Module A: Initial Presentation (>7 Days Post-injury)

1. Person injured with head trauma resulting in alteration or loss of consciousness

2. Urgent/emergent conditions identified? (See sidebar 1)
   - Yes
   - Refer for emergency evaluation and treatment

3. No

4. Evaluate for severity of TBI based on history (See sidebar 2)

5. Is the severity moderate or severe TBI?
   - Yes
   - Consult with TBI specialist; Exit Algorithm
   - No

6. Diagnosis of concussion/mTBI: Are symptoms present? (See sidebar 3)
   - Yes
   - Is person currently deployed on military or combat operation?
     - Yes
     - Follow DoD Policy guidance for management of mTBI/concussion in the deployed setting
     - No
     - Go to Algorithm B

7. No

8. Provide education and access to information regarding concussion/mTBI (See section on educational resources)
   - Provide usual care
   - Follow-up as indicated

9. Is person currently deployed on military or combat operation?
   - Yes
   - Follow DoD Policy guidance for management of mTBI/concussion in the deployed setting
   - No
   - Go to Algorithm B

10. Management of Symptoms Persisting >7 days
Module B: Management of Symptoms Persisting >7 days

1. Patient with persistent symptoms after mTBI

2. Primary care provider should build therapeutic alliance and assess patient priorities
   Complete history and physical examination, including mental status exam, psychosocial evaluation and symptom attributes
   (See sidebar 4)

3. Evaluate potential co-occurring disorders or diseases (such as depression, posttraumatic stress disorder, musculoskeletal pain or substance use disorders)

4. Determine treatment plan

5. Educate patient/family on symptoms and expected recovery

6. Provide early interventions and initiate symptom-based treatment
   (See sidebar 5 and Appendix B in full CPG)

7. Are symptoms resolved after 90 days?
   Yes
   No

8. Reevaluate and initiate symptom-based treatment and follow-up as appropriate
   (See Appendix B in full CPG)

9. If symptoms persist and affect function, consider consult and collaboration with TBI specialist

10. Did patient respond positively to TBI specialist intervention?
    Yes
    No

11. Consider case management with primary care
    (See sidebar 6)

12. Follow-up as needed
    Provide encouragement and reinforcement
    Monitor for comorbid conditions
    Address:
    - Return to work/duty/activity
    - Community participation
    - Family/social issues
Sidebar 1: Classification of TBI Severity
(If a patient meets criteria in more than one category of severity, the higher severity level is assigned)

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

*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.

Sidebar 2: 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

Sidebar 3: Possible Post-mTBI Related Symptoms***

| Physical 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 |
| Cognitive Symptoms: Problems with attention, concentration, memory, speed of processing, judgment, executive control |
| Behavior/Emotional Symptoms: Depression, anxiety, agitation, irritability, impulsivity, aggression |

***Symptoms that may develop within 30 days post injury.

Sidebar 4: Symptom 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

### 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

### 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
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Non-Pharmacologic Treatment</th>
<th>Pharmacologic Treatment</th>
<th>Referral After Failed Response to Treatment</th>
</tr>
</thead>
</table>
| 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 | - Abortive:  
  NSAIDS, aspirin, acetaminophen, combination medications (aspirin, acetaminophen, caffeine and a sedative drug)  
  - Preventive:  
  Tricyclic antidepressants, beta-blockers (propranolol), anti-convulsants (topiramate), tizanidine | Neurology, Pain clinic |
| Headache (treatment approach is dependent upon headache type) | - Abortive:  
  NSAIDS, serotonin 5-HT receptor agonist, aspirin, acetaminophen, antiemetic agents, combination medications | - Preventive:  
  Anti-convulsants (gabapentin, topiramate, divalproex sodium), beta-blockers, alpha-blockers, tricyclic antidepressants, magnesium oxide, vitamin B2 | |
| Dizziness and disequilibrium                  | - 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 |
<p>| Tinnitus                                     | - Trial of tinnitus management (e.g., white noise generator, biofeedback, hypnosis, relaxation therapy); a prolonged course of therapy in the absence of patient improvement is strongly discouraged | | ENT |</p>
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| **Visual symptoms** | ■ Trial of specific visual rehabilitation; a prolonged course of therapy in the absence of patient improvement is strongly discouraged  
■ Pain management  
■ Controlling environmental light | ■ Short-term use of trazodone, mirtazapine, and tricyclic antidepressants | ■ Optometry  
■ Ophthalmology  
■ Neuro-ophthalmology  
■ Neurology  
■ Vision rehabilitation |
| **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 | | |
| **Behavioral symptoms** | See applicable VA/DoD CPGs  
■ Cognitive behavioral therapy | See applicable VA/DoD CPGs | |
| **Cognitive symptoms** | ■ Trial of cognitive rehabilitation  
■ Psychoeducation  
■ Supportive stress management  
■ Cognitive-behavioral interventions  
■ Motivational interviewing | | Cognitive rehabilitation |
| **Fatigue** | ■ Education  
■ Cognitive behavioral therapy  
■ Physical therapy  
■ Promotion of sleep hygiene  
■ Encouragement of regular exercise | | |
| **Hearing difficulties** | ■ Reassurance  
■ Pain management  
■ Controlling environmental noise  
■ White noise generators | | ENT  
■ Audiology |
| **Smell (olfactory deficits)** | ■ Flavor/spice food to enhance taste  
■ Monitor patient weight  
■ Provide specific safety education | | 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