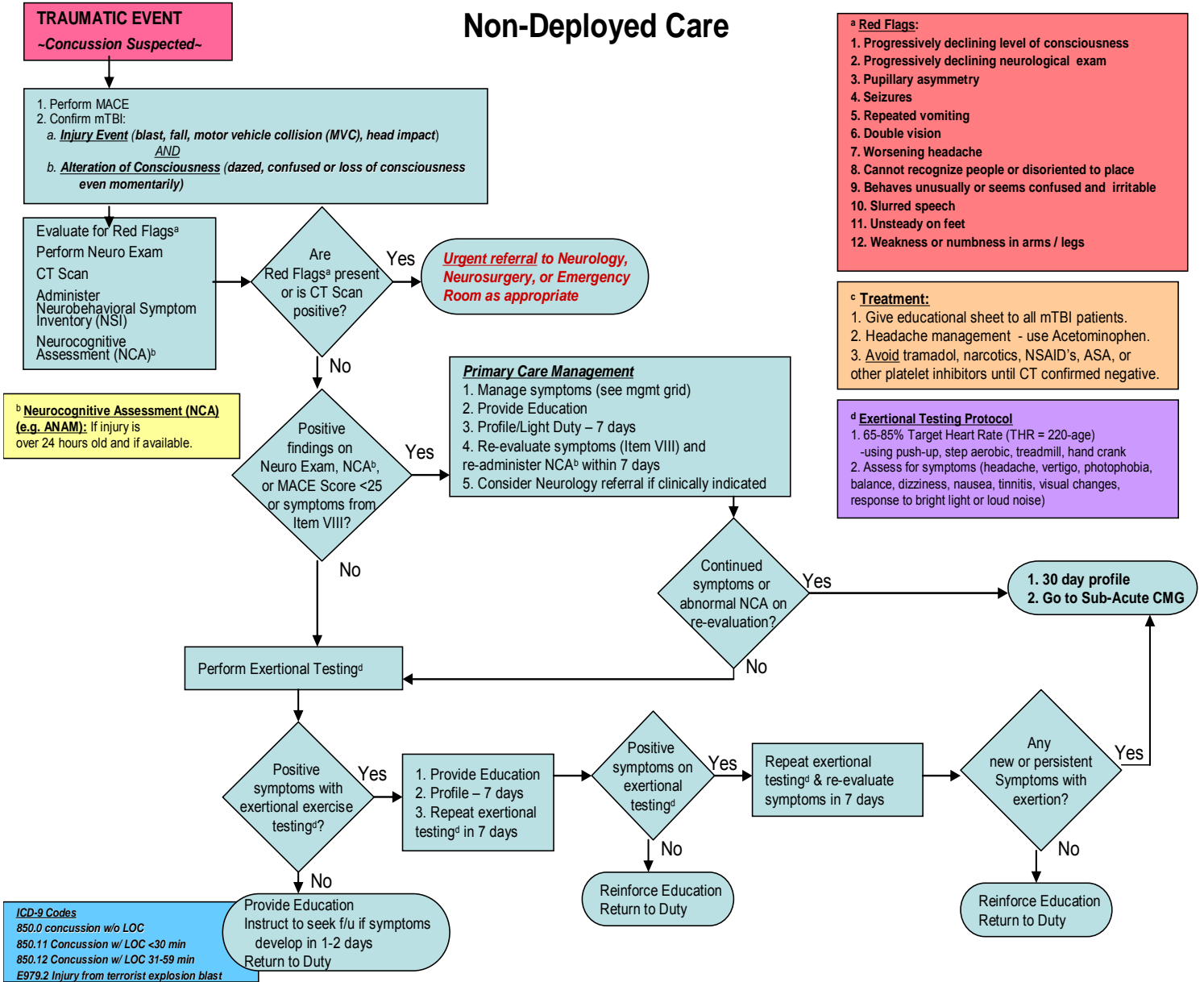
- MEB/Physical Evaluation Board (PEB) rates
- Return to duty rate (full duty/profile/days on profile)
- Patient quality of life
- Patient satisfaction
- Staff turnover
- Staff vacancies
- Access/waiting lists

The comments made in this document are general recommendations only. Attachments contain commonly used assessment tools. Other appropriate screening tools can be used. Sound clinical judgment should dictate the individual treatment plan.

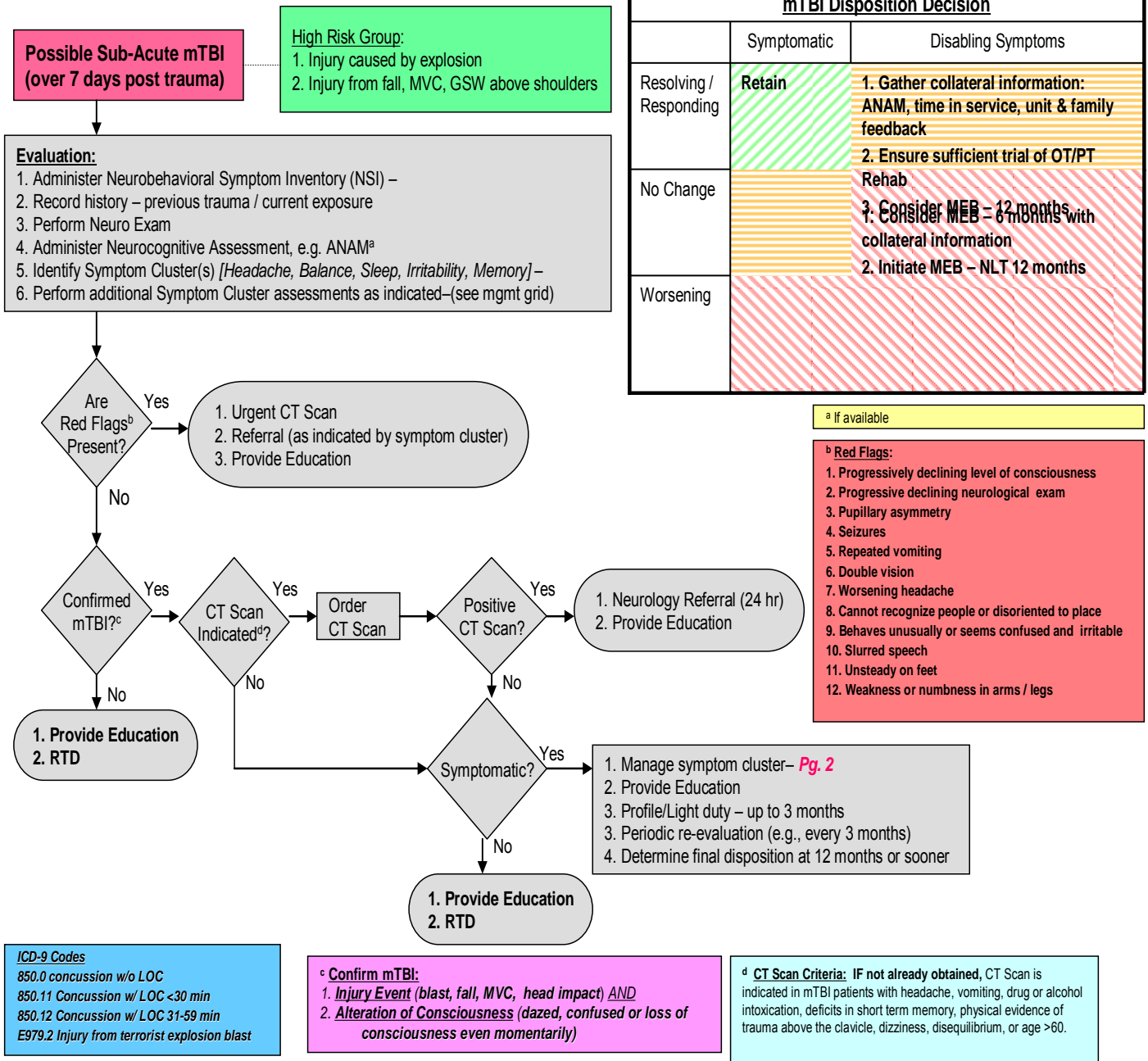
Attachment 1

Clinical Management Guidance for Mild Traumatic Brain Injury – Acute

Non-Deployed Care



Clinical Management Guideline Mild Traumatic Brain Injury – Sub-Acute



Attachment 2

Suggested Tools for Evaluation

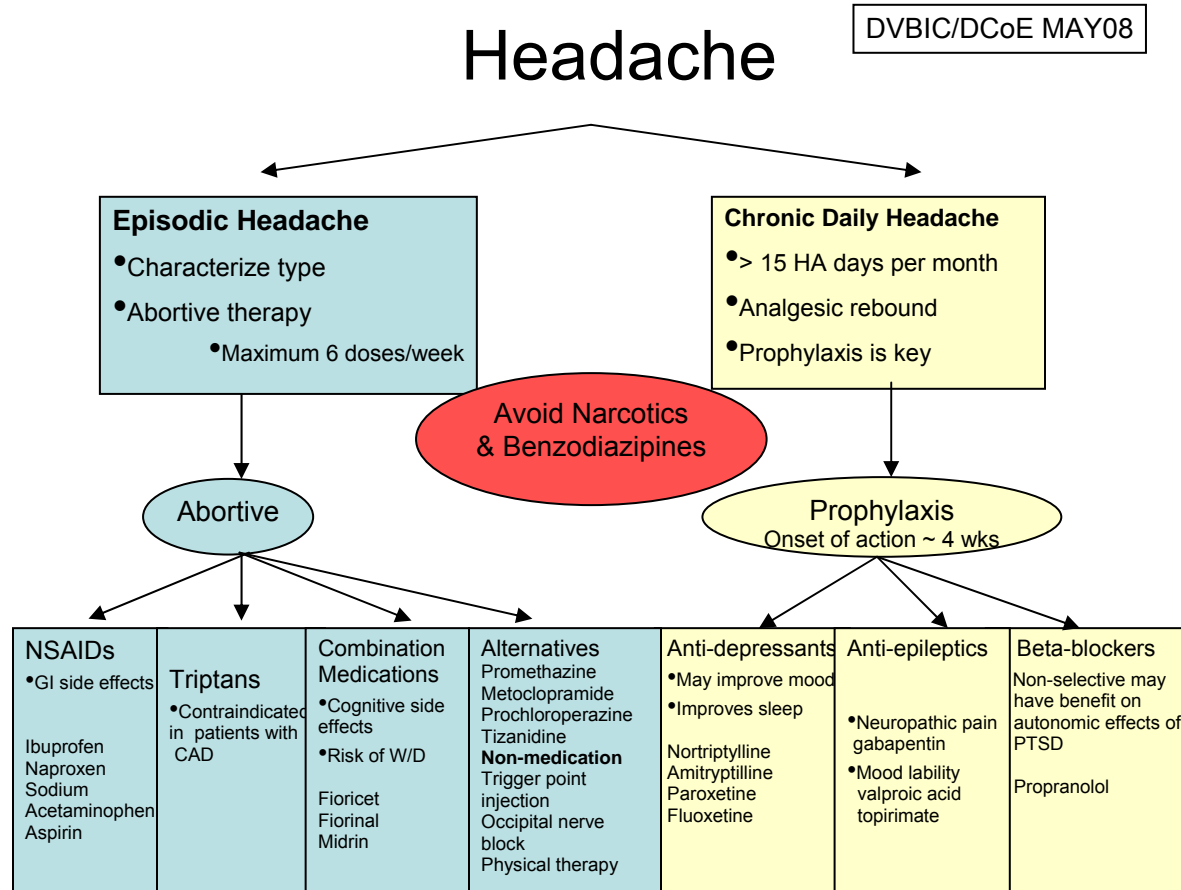
Attachment 3

Concussion Management Grid

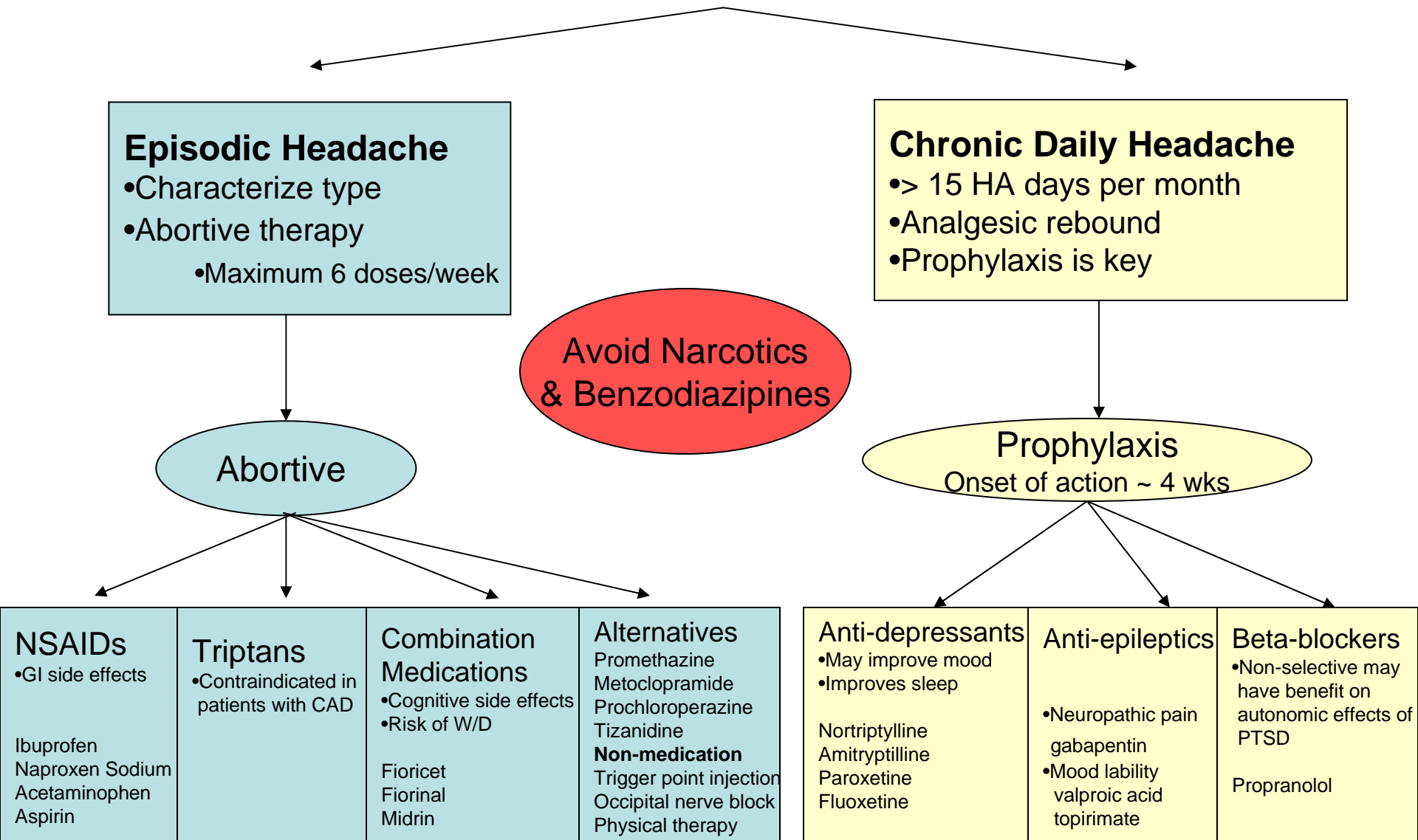
Updated mTBI Clinical Guidance – May 8, 2008

Symptom Cluster	Presenting Symptoms or Complaints Assess frequency, severity, aggravating factors	Special Assessment related to complaint	Assessment Red Flags And <u>Immediate</u> Referral	Treatment Options by Symptom Cluster NOTE: Treat headache, sleep & irritability first as other symptoms often improve with pain control & rest Inclusion does not imply FDA approved use. See full prescribing information.
Headache	Headache Sensitivity to light/sound Tinnitus Nausea	Examine: Neurologic exam Musculoskeletal exam including cervical spine Refer: Any abnormality- 24 hours referral to Neurology	Neurology referral Worsening headache Seizures Blackout Emergency Department (ED) Fever Stiff neck	Episodic: (prn at HA onset, up to 3 days/week): ibuprofen 600-800 mg.; Naproxen; Triptans, compazine, Phenergan Chronic Daily Headache (Preventive)- onset ~4 weeks Propranolol 10- 240mg (BP & PTSD effects) Amitriptylline or Nortriptylline 10-100mg q HS (sleep) AED's gabapentin 300-900 mg q HS to BID sodium valproate 500-1500 mg (draw levels) topiramate 25-100mg q day to BID
Vision	Blurry vision Double vision (diplopia) Difficulty reading or focusing	Examine: Fundoscopic exam, visual acuity, visual fields Consider fluoresceine exam of cornea if foreign body suspected	Neurology referral Papilledema Cranial nerve deficit Optometry or ophthalmology referral Evidence of foreign body (FB)	Optometry evaluation- request binocular testing
Balance & Hearing	Dizziness Vertigo Balance difficulties Coordination problems Ringing in the ears	Examine: Dix- Hallpike Maneuver, Romberg, Cerebellar function (finger to nose, rapid alternating movement), nystagmus ENT/Audiology- otoscopic exam, bedside hearing test, audiogram if avail. Administer: consider Dizziness Handicap Inventory (DHI) normal ≤ 11	Neurology referral Lateral abnormality, nystagmus, abnormal Romberg ED or emergent Neurosurgery referral CSF leak ENT referral Hemotympanum, FB, TM perforation	ENT/Audiology/Vestibular PT referral depending on local resources if Positive Dix-Hallpike- or DHI > 11 or persistent dizziness complaints
Sleep	Fatigue/Loss of energy Difficulty falling asleep Difficulty staying asleep Easily tired Nightmares/sleep walking	Administer: Epworth Sleepiness Scale, consider PSQI Examine: neck size, airway, height, weight Evaluate: sleep routine, medication/supplement use, alcohol & substance abuse, sleep activity, nightmares, frightened arousal Pittsburgh Sleep Quality Index (PSQI) – not included in the package, but available at http://www.sleep.pitt.edu/	Sleep Study referral Apnea ESS>12 BMI >30	Zolpidem 5-10 mg qHS max duration 10 days Trazodone 25-50 mg qHS max dose 150 mg (sleep maintenance) Amitriptylline 25 mg qHS max dose 100mg (headache benefit) Quetiapine 25 mg qHS Max dose 100mg (PTSD, nightmare benefit)
Irritability	Anger Depression Mood swings Anxiety Tension Easily overwhelmed	Administer: PCL-M Screening Questionnaire, consider PHQ-9 or other depression inventory Evaluate: specific history & symptoms: physical fighting, alcohol intake, relationship problems, suicidal, homicidal	Psychiatry/Psychology/Social Work referral Outward violence Excessive alcohol intake Suicidal ideation Homicidal ideation	Sertaline 25-50 mg qD Titrate q7-10d max dose 150mg/d Citalopram 10 mg/day titrate to max dose 40 mg/day Allow 3-4 week therapeutic trial of each drug Refer: treatment failure of two meds
Cognition	Memory loss or lapse Forgetfulness Poor concentration Decreased attention Slowed thinking Executive dysfunction	Administer: MACE if injury within 24 hours, Other neurocognitive testing as available (eg ANAM or other neuropsychological testing) Gather: Collateral information from family, command and others		Normalize sleep & nutrition Pain control Refer: Speech/language pathology Occupational therapy Neuropsychology

Attachment 4



Headache



Symptom Cluster	Presenting Symptoms or Complaints Assess frequency, severity, aggravating factors	Special Assessment related to complaint	Assessment Red Flags And <u>Immediate</u> Referral	Treatment Options by Symptom Cluster NOTE: Treat headache, sleep & irritability first as other symptoms often improve with pain control & rest Inclusion does not imply FDA approved use. See full prescribing information.
Headache	Headache Sensitivity to light/sound Tinnitus Nausea	Examine: Neurologic exam Musculoskeletal exam including cervical spine Refer: Any abnormality- 24 hours referral to Neurology	Neurology referral Worsening headache Seizures Blackout Emergency Department (ED) Fever Stiff neck	Episodic: (prn at HA onset, up to 3 days/week): ibuprofen 600-800 mg.; Naproxen; Triptans, compazine, Phenergan Chronic Daily Headache (Preventive) - onset ~4 weeks Propranolol 10- 240mg (BP & PTSD effects) Amitriptylline or Nortriptylline 10-100mg q HS (sleep) AED's gabapentin 300-900 mg q HS to BID sodium valproate 500-1500 mg (draw levels) topiramate 25-100mg q day to BID
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Sleep	Fatigue/Loss of energy Difficulty falling asleep Difficulty staying asleep Easily tired Nightmares/sleep walking	Administer: Epworth Sleepiness Scale, consider PSQI Examine: neck size, airway, height, weight Evaluate: sleep routine, medication/supplement use, alcohol & substance abuse, sleep activity, nightmares, frightened arousal	Sleep Study referral Apnea ESS>12 BMI >30	Zolpidem 5-10 mg qHS max duration 10 days Trazodone 25-50 mg qHS max dose 150 mg (sleep maintenance) Amitriptylline 25 mg qHS max dose 100mg (headache benefit) Quetiapine 25 mg qHS Max dose 100mg (PTSD, nightmare benefit)
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DRUG USE QUESTIONNAIRE (DAST-20)

Name: _____ Date: _____

The following questions concern information about your potential involvement with drugs not including alcoholic beverages during the past 12 months. Carefully read each statement and decide if your answer is "Yes" or "No". Then, circle the appropriate response beside the question.

In the statements "drug abuse" refers to (1) the use of prescribed or over the counter drugs in excess of the directions and (2) any non-medical use of drugs. The various classes of drugs may include: cannabis (e.g. marijuana, hash), solvents, tranquilizers (e.g. Valium), barbiturates, cocaine, stimulants (e.g. speed), hallucinogens (e.g. LSD) or narcotics (e.g. heroin). Remember that the questions do not include alcoholic beverages.

Please answer every question. If you have difficulty with a statement, then choose the response that is mostly right.

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For information on the DAST, contact Dr. Harvey Skinner at the Addiction Research Foundation, 33 Russell St., Toronto, Canada, M5S 2S1.

These questions refer to the past 12 months.

Circle your
response

1. Have you used drugs other than those required for medical reasons?..... Yes No
2. Have you abused prescription drugs? Yes No
3. Do you abuse more than one drug at a time? Yes No
4. Can you get through the week without using drugs? Yes No
5. Are you always able to stop using drugs when you want to?..... Yes No
6. Have you had "blackouts" or "flashbacks" as a result of drug use? Yes No
7. Do you ever feel bad or guilty about your drug use? Yes No
8. Does your spouse (or parents) ever complain about your involvement with drugs? Yes No
9. Has drug abuse created problems between you and your spouse or your parents? Yes No
10. Have you lost friends because of your use of drugs? Yes No
11. Have you neglected your family because of your use of drugs? Yes No
12. Have you been in trouble at work because of drug abuse? Yes No
13. Have you lost a job because of drug abuse? Yes No
14. Have you gotten into fights when under the influence of drugs? Yes No
15. Have you engaged in illegal activities in order to obtain drugs? Yes No
16. Have you been arrested for possession of illegal drugs? Yes No
17. Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs? Yes No
18. Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, bleeding, etc.)?..... Yes No
19. Have you gone to anyone for help for a drug problem? Yes No
20. Have you been involved in a treatment program specifically related to drug use? Yes No

Neurobehavioral Symptom Inventory (NSI)

Please rate the following symptoms with regard to how much they have disturbed you IN THE LAST 2 Weeks.
The purpose of this inventory is to track symptoms over time. Please do not attempt to score.

0 = None – Rarely if ever present; not a problem at all

1 = Mild – Occasionally present, but it does not disrupt my activities; I can usually continue what I'm doing; doesn't really concern me.

2 = Moderate – Often present, occasionally disrupts my activities; I can usually continue what I'm doing with some effort; I feel somewhat concerned.

3 = Severe – Frequently present and disrupts activities; I can only do things that are fairly simple or take little effort; I feel I need help.

4 = Very Severe – Almost always present and I have been unable to perform at work, school or home due to this problem; I probably cannot function without help.

Symptoms	0	1	2	3	4
Feeling Dizzy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of balance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor coordination, clumsy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Headaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nausea	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vision problems, blurring, trouble seeing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sensitivity to light	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hearing difficulty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sensitivity to noise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Numbness or tingling on parts of my body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change in taste and/or smell	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of appetite or increased appetite	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor concentration, can't pay attention, easily distracted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forgetfulness, can't remember things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty making decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slowed thinking, difficulty getting organized, can't finish things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fatigue, loss of energy, getting tired easily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty falling or staying asleep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling anxious or tense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling depressed or sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritability, easily annoyed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor frustration tolerance, feeling easily overwhelmed by things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Date:

Name:

Medical Record #:

PTSD Checklist – Military Version (PCL – M)

Instruction to patient: Below is a list of problems and complaints that veterans sometimes have in response to stressful military experiences. Please read each one carefully, fill in the circle to indicate how much you have been bothered by that problem in the last month.

- 1 = Not at all
- 2 = A little bit
- 3 = Moderately
- 4 = Quite a bit
- 5 = Extremely

No.	Response:	1	2	3	4	5
1.	Repeated, disturbing memories, thoughts, or images of a stressful military experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	Repeated, disturbing dreams of a stressful military experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	Suddenly acting or feeling as if a stressful military experience were happening again (as if you were reliving it)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	Feeling very upset when something reminded you of a stressful military experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	Having physical reactions (e.g., heart pounding, trouble berating, or sweating) when something reminded you of a stressful military experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	Avoid thinking about or talking about a stressful military experience or avoid having feelings related to it?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	Avoid activities or situations because they remind you of a stressful military experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	Trouble remembering important parts of a stressful military experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	Loss of interest in things that you used to enjoy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	Feeling distant or cut off from other people?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.	Feeling emotionally numb or being unable to have loving feelings for those close to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.	Feeling as if your future will somehow be cut short?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.	Trouble falling or staying asleep?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14.	Feeling irritable or having angry outbursts?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.	Having difficulty concentrating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.	Being “super alert” or watchful on guard?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.	Feeling jumpy or easily startled?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If score greater than 40, consider further evaluation.

Subject's Initials _____ ID# _____ Date _____ Time _____ AM
PM

PITTSBURGH SLEEP QUALITY INDEX

INSTRUCTIONS:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?

BED TIME _____

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?

NUMBER OF MINUTES _____

3. During the past month, what time have you usually gotten up in the morning?

GETTING UP TIME _____

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)

HOURS OF SLEEP PER NIGHT _____

For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you . . .

- a) Cannot get to sleep within 30 minutes

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
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- b) Wake up in the middle of the night or early morning

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
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- c) Have to get up to use the bathroom

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

d) Cannot breathe comfortably

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
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e) Cough or snore loudly

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

f) Feel too cold

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

g) Feel too hot

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

h) Had bad dreams

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

i) Have pain

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

j) Other reason(s), please describe _____

How often during the past month have you had trouble sleeping because of this?

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

6. During the past month, how would you rate your sleep quality overall?

Very good _____

Fairly good _____

Fairly bad _____

Very bad _____

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

Not during the past month _____ Less than once a week _____ Once or twice a week _____ Three or more times a week _____

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Not during the past month _____ Less than once a week _____ Once or twice a week _____ Three or more times a week _____

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

No problem at all _____
 Only a very slight problem _____
 Somewhat of a problem _____
 A very big problem _____

10. Do you have a bed partner or room mate?

No bed partner or room mate _____
 Partner/room mate in other room _____
 Partner in same room, but not same bed _____
 Partner in same bed _____

If you have a room mate or bed partner, ask him/her how often in the past month you have had . . .

a) Loud snoring

Not during the past month _____ Less than once a week _____ Once or twice a week _____ Three or more times a week _____

b) Long pauses between breaths while asleep

Not during the past month _____ Less than once a week _____ Once or twice a week _____ Three or more times a week _____

c) Legs twitching or jerking while you sleep

Not during the past month _____ Less than once a week _____ Once or twice a week _____ Three or more times a week _____

d) Episodes of disorientation or confusion during sleep

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
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e) Other restlessness while you sleep; please describe _____

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
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The Dizziness Handicap Inventory (DHI)

P1. Does looking up increase your problem?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E2. Because of your problem, do you feel frustrated?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F3. Because of your problem, do you restrict your travel for business or recreation?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
P4. Does walking down the aisle of a supermarket increase your problems?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F5. Because of your problem, do you have difficulty getting into or out of bed?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F6. Does your problem significantly restrict your participation in social activities, such as going out to dinner, going to the movies, dancing, or going to parties?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F7. Because of your problem, do you have difficulty reading?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
P8. Does performing more ambitious activities such as sports, dancing, household chores (sweeping or putting dishes away) increase your problems?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E9. Because of your problem, are you afraid to leave your home without having someone accompany you?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E10. Because of your problem have you been embarrassed in front of others?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
P11. Do quick movements of your head increase your problem?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F12. Because of your problem, do you avoid heights?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
P13. Does turning over in bed increase your problem?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F14. Because of your problem, is it difficult for you to do strenuous homework or yard work?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E15. Because of your problem, are you afraid people may think you are intoxicated?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F16. Because of your problem, is it difficult for you to go for a walk by yourself?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
P17. Does walking down a sidewalk increase your problem?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E18. Because of your problem, is it difficult for you to concentrate	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F19. Because of your problem, is it difficult for you to walk around your house in the dark?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No

E20. Because of your problem, are you afraid to stay home alone?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E21. Because of your problem, do you feel handicapped?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E22. Has the problem placed stress on your relationships with members of your family or friends?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
E23. Because of your problem, are you depressed?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
F24. Does your problem interfere with your job or household responsibilities?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
P25. Does bending over increase your problem?	<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No

Used with permission from GP Jacobson.

Jacobson GP, Newman CW: The development of the Dizziness Handicap Inventory. *Arch Otolaryngol Head Neck Surg* 1990;116: 424-427

DHI Scoring Instructions

The patient is asked to answer each question as it pertains to dizziness or unsteadiness problems, specifically considering their condition during the last month. Questions are designed to incorporate functional (F), physical (P), and emotional (E) impacts on disability.

To each item, the following scores can be assigned:

No=0 Sometimes=2 Yes=4

Scores:

Scores greater than 10 points should be referred to balance specialists for further evaluation.

16-34 Points (mild handicap)

36-52 Points (moderate handicap)

54+ Points (severe handicap)

Clinical Management Guidance for Mild Traumatic Brain Injury – Acute

Non-Deployed Care

TRAUMATIC EVENT
~Concussion Suspected~

1. Perform MACE
2. Confirm mTBI:
a. Injury Event (blast, fall, motor vehicle collision (MVC), head impact)
AND
b. Alteration of Consciousness (dazed, confused or loss of consciousness even momentarily)

Evaluate for Red Flags^a
Perform Neuro Exam
CT Scan
Neurocognitive Assessment (NCA)^b

Are Red Flags^a present or is CT Scan positive?

Urgent referral to Neurology, Neurosurgery, or Emergency Room as appropriate

^b Neurocognitive Assessment (NCA)
(e.g. ANAM): If injury is over 24 hours old and if available.

Positive findings on Neuro Exam, NCA^b, or MACE Score <25 or symptoms from Item VIII?

Primary Care Management
1. Manage symptoms^c
2. Provide Education
3. Profile/Light Duty – 7 days
4. Re-evaluate symptoms (Item VIII) and re-administer NCA^b within 7 days
5. Consider Neurology referral if clinically indicated

Continued symptoms or abnormal NCA on re-evaluation?

1. 30 day profile
2. Go to Sub-Acute CMG

Perform Exertional Testing^d

Positive symptoms with exertional exercise testing^d?

1. Provide Education
2. Profile – 7 days
3. Repeat exertional testing^d in 24 hours

Positive symptoms on exertional testing^d?

Repeat exertional testing^d & re-evaluate symptoms in 7 days

Any new or persistent Symptoms with exertion?

Provide Education
Instruct to seek f/u if symptoms develop in 1-2 days
Return to Duty

Reinforce Education
Return to Duty

Reinforce Education
Return to Duty

- ^a Red Flags:**
1. Progressively declining level of consciousness
 2. Progressively declining neurological exam
 3. Pupillary asymmetry
 4. Seizures
 5. Repeated vomiting
 6. Double vision
 7. Worsening headache
 8. Cannot recognize people or disoriented to place
 9. Behaves unusually or seems confused and irritable
 10. Slurred speech
 11. Unsteady on feet
 12. Weakness or numbness in arms / legs

- ^c Treatment:**
1. Give educational sheet to all mTBI patients.
 2. Headache management - use Acetaminophen.
 3. Avoid tramadol, narcotics, NSAID's, ASA, or other platelet inhibitors until CT confirmed negative.

- ^d Exertional Testing Protocol**
1. 65-85% Target Heart Rate (THR = 220-age)
-using push-up, step aerobic, treadmill, hand crank
 2. Assess for symptoms (headache, vertigo, photophobia, balance, dizziness, nausea, tinnitus, visual changes, response to bright light or loud noise)

ICD-9 Codes
850.0 concussion w/o LOC
850.11 Concussion w/ LOC <30 min
850.12 Concussion w/ LOC 31-59 min
E979.2 Injury from terrorist explosion blast

Clinical Management Guideline Mild Traumatic Brain Injury – Sub-Acute

Possible Sub-Acute mTBI (over 7 days post trauma)

High Risk Group:
 1. Injury caused by explosion
 2. Injury from fall, MVC, GSW above shoulders

Evaluation:
 1. Administer Symptom and History Questionnaire – **Pg. 3**
 2. Record history – previous trauma / current exposure
 3. Perform Neuro Exam
 4. Administer Neurocognitive Assessment, e.g. ANAM^a
 5. Identify Symptom Cluster(s) [*Headache, Balance, Sleep, Irritability, Memory*] – **Pg. 2**
 6. Perform additional Symptom Cluster assessments as indicated – **Pg. 2**

Are Red Flags^b Present?

Yes
 1. Urgent CT Scan
 2. Referral (as indicated by symptom cluster)
 3. Provide Education

No

Confirmed mTBI?^c

Yes
 Symptomatic?
Yes
 1. Manage symptom cluster – **Pg. 2**
 2. Provide Education
 3. Profile/Light duty – up to 3 months
 3. Periodic re-evaluation (e.g., every 3 months)
 4. Determine final disposition at 12 months or sooner

No
 1. Provide Education
 2. RTD

No

1. Provide Education
 2. RTD

mTBI Disposition Decision		
	Symptomatic	Disabling Symptoms
Resolving / Responding	Retain	1. Gather collateral information: ANAM, time in service, unit & family feedback 2. Ensure sufficient trial of OT/PT Rehab 3. Consider MEB – 12 months
No Change	No Change	1. Consider MEB – 6 months with collateral information 2. Initiate MEB – NLT 12 months
Worsening	Worsening	1. Consider MEB – 6 months with collateral information 2. Initiate MEB – NLT 12 months

^a If available

^b Red Flags:
 1. Progressively declining level of consciousness
 2. Progressive declining neurological exam
 3. Pupillary asymmetry
 4. Seizures
 5. Repeated vomiting
 6. Double vision
 7. Worsening headache
 8. Cannot recognize people or disoriented to place
 9. Behaves unusually or seems confused and irritable
 10. Slurred speech
 11. Unsteady on feet
 12. Weakness or numbness in arms / legs

ICD-9 Codes
 850.0 concussion w/o LOC
 850.11 Concussion w/ LOC <30 min
 850.12 Concussion w/ LOC 31-59 min
 E979.2 Injury from terrorist explosion blast

^c Confirm mTBI:
 1. Injury Event (blast, fall, MVC, head impact) **AND**
 2. Alteration of Consciousness (dazed, confused or loss of consciousness even momentarily)

^d CT Scan Criteria: IF not already obtained, CT Scan is indicated in mTBI patients with headache, vomiting, drug or alcohol intoxication, deficits in short term memory, physical evidence of trauma above the clavicle, dizziness, disequilibrium, or age >60.

Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the situations described below, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you haven't done some of these things recently try to work out how they would have affected you.

Score the chance that you would doze off in the following situations based on the scale:

0 = would never doze

1 = Slight chance of dozing

2 = Moderate chance of dozing

3 = High chance of dozing

Situation	Chance of dozing
Sitting and reading	
Watching TV	
Sitting, inactive in a public place (e.g. a theatre or a meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after a lunch without alcohol	
In a car, while stopped for a few minutes in the traffic	

Scoring:

0-10 Normal range

10-12 Borderline

12-24 Abnormal