VA/DoD CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF CONCUSSION-MILD TRAUMATIC BRAIN INJURY

2016 Update

Geoffrey G. Grammer, COL. MD, DVBIC
Thomas J. DeGraba, MD, NICoE
Linda M. Picon, MCD, CCC-SLP, VA

VA HSR&D Cyberseminars
September 29, 2016

VA HEALTH CARE Defining EXCELLENCE in the 21st Century

Veterans Health Administration

Army Col. (Dr.) Geoffrey G. Grammer

- National Director of Defense and Veterans Brain Injury Center (DVBIC)
- Assistant professor of psychiatry at Uniformed Services University of the Health Sciences (USUHS)
- Recent department chief of research at National Intrepid Center of Excellence (NICoE)
- Eight years as chief of inpatient psychiatric services at Walter Reed National Military Medical Center (WRNMMC)
- Board certified in psychiatry, geriatric psychiatry, behavioral neurology and neuropsychiatry
- Recipient of numerous military awards, twice deployed to Iraq and once to Afghanistan

Dr. Thomas J. DeGraba, M.D.

- Chief Innovations Officer and Founding Deputy Director, National Intrepid Center of Excellence (NICoE)
- Head of Stroke Clinic and Cerebrovascular Lab at National Naval Medical Center from 2002 to 2009
- Senior Staff Fellow, National Institute of Neurological Disorder and Stroke (NINDS), establishing the first Intramural Clinical Stroke Program at the National Institutes of Health (NIH), Intramural main campus 1992-2002,
- Prior Associate Professor (Neurology), Uniformed Services University of the Health Sciences (USUHS)
- Nationally recognized clinical neuroscience subject matter expert and leader in the field of neurology, for over twenty five years

Linda M. Picon, MCD, CCC-SLP

- VA Senior Consultant/Liaison for Traumatic Brain Injury to the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury in the Office of Rehabilitation and Prosthetic Services, VHA
- Received congressional commendation for exceptional service to wounded Service members and Veterans
- Over 20 year's experience in TBI rehabilitation and collaborator in the development of evidence-based treatment recommendations, clinical practice guidelines and congressionally-mandated research protocols for the advancement of TBI care and rehabilitation in VA and DoD.

Presentation Overview

- Since the release of the of the original VA/DoD Clinical Practice Guideline (CPG) for the Management of Concussion-Mild Traumatic Brain Injury (mTBI) in 2009, continued research has augmented what is known about mTBI and the complexity of this condition. As a result of this updated understanding and additional information, new strategies for management and treatment of service members and veterans diagnosed with mTBI have evolved and been put into practice. This evolution prompted the recently revised version of the CPG (released in early 2016).
- Members of the Management of Concussion-Mild Traumatic Brain Injury Working Group will present an introduction to the revised VA/DoD Clinical Practice Guidelines for the Management of Concussion-Mild Traumatic Brain Injury. Speakers will highlight updates in the 2016 version and will discuss the accompanying CPG mTBI algorithm, a reference tool used to guide providers through assessment, treatment, and management of patients with mTBI.

Disclosures

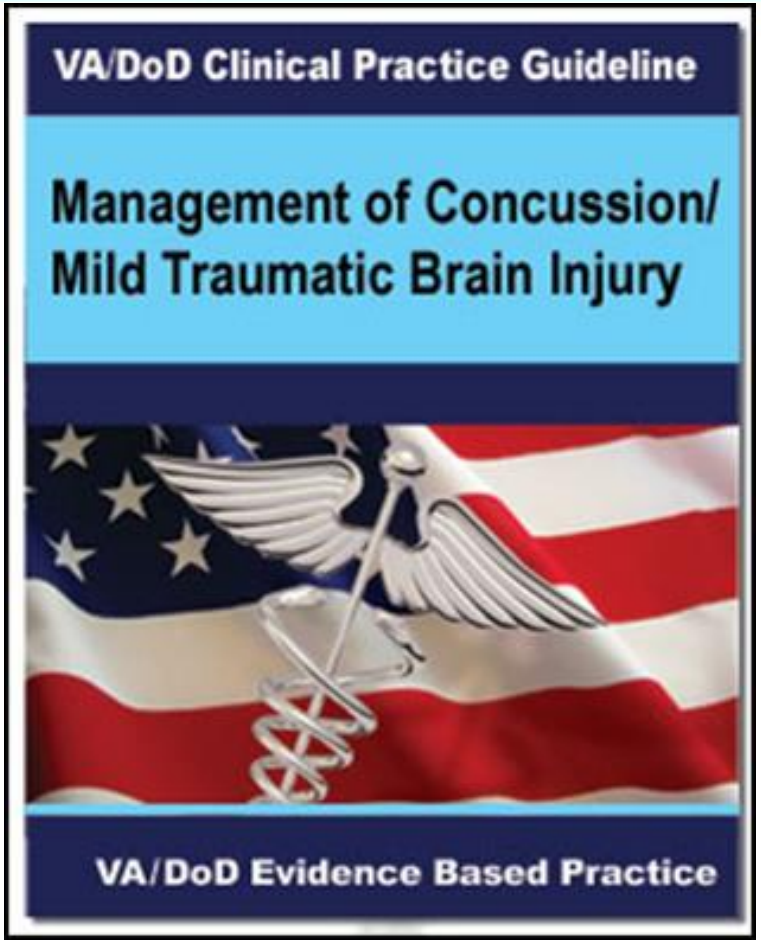
The CPG discussed in this presentation is an official VA and DoD document. The views expressed in this presentation are those of the speakers and do not reflect the official policy of the Veterans Administration or the U.S. Government.

Army Col. (Dr.) Geoffrey G. Grammer
Dr. Thomas DeGraba, MD
Ms. Linda M. Picon, MCD

- We have no relevant financial relationships to disclose.
- We do not intend to discuss devices, products or procedures which are off-label, unlabeled, experimental, and/or investigational (not FDA approved).

VA/DoD Clinical Practice Guidelines: Management of Concussion-mTBI (2016)

- Describes critical decision points in the management of concussion/mTBI
- Formatted as two algorithms and 23 evidence-based recommendations
  - Algorithm A: Initial Presentation
  - Algorithm B: Management of Symptoms
- Based on a comprehensive rigorous evidence review



Scope of the CPG mTBI

- Designed to assist providers in managing or comanaging patients with a history of mTBI
- Population of interest are Veterans, deployed or non-deployed active duty Service Members, and National Guard and Reserve components eligible for care in the VHA and DoD healthcare delivery systems
- Only individuals who are 18+ years of age, in the acute to chronic period post-injury, with the severity classification of a mild TBI

Caveats

The VA/DoD Clinical Practice Guideline for the Management of Concussion/mTBI:

- Based upon the best information available at the time of publication (March, 2016)
- Not constructed or intended to define a standard of care
- Does not prescribe an exclusive course of management
- Recognize variations in practice inevitably and appropriately occur
- Every healthcare professional making use of these guidelines is responsible for evaluating the appropriateness of applying them in the setting of any particular clinical situation

Polling question

How familiar are you with the previous (2009) version of the VA/DoD CPG for Management of mild TBI/Concussion? Choose the closest answer.

A) Very familiar. Used it in my clinical practice.

B) Somewhat familiar, but never or rarely used it in practice.

C) Never heard of it. Unaware there was a CPG for mild TBI.

Updated post-injury periods

2009 Post-Injury Period	2016 Updated Post-Injury period
• Immediate/Acute period – 0-7 days • Early post-acute recovery period – 7-30 days post injury • Follow-up period – 4-6 weeks post injury • Persistent symptoms/Chronic phase – Beyond 4-6 weeks	• Immediate period – 0-7 days post injury • Acute period – 1-6 weeks post injury • Post-acute period – 7-12 weeks post injury • Chronic – > 12 weeks post-injury

Terminology Changes

- Terms “mTBI” and “concussion” used interchangeably
- “Patients with a ***history of*** mTBI” recommended term over “Patient with mTBI”
- Classification of TBI only refers to those symptoms and signs that occur in the *immediate injury period*, and thus should never be used in the present tense to refer to ongoing symptoms that persist and are attributed to the TBI injury after the immediate period

Guideline Development Methodology

- Evidence-based Practice Work Group (EBPWG) and CPG partner champions selected and tasked with identifying the scope and key questions to guide systematic literature review on mTBI
- Extensive literature review conducted by Lewin team based upon the key research questions
- 3-day face-to-face meeting of EBPWG and CPG partner champions to develop and draft new guidelines based upon the evidence, using new grading system
- Several drafting and revisions made from peer and internal review feedback. Guideline finalized January, 2016

Guideline Working Group (2014 – 2016)

Department of Veterans Affairs

David X. Cifu, MD (Co-chair)
Jennifer Burton, DPT
Mary Damerson, MSN, RN, CRRN, CCM, CBIS
Blessen C. Eapen, MD
Robin A. Hurley, MD, FANPA
Scott D. McDonald, PhD
Linda M. Picon, MCD, CCC-SLP
Ronald G. Riechers, II, MD
Kathryn Tortorice, PharmD, BCPS
Linda Van Horn, MSN, BSN, CFNP
Deborah Voydetich, OTR/L, SCLV

Office of Quality, Safety and Value Veterans Health Administration

Eric Rodgers, PhD, FNP, BC
Rene Sutton, BS, HCA

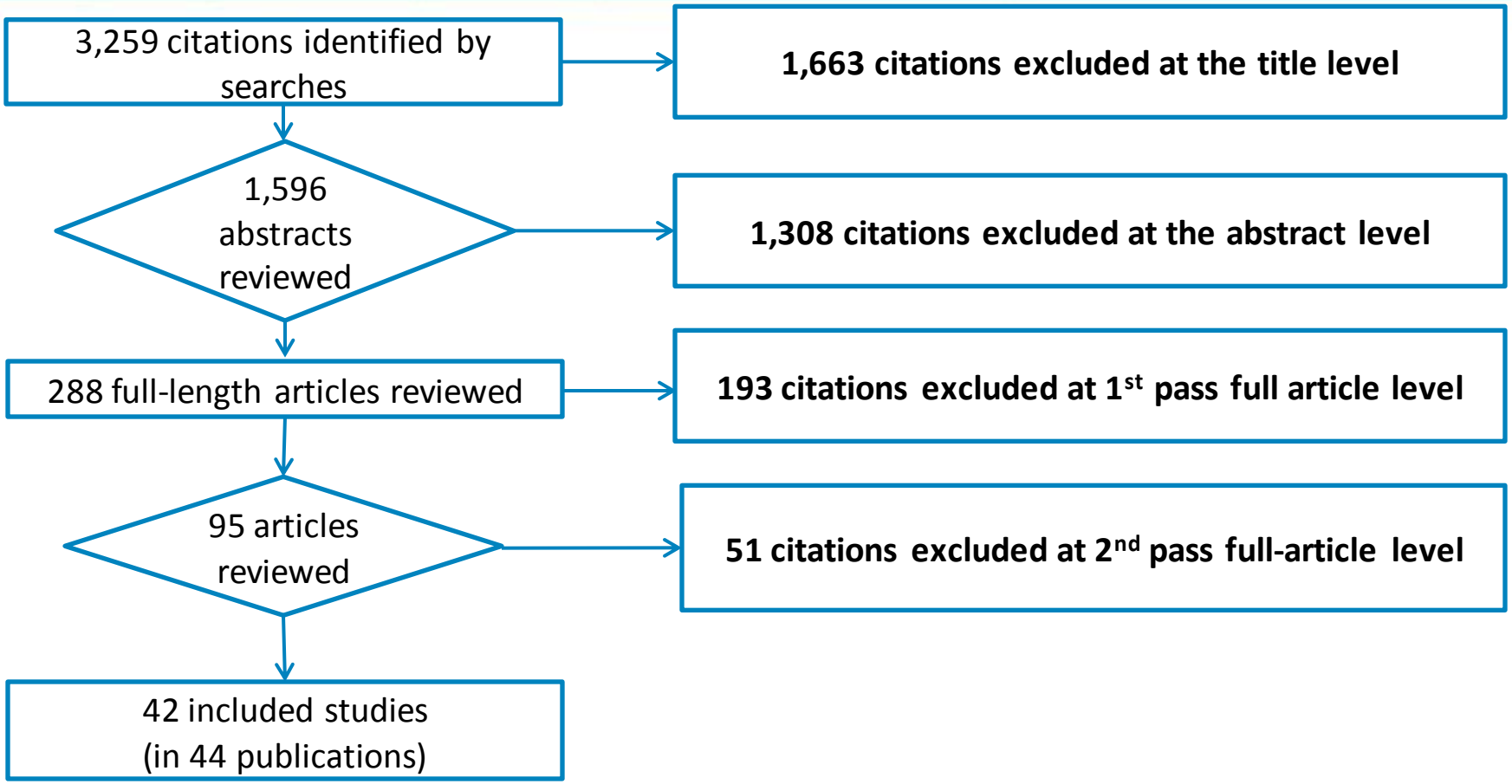
Department of Defense

COL Geoffrey G. Grammer, MD (Co-Chair)
COL Lisa Teegarden, PsyD (Co-Chair)
Amy O. Bowles, MD
Megan Chilson, PharmD
Thomas J. DeGraba, MD
CDR Josh L. Duckworth, MD
CDR Jeffrey Feinberg, MD, MPH, FAAFP
Louis M. French, PsyD
COL Sidney R. Hinds II, MD
Charles W. Hoge, MD
Timothy Lacy, MD
James Sall, PhD, FNP-BC
Major Derrick F. Vaner, PhD, DFAAPA

Office of Evidence Based Practice U.S. Army Medical Command

Ernest Degenhardt, COL USA (Ret.) RN, MSN, ANP/FNP, BC
Corinne K.B. Devlin, MSN, RN, FNP-BC
James Sall, PhD, FNP-BC

Evidence Review Based on the 10 Key Questions



The GRADE system: Recommendation Strength

- The strength of a recommendation is defined as the extent to which one can be confident that the desirable effects of an intervention outweigh its undesirable effects
- Based on
  - The four decision domains to determine strength and direction
  - Relative strength (Strong or Weak)
  - Direction (For or Against)
- The grade of each recommendation is presented as part of a continuum:
  - Strong For (or "We recommend offering this option…")
  - Weak For (or "We suggest offering this option…")
  - Weak Against (or "We suggest not offering this option")
  - Strong Against (or "We recommend against offering this option…")

Evidence Review table A-2
Recommendation Categories & Definitions*

Reviewed Category *	Recommendation Definition*
New-added	New recommendation following review of the evidence
New-replaced	Recommendation carried over to updated CPG and changed after evidence review
Not changed	Recommendation from previous CPG that has been carried forward to the updated CPG where the evidence was reviewed but the recommendation is not changed
Amended	Prior recommendation carried over to updated CPG where the evidence has been reviewed and a minor amendment has been made
Deleted	Recommendation from prior CPG removed after review of the evidence
Un-reviewed Category *	**Recommendation Definition***
Not changed	Recommendation from previous CPG that has been carried forward to the updated CPG, but for which the evidence has not been reviewed
Amended	Recommendation from the previous CPG that has been carried forward to the updated CPG where the evidence was not reviewed and minor amendment made
Deleted	Prior CPG recommendation removed as deemed out of scope for updated CPG

*Adapted from NICE guideline manual (2012) [6] and Garcia et al. (2014) [7]

Outline CPG mTBI:
23 Recommendations in 4 Categories

A. Diagnosis and assessment
B. Co-occurring Conditions
C. Treatment
D. Setting of Care

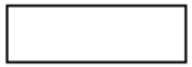
Breakdown of Recommendations by Category in 2016 CPG mTBI

Reviewed Category	A Diagnosis and Treatment	B Co occurring Conditions	C Treatment	D Setting of Care	TOTAL
New-added	-	-	4	-	**4**
New-replaced	2	-	2	1	**5**
Amended	-	-	3	3	**6**
Not reviewed Category	**A Diagnosis and Treatment**	**B Co occurring Conditions**	**C Treatment**	**D Setting of Care**	
Amended	4	1	3	-	**8**
TOTAL ALL	**6**	**1**	**12**	**4**	**23**

Note: The following categories are not shown in the table above: not changed, reviewed; deleted, reviewed; not changed, not reviewed; and deleted, not reviewed. These rows were removed from the table for clarity because they contained no entries.

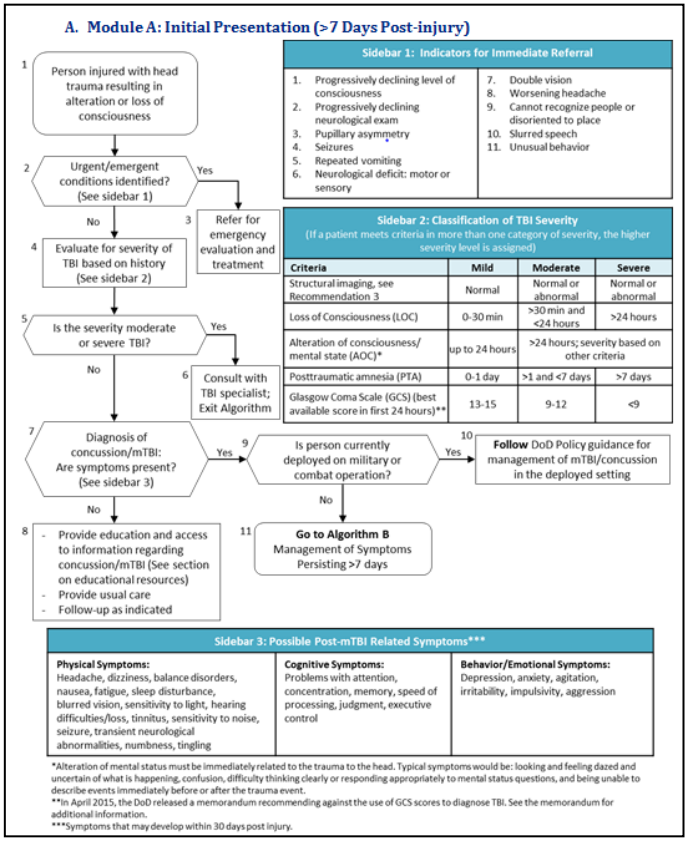
Clinical Algorithm

- Used in the CPG to help assess the critical information needed at major clinical decision making points.
- Diagrams a step-by-step sequential decision tree and standardized symbols display each step.
- Arrows connect the numbered boxes indicating the order in which the steps need to be followed

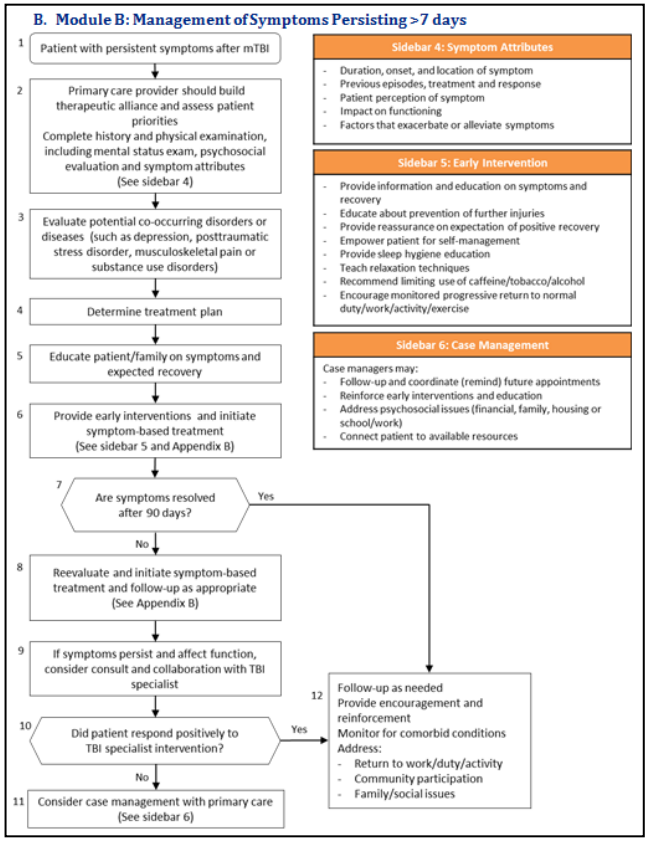
	Rounded rectangles represent a clinical state or condition.
	Hexagons represent a decision point in the guideline, formulated as a question that can be answered Yes or No.
	Rectangles represent an action in the process of care.

Algorithms in the 2016 CPG mTBI

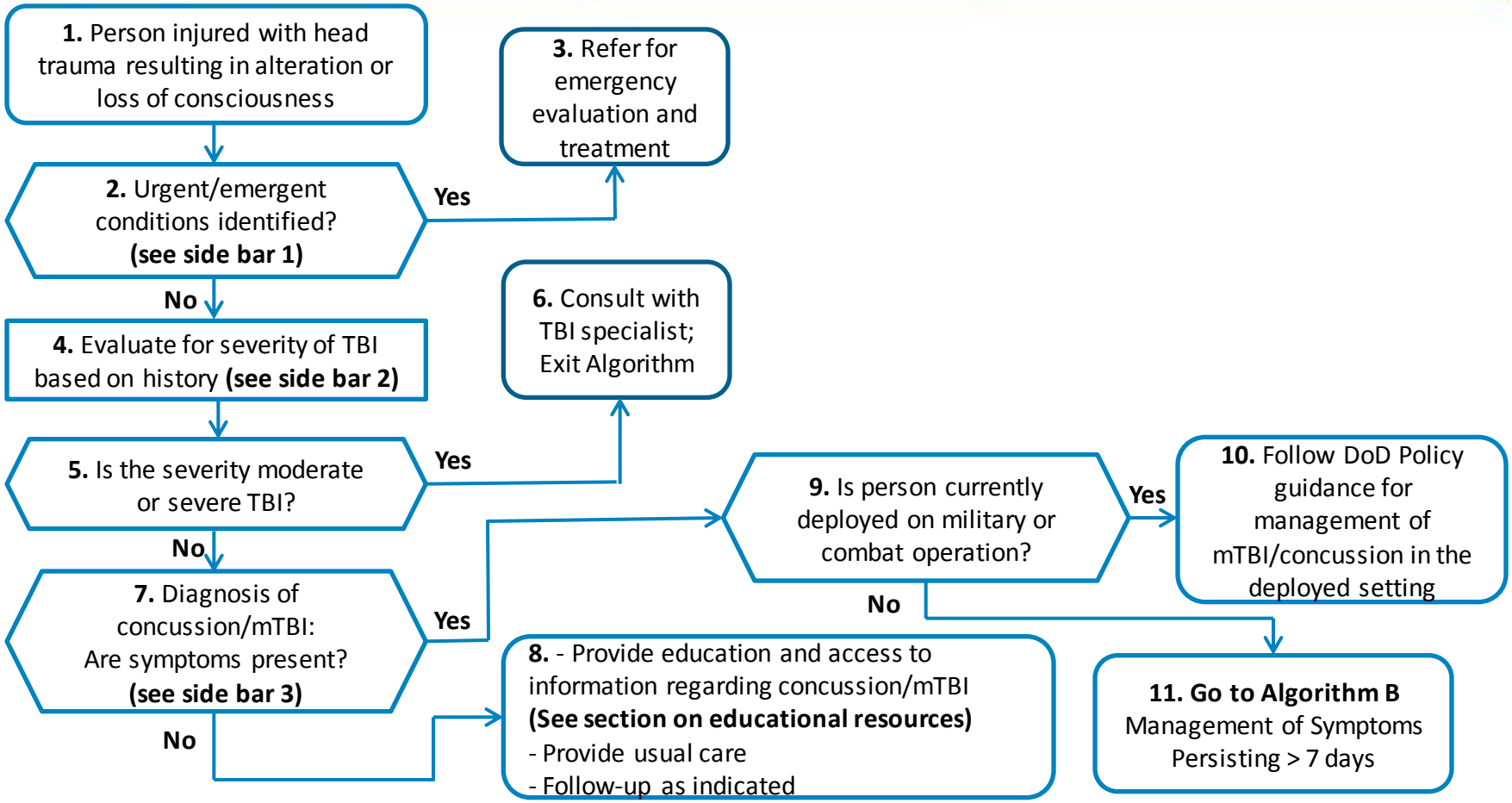
Module A: Initial presentation (>7 days post injury)



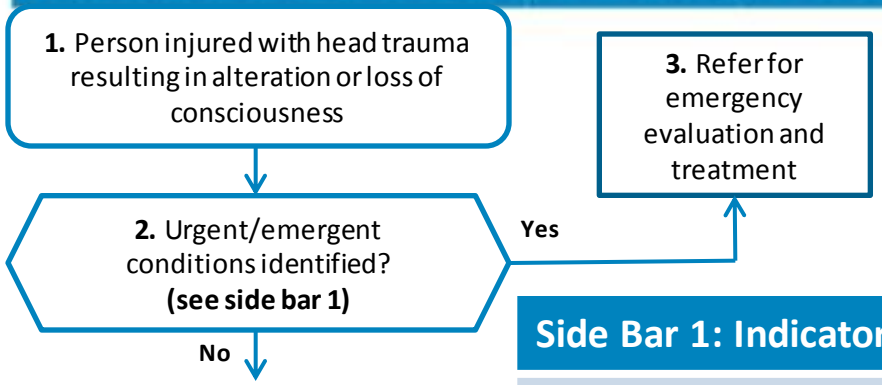
Module B: Management of Symptoms Persisting >7 days



Module A: Initial Presentation

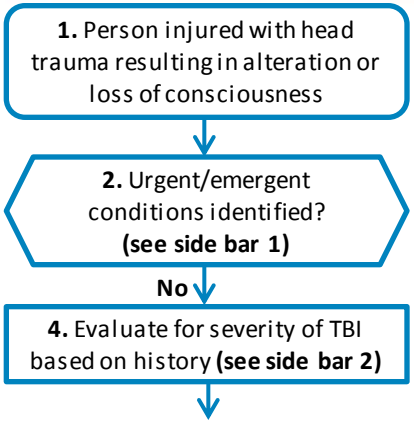


Initial Presentation: Identify urgent/emergent conditions



Side Bar 1: Indicators for Immediate Referral	
1. Progressively declining level of consciousness	2. Progressively declining neurological exam
3. Pupillary asymmetry	4. Seizures
5. Repeated vomiting	6. Neurological deficit: motor or sensory
7. Double vision	8. Worsening headache
9. Cannot recognize people or disoriented to place	10. Slurred speech
11. Unusual behavior	

Initial Presentation: Evaluate for TBI severity



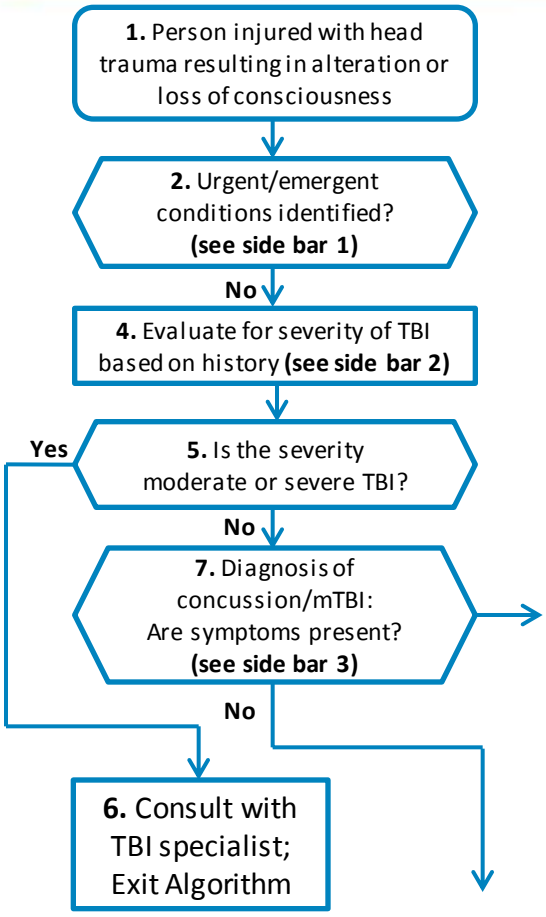
Side Bar 2: Classification of TBI Severity

(If a patient meets criteria in more than one category of severity, the higher severity level is assigned)

Criteria	Mild	Moderate	Severe
Structural imaging	Normal	Normal or abnormal	Normal or abnormal
Loss of Consciousness (LOC)	0-30 min	>30 min and <24 hrs	>24 hr
Alteration of consciousness/ mental state (AOC)*	up to 24 hrs	>24 hours; severity based on other criteria	>24 hrs; severity based on other criteria
Posttraumatic amnesia (PTA)	0-1 day	>1 and <7 days	>7 days
Glasgow Coma Scale (GCS) (best available score in first 24 hours)**	13-15	9-12	<9

*Alteration of mental status must be immediately related to the trauma to the head. Typical symptoms would be: looking and feeling dazed and uncertain of what is happening, confusion, difficulty thinking clearly or responding appropriately to mental status questions, and being unable to describe events immediately before or after the trauma event.
**In April 2015, the DoD released a memorandum recommending against the use of GCS scores to diagnose TBI. See the memorandum for additional information.[1]

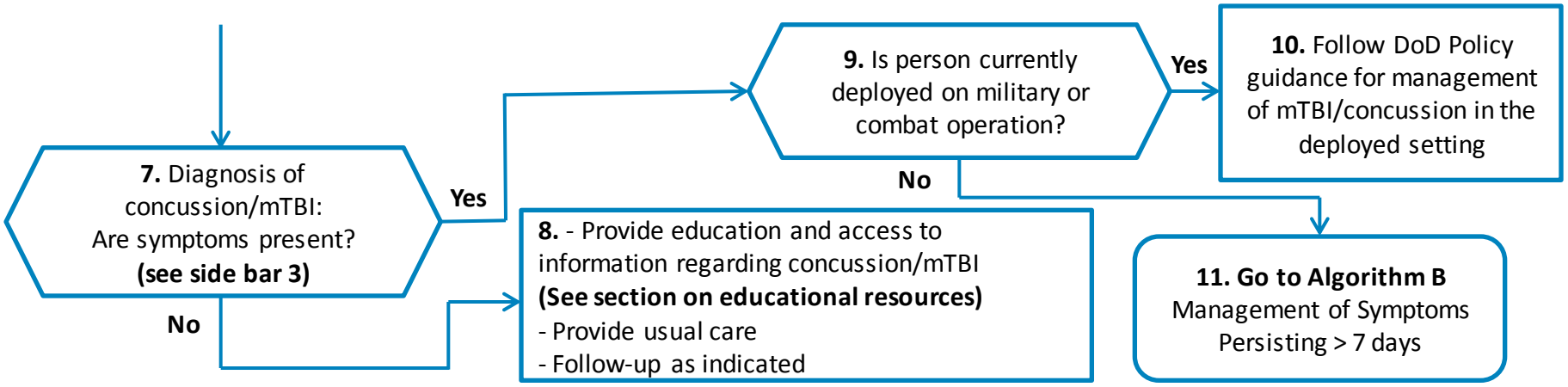
Initial Presentation: Determine presence of symptoms



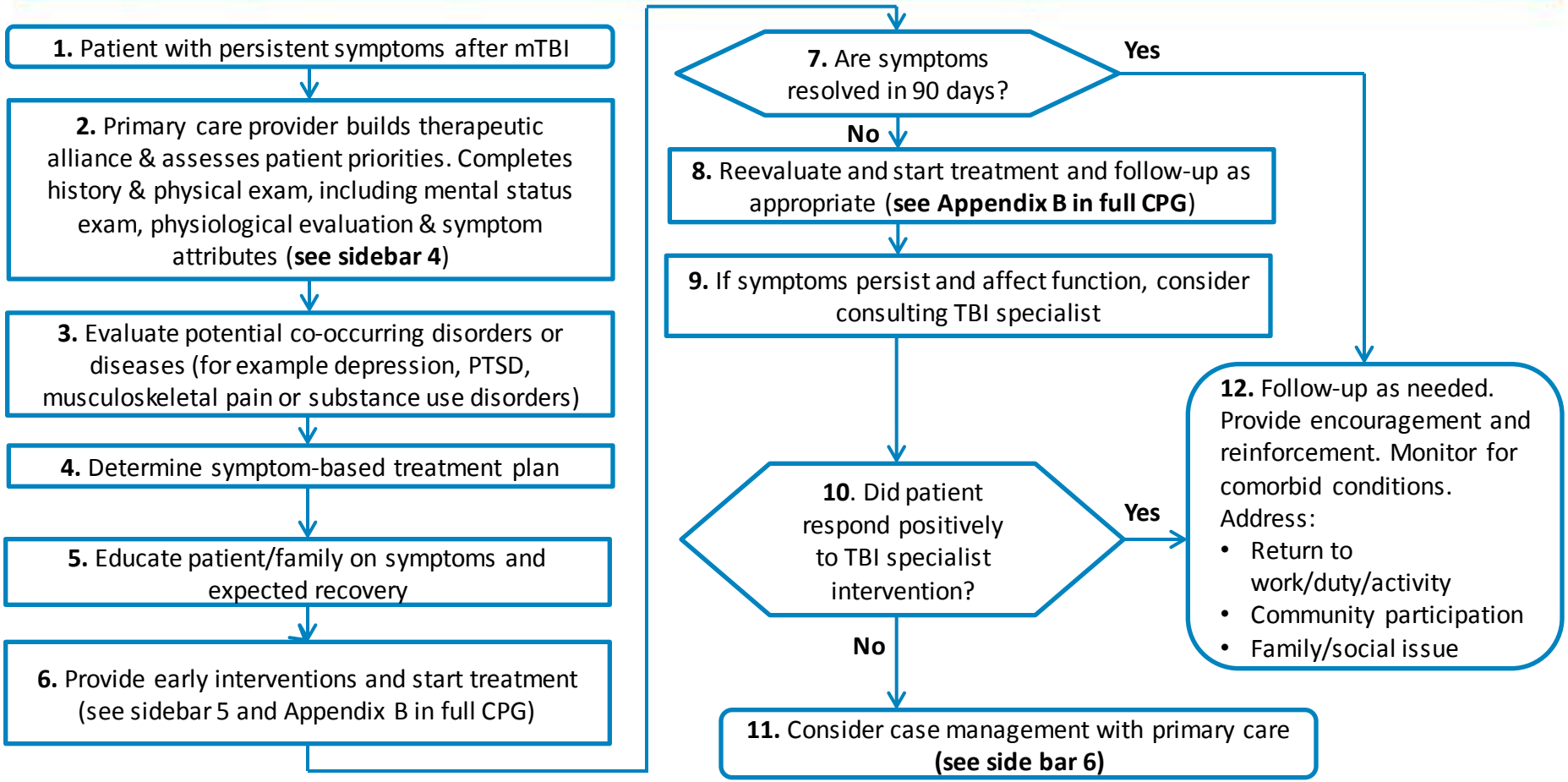
Side Bar 3: Possible Post mTBI Related Symptoms*		
Physical Symptoms:	**Cognitive Symptoms:**	**Behavior/Emotional Symptoms:**
Headache, dizziness, balance disorders, nausea, fatigue, sleep disturbance, blurred vision, sensitivity to light, hearing difficulties/loss, tinnitus, sensitivity to noise, seizure, transient neurological abnormalities, numbness, tingling	Problems with attention, concentration, memory, speed of processing, judgment, executive control	Depression, anxiety, agitation, irritability, impulsivity, aggression

*Symptoms that may develop within 30 days post injury.

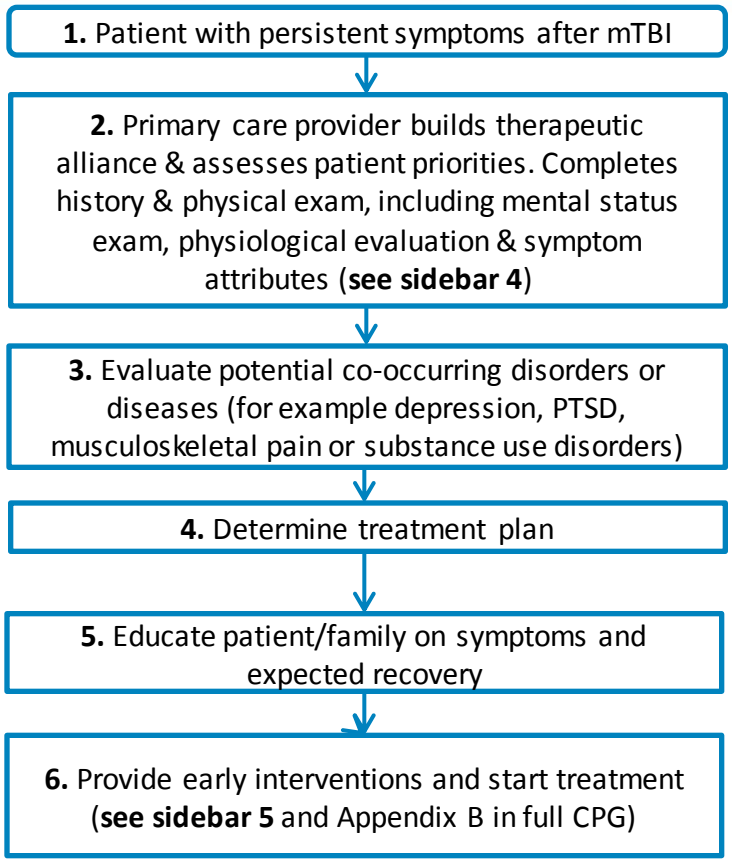
Initial Presentation: Determine Symptom Management



Module B: Management Symptoms Persisting >7 Days



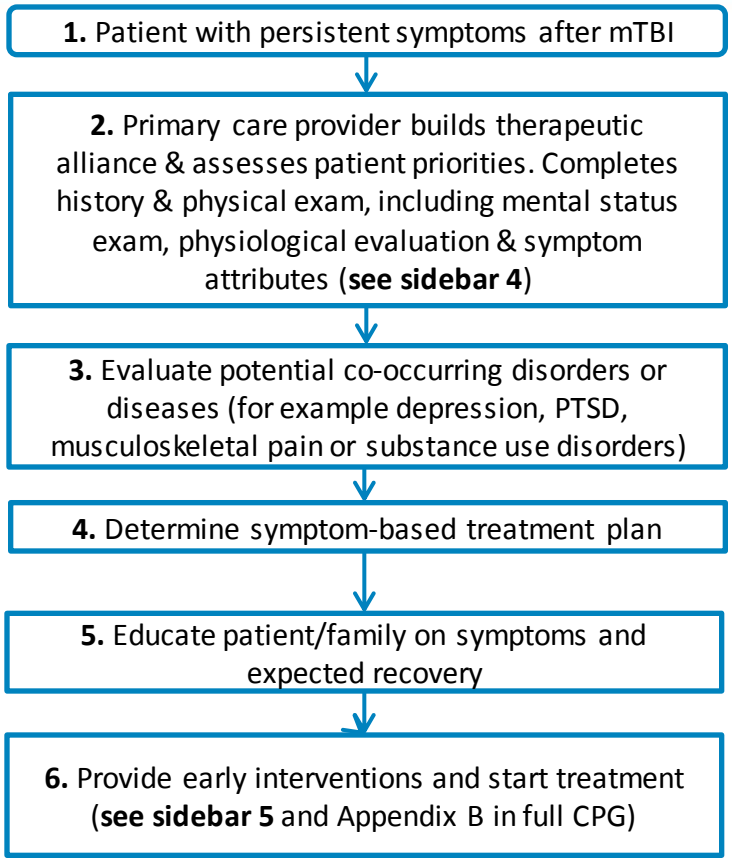
Management of Symptoms Persisting > 7 days: Assess, Evaluate, Educate



Sidebar 4: System Attributes

- Duration, onset, and location of symptom
- Previous episodes, treatment and response
- Patient perception of symptom
- Impact on functioning
- Factors that exacerbate or alleviate symptoms

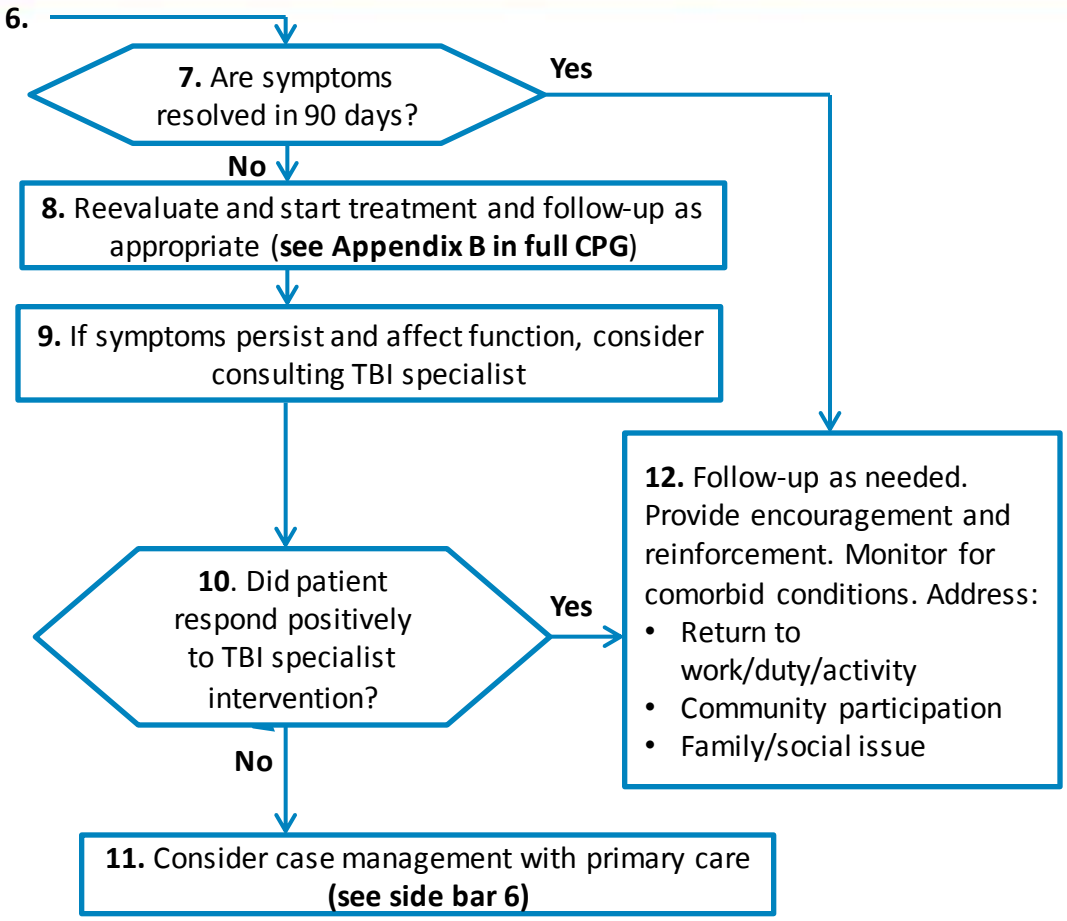
Management of Symptoms Persisting > 7 days: Provide early intervention



Sidebar 5: Early Intervention

- Provide information and education on symptoms and recovery
- Educate about prevention of further injuries
- Provide reassurance on expectation of positive recovery
- Empower patient for self-management
- Provide sleep hygiene education
- Teach relaxation techniques
- Recommend limiting use of caffeine/tobacco/alcohol
- Encourage monitored progressive return to normal duty/work/activity/exercise

Management of Symptoms Persisting > 7 days: Follow-up or Case Management



Sidebar 6: Case Management

Case managers may:

- Follow-up and coordinate (remind) future appointments
- Reinforce early interventions and education
- Address psychosocial issues (financial, family, housing or school/work)
- Connect patient to available resources

Polling Question

What is your role in the management of Veterans with Concussion/mild TBI?

a) Primary Care

b) Rehabilitation

c) Mental Health

c) Medical specialty (Neurology, Ophthalmology, etc)

d) Other

Diagnosis and Assessment

Recommendation	Strength*	Category †
1. We suggest +-using the terms "history of mild traumatic brain injury (mTBI)" or "concussion" and to refrain from using the terms "brain damage" or "patients with mTBI" in communication with patients and the public.	Weak for	Amended, not reviewed
2. We recommend evaluating patients presenting symptoms /complaints that may relate to mTBI at initial presentation.	Strong for	Amended, not reviewed
3. Excluding patients with indicators for immediate referral, for patients identified by post-deployment screening or who present to care with symptoms or complaints potentially related to brain injury, we suggest against using the following tests to establish the diagnosis of mTBI or direct the care of patients with a history of mTBI: **a.** Neuroimaging **b.** Serum biomarkers, including S100 calcium-binding protein B (S100-B), glial fibrillary acidic protein (GFAP), ubiquitin carboxyl-terminal esterase L1 (UCH-L1), neuron specific enolase (NSE), and α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptor (AMPAR) peptide **c.** Electroencephalogram (EEG)	Weak against	Amended, not reviewed

*For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Diagnosis and Assessment *continued*

Recommendation	Strength*	Category †
4. We recommend against performing comprehensive neuropsychological/ cognitive testing during the first 30 days following mTBI. For patients with symptoms persisting after 30 days, see Recommendation 17.	Strong against	Amended, not reviewed
5. For patients identified by post-deployment screening or presenting symptoms/complaints that may relate to mTBI, we recommend against using the following tests in routine diagnosis and care of patients with mTBI symptoms : a. Comprehensive , focused neuropsychological tests, including Automated Neuropsychological Assessment Metrics (ANAM), Neuro-Cognitive Assessment Tool (NCAT), or Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT)	Strong against	Reviewed, new-replaced
6. Patients whose symptoms appear >30 days after mTBI, we suggest a focused diagnostic work-up for specific symptoms .	Weak for	Amended, not reviewed

*For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Co-occurring Conditions

Recommendation	Strength*	Category†
7. We recommend assessing patients with symptoms attributed to mTBI for psychiatric symptoms and comorbid psychiatric disorders including major depressive disorder (MDD), posttraumatic stress disorder (PTSD), substance use disorders (SUD) and suicidality. Consult appropriate VA/DoD clinical practice guidelines.	Strong for	Amended, not reviewed

*For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Treatment Etiology Effects

	Recommendation	Strength*	Category †
General	**8.** We suggest considering, and offering as appropriate, a primary care, symptom-driven approach in the evaluation and management of patients with a history of mTBI and persistent symptoms.	Weak for	Amended, not reviewed
a) Etiology effect on Options & Outcomes	**9.** We recommend not adjusting treatment strategy based on mechanism of injury.	Strong against	New-added, reviewed
a) Etiology effect on Options & Outcomes	**10.** We recommend not adjusting outcome prognosis based on mechanism of injury.	Strong against	New-added, reviewed

* For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Treatment Headache

	Recommendation	Strength*	Category †
b) Headache	**11.** We suggest that the treatment of headaches should be individualized and tailored to the clinical features and patient preferences. The treatment may include: **a.** Headache education including topics such as stimulus control, use of caffeine/tobacco/alcohol and other stimulants **b.** Non-pharmacologic interventions such as sleep hygiene education, dietary modification, physical therapy (PT), relaxation and modification of the environment (for specific components for each symptom, see Appendix B: Clinical Symptom Management) **c.** Pharmacologic interventions as appropriate both for acute pain and prevention of headache attacks	Weak for	New-replaced, reviewed,

* For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Symptom Management Headache

Symptom	Non Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Headache *(treatment approach is dependent upon headache type)*	▪ Education including topics such as: • stimulus control • sleep hygiene • dietary modification • environment modifications ▪ Physical therapy (for tension headaches of cervical origin) ▪ Biofeedback ▪ Integrative medicine ▪ Cognitive behavioral therapy ▪ Extracranial pressure ▪ Thermal therapies	**Tension-like Abortive:** NSAIDS, aspirin, acetaminophen, combination medications (aspirin, acetaminophen, caffeine and a sedative drug) **Tension-like Preventive:** Tricyclic antidepressants, beta-blockers (propranolol), anti-convulsants (topiramate), tizanidine **Migraine-like Abortive:** NSAIDS, serotonin 5-HT receptor agonist, aspirin, acetaminophen, antiemetic agents, combination medications **Migraine-like Preventive:** Anti-convulsants (gabapentin, topiramate, divalproex sodium), beta-blockers, alpha-blockers, tricyclic antidepressants, magnesium oxide, vitamin B2	▪ Neurology ▪ Pain clinic

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs.

Treatment Recommendations and Symptom Management: Tinnitus

	Recommendation	Strength*	Category †
d) Tinnitus	**13**. There is no evidence to suggest for or against the use of any particular modality for the treatment of tinnitus after mTBI.	N/A	New-added, reviewed

Symptom	Non Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Tinnitus	▪ Trial of tinnitus management (e.g., white noise generator, biofeedback, hypnosis, relaxation therapy); prolonging therapy without patient improvement is strongly discouraged	-	▪ ENT

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs

* For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Symptom Management Hearing Difficulties

Symptom	Non Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Hearing difficulties	▪ Reassurance ▪ Pain management ▪ Controlling environmental noise ▪ White noise generators	-	▪ ENT ▪ Audiology

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs

Treatment Recommendations and Symptom Management Visual Symptoms

	Recommendation	Strength*	Category †
e) Visual Symptoms	**14.** There is no evidence to suggest for or against the use of any particular modality for the treatment of visual symptoms such as diplopia, accommodation or convergence disorder, visual tracking deficits and/or photophobia after mTBI.	N/A	New-added, reviewed

Symptom	Non Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Visual symptoms	▪ Trial of specific visual rehabilitation; prolonging therapy without patient improvement is strongly discouraged ▪ Pain management ▪ Controlling environmental light	-	▪ Optometry ▪ Ophthalmology ▪ Neuro-ophthalmology ▪ Neurology ▪ Vision rehabilitation

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs.

* For additional information, please refer to Grading Recommendations in the CPG.
† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Red Flags for Visual Symptoms

Primary care providers need to be keenly aware of potential reasons for an urgent referral to an eye care provider in cases of vision loss or decline,

- diplopia, abnormal pupils, abnormal external eye exam
- abnormal visual behavior (e.g., unexpectedly bumping into things)
- abnormal eye movements (e.g., nystagmus)
- acute ocular symptoms (e.g., evidence of trauma, severe eye pain, flashes and/or floaters, severe photophobia)

(for more information refer to Appendix B – Clinical Symptom Management)

Treatment Sleep Disturbance

	Recommendation	Strength*	Category †
f) Sleep Disturbance	**15.** We suggest that treatment of sleep disturbance be individualized and tailored to the clinical features and patient preferences, including the assessment of sleep patterns, sleep hygiene, diet, physical activities and sleep environment. The treatment may include, in order of preference: **a.** Sleep education including education about sleep hygiene, stimulus control, use of caffeine/tobacco/alcohol and other stimulants **b.** Non-pharmacologic interventions such as cognitive behavioral therapy specific for insomnia (CBTi), dietary modification, physical activity, relaxation and modification of the sleep environment (for specific components for each symptoms see Appendix B: Clinical Symptom Management) **c.** Pharmacologic interventions as appropriate to aid in sleep initiation and sleep maintenance	Weak for	Amended, reviewed

See mTBI CPG Appendix B, and DCoE Management of Sleep Disturbances Following Concussion/mTBI

* For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG

Symptom Management — Sleep Disturbance

Symptom	Non Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Sleep disturbance	▪ Education including topics such as: • stimulus control • sleep hygiene • dietary modification • sleep environment modification ▪ Cognitive behavioral therapy specific for insomnia ▪ Physical activity ▪ Relaxation	▪ Short-term use of trazodone, mirtazapine, and tricyclic antidepressants	▪ Mental health ▪ PM&R ▪ Neurology

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs.

*The three sleep disturbance sub-types that drive recommended treatment are:

- Insomnia
- Circadian Rhythm Sleep Wake Disturbance (CRSWD)
- Obstructive Sleep Apnea (OSA)

*Source: DCoE Clinical Recommendation: June 2014. Management of Sleep Disturbances Following Concussion/mTBI

Treatment Recommendations and Symptom Management Behavioral

	Recommendation	Strength*	Category †
g) Behavioral Symptoms	**16**. We recommend that the presence of psychological or behavioral symptoms following mTBI should be evaluated and managed according to existing evidence-based clinical practice guidelines, and based upon individual factors and the nature and severity of symptoms.	Strong for	Amended, reviewed

Symptom	Non Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Behavioral symptoms	*See applicable VA/DoD CPGs* ▪ Cognitive behavioral therapy	*See applicable VA/DoD CPGs*	

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs .

* For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG

Treatment Dizziness/Disequilibrium

	Recommendation	Strength*	Category †
c) Dizziness & Disequilibrium	**12.** In individuals with a history of mTBI who present with functional impairments due to dizziness, disequilibrium, and spatial disorientation symptoms, we suggest that clinicians offer a short-term trial of specific vestibular, visual, and proprioceptive therapeutic exercise to assess the individual's responsiveness to treatment. Refer to occupational therapy (OT), physical therapy (PT) or other vestibular trained care provider as appropriate. *A prolonged course of therapy in the absence of patient improvement is strongly discouraged.*	Weak for	Amended, reviewed

* For additional information, please refer to Grading Recommendations in the CPG.
† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG.

Symptom Management Dizziness/Disequilibrium

Symptom	Non-Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Dizziness and dis-equilibrium	▪ Trial of vestibular, visual, and proprioceptive therapeutic exercise; a prolonged course of therapy in the absence of patient improvement is strongly discouraged	▪ Medications should only be considered if symptoms are severe enough to significantly limit functional activities; trials should be brief and optimally less than a week ▪ Vestibular suppressants; first-line medication: meclizine, followed by scopolamine and dimenhydrinate	▪ ENT ▪ Neurology ▪ Physical therapy

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs

Treatment Cognitive Symptoms

	Recommendation	Strength*	Category †
h) Cognitive Symptoms	**17.** We suggest that patients with a history of mTBI who report cognitive symptoms that do not resolve within 30-90 days and have been refractory to treatment for associated symptoms (e.g., sleep disturbance, headache) be referred as appropriate for a structured cognitive assessment or neuropsychological assessment to determine functional limitations and guide treatment.	Weak for	Amended, not reviewed

* For additional information, please refer to Grading Recommendations in the CPG.

† For additional information, please refer to Recommendation Categorization and Appendix E: 2009 Recommendation Categorization in the CPG

Treatment Cognitive Symptoms *continued*

	Recommendation	Strength*	Category †
h) Cognitive Symptoms	**18.** We suggest that individuals with a history of mTBI who present with symptoms related to memory, attention or executive function problems that do not resolve within 30-90 days and have been refractory to treatment for associated symptoms should be referred as appropriate to cognitive rehabilitation therapists with expertise in TBI rehabilitation. We suggest considering a short-term trial of cognitive rehabilitation treatment to assess the individual patient responsiveness to strategy training, including instruction and practice on use of memory aids, such as cognitive assistive technologies (AT). *A prolonged course of therapy in the absence of patient improvement is strongly discouraged.*	Weak for	New-replaced, reviewed
h) Cognitive Symptoms	**19**. We suggest ***against*** offering medications, supplements, nutraceuticals or herbal medicines for ameliorating the neurocognitive effects attributed to mTBI	Weak against	Amended, not reviewed

* For additional information, please refer to Grading Recommendations in the CPG.

† *For additional information, please refer to Recommendation Categoriza*tion and Appendix E: 2009 Recommendation Categorization in the CPG

Symptom Management — Cognitive Symptoms

Symptom	Non-Pharmacologic Treatment	Pharmacologic Treatment	Referral After Failed Response to Treatment
Cognitive symptoms	▪ Trial of cognitive rehabilitation ▪ Psychoeducation ▪ Supportive stress management ▪ Cognitive-behavioral interventions ▪ Motivational interviewing	-	▪ Cognitive rehabilitation

Abbreviations: CPG: clinical practice guideline; DoD: Department of Defense; ENT: ear, nose and throat specialist; mTBI: mild traumatic brain injury; NSAIDs: nonsteroidal anti-inflammatory drugs; PM&R: physical medicine and rehabilitation; VA: Department of Veterans Affairs .

Setting of Care

Recommendation	Strength*	Category †
20. We suggest against routine referral to specialty care in the majority of patients with a history of mTBI.	Weak against	Amended, reviewed
21. If the patient's symptoms do not resolve within 30-90 days and are refractory to initial treatment in primary care and significantly impact activities of daily living (ADLs), we suggest consultation and collaboration with a locally designated TBI or other applicable specialist.	Weak for	Amended, reviewed
22. For patients with persistent symptoms that have been refractory to initial psychoeducation and treatment, we suggest referral to case managers within the primary care setting to provide additional psychoeducation, case coordination and support.	Weak for	Amended, reviewed
23. There is insufficient evidence to recommend for or against the use of interdisciplinary/multidisciplinary teams in the management of patients with chronic symptoms attributed to mTBI.	N/A	New-replaced, reviewed

* For additional information, please refer to Grading Recommendations in the CPG.

† *For additional information, please refer to Recommendation Categoriza*tion and Appendix E: 2009 Recommendation Categorization in the CPG

References and resources

- **VA/DoD CPG of mTBI**
  - http://www.healthquality.va.gov/guidelines/Rehab/mtbi/
- **Defense Centers of Excellence (DCoE)**
  - http://www.dcoe.mil/TraumaticBrainInjury.aspx
- **Mild Traumatic Brain Injury Rehabilitation Toolkit**
  - http://www.cs.amedd.army.mil/borden/Portlet.aspx?ID=065de2f7-81c4-4f9d-9c85-75fe59dbae13
- **Defense and Veterans Brain Injury Center (DVBIC)**
  - DVBIC Patient and Provider Educational Materials
    - http://dvbic.dcoe.mil/resources
  - DVBIC Publications List
    - http://dvbic.dcoe.mil/research/browse/dvbic-publications

Questions and Answer

Contact information

COL Geoffrey Grammer
goeffrey.g.grammer.mil@mail.mil

Dr. Tom DeGraba
thomas.j.degraba.civ@mail.mil

Ms. Linda Picon
linda.picon@va.gov

Back Up Slides

Background to the CPG mTBI

2004	2009
• VA and DoD Evidence-Based Practice working group established • Mission: Improve health of all service members by developing Clinical Practice Guidelines • Purpose: Provide a framework for care providers to evaluate, treat, and manage needs and preferences of individuals with a history of mTBI	• CPG for the management of Concussion-mTBI published by VA/DoD. • Based on comprehensive systematic review of evidence on adults with TBI in VA/DoD clinical settings through 2008

Background (cont.)

2014

- Process to update the 2009 mTBI CPG was initiated

2016

- Update CPG for mTBI was published in March.
- Provides evidence-based management of patients with a history of TBI
- Intent is to assist primary and other health care providers in the management of all aspects of patient care

Table of Contents

Table of Contents (continued)

Table of Contents (continued 2)

Table of Contents (continued 3)

Table of Contents (continued 4)

2016 VA/DoD Definition of TBI

A traumatic brain injury (TBI) is a traumatically induced structural injury and/or physiological disruption of brain function as a result of an external force and is indicated by new onset or worsening of at least one of the following clinical signs immediately following the event:

- Any period of loss of or decreased level of consciousness
- Any loss of memory for events immediately before or after the injury (posttraumatic amnesia)
- Any alteration in mental state at the time of the injury (e.g., confusion, disorientation, slowed thinking, alteration of consciousness/mental state)
- Neurological deficits (e.g., weakness, loss of balance, change in vision, praxis, paresis/plegia, sensory loss, aphasia) that may or may not be transient
- Intracranial lesion

Classification of TBI Severity[§]

Criteria	Mild	Moderate	Severe
Structural imaging	Normal	Normal or abnormal	Normal or abnormal
Loss of Consciousness (LOC)	0-30 min	>30 min and <24 hrs	>24 hrs
Alteration of consciousness/ mental state (AOC)*	up to 24 hrs	>24 hours; severity based on other criteria	>24 hrs; severity based on other criteria
Posttraumatic amnesia (PTA)	0-1 day	>1 and <7 days	>7 days
Glasgow Coma Scale (GCS) (best available score in first 24 hours)**	13-15	9-12	<9

[§]If a patient meets criteria in more than one category of severity, the higher severity level is assigned
*Alteration of mental status must be immediately related to the trauma to the head. Typical symptoms would be: looking and fe eling dazed and uncertain of what is happening, confusion, difficulty thinking clearly or responding appropriately to mental status questions , and being unable to describe events immediately before or after the trauma event.
**In April 2015, the DoD released a memorandum recommending against the use of GCS scores to diagnose TBI. See the memorandum for additional information.[1]