ATTACHMENT 2 (CONCUSSION MANAGEMENT IN THE GARRISON SETTING ALGORITHMS) TO HQDA EXORD DA GUIDANCE FOR MANAGEMENT OF CONCUSSION/MILD TRAUMATIC BRAIN INJURY IN THE GARRISON SETTING

1. **General:** Implementation of *Policy Guidance for Management of Concussion/mTBI in the Garrison Setting* requires Soldiers, leaders, medics, and healthcare providers to understand mandates following a potentially concussive event.

2. **Purpose:** The purpose of this ATTACHMENT 2 is to provide concussion management algorithms for medics and provides in other to identify, treat, and monitor concussion/mTBI as close to the time of injury as possible.

3. **Overview:** The next 8 pages contain the concussion management algorithms guiding garrison medical care at the time of injury to 7 days.

4. **Ordering Information:** medical personnel can request additional hard copies of the algorithms and the Military Acute Concussion Evaluation through the Defense and Veterans Brain Injury Center’s website [www.dvbic.org](http://www.dvbic.org) or through e-mail [info@dvbic.org](mailto:info@dvbic.org)
Concussion Management in the Garrison Setting
(time of injury to 7 days)

MEDIC ALGORITHM

Priority: Quickly assess for red flags

Traumatic Event or Head Injury Occurs: Concussion Possible

- Any red flags? B
  - Yes
    - Immediate provider consultation or hospital transport
  - No
    - Initiate MACE (complete questions 1 & 2)
  - Concussion possible?
    - Yes
      - Complete remainder of MACE
    - No
      - Normal MACE neurological exam?
        - Yes
          - MACE cognitive score < 25?
            - Yes
              - Symptoms C present?
                - No
                  - 2 or more concussions in the past 12 months?
                    - Yes
                      - Review acute concussion educational brochure (www.DVBIC.org) with patient
                    - No
                      - 24-hour post-injury reassessment: Symptoms C present?
                        - Yes
                          - Perform exertional testing F
                        - No
                          - Stop MACE, review history of concussion (MACE question 12)
                          - 3 or more concussions in the past 12 months?
                            - Yes
                              - Consult provider for possible hospital transport and document encounter in EMR
                              - Document concussion screening in EMR with ICD-9 code V80.01
                            - No
                              - Document concussion screening in EMR with ICD-9 code V80.01
                              - Refer to provider for possible recurrent concussion evaluation and disposition
                              - Communication with command
                        - No
                          - Stop MACE, review history of concussion (MACE question 12)
                          - Document concussion screening in EMR with ICD-9 code V80.01
                          - Consult provider if symptoms C present
                          - Immediate provider consultation
                          - Provider to complete e-Profile according to individual recovery
                          - Initial concussion management D
                          - Review acute concussion educational brochure (www.DVBIC.org) with patient
                          - Document encounter in EMR (include MACE 3-part score) with ICD-9 codes F
                          - Communicate with command
                          - Follow-up as necessary
                          - Document encounter in EMR with ICD-9 codes for subsequent visit E
                          - Communication with command
                          - Review acute concussion educational brochure (www.DVBIC.org) with patient
                          - Document encounter in EMR (include MACE 3-part score) with ICD-9 codes F
                          - Communicate with command
Concussion Management in the Garrison Setting
(time of injury to 7 days)

A Potentially Concussive Events Requiring Concussion Evaluation:

1. Involvement in a vehicle collision or rollover
2. A blow to the head during activities such as training, sporting/recreational activities, or combatives
3. Within 50 meters of a blast (inside or outside)
4. Command-directed: such as, but not limited to, repeated exposures to the events listed above, and in accordance with environmental sensor (i.e. helmet sensor, blast gauge, etc.) protocols

B Medic Algorithm Red Flags:

1. Witnessed loss of consciousness (LOC)
2. Two or more potentially concussive events within 72 hours
3. Unusual behavior/combative
4. Unequal pupils
5. Seizures
6. Repeated vomiting
7. Double vision/loss of vision
8. Worsening headache
9. Weakness on one side of the body
10. Cannot recognize people or disoriented to place
11. Abnormal speech

C Medic Algorithm Symptoms:

1. Headache
2. Dizziness
3. Memory problems
4. Balance problems
5. Nausea/vomiting
6. Difficulty concentrating
7. Irritability
8. Visual disturbances
9. Ringing in the ears
10. Other

D Medic Initial Management of Concussion:

1. Mandatory 24-hour recovery period for 1st concussion within the past 12 months
2. Mandatory 7-day recovery period after symptom resolution for 2 or more concussions within the last 12 months
3. Review acute concussion educational brochure with all concussion patients, available at www.DVBIC.org
4. Reduce environmental stimuli
5. Consult with provider regarding duty restrictions using standardized enterprise templates (e-Profile)
6. Aggressive headache management
   - Use acetaminophen q 6 hrs x 48 hrs. After 48 hours, may use naproxen pm
7. Avoid tramadol, Fioricet, excessive triptans (prescribed for migraines) and narcotics

E Concussion Coding Tips (these coding tips only apply to Garrison concussions and do NOT apply to moderate, severe, or penetrating TBI or TBIs that occur in the deployed setting):

Initial Encounter
1. Primary code (medics require provider co-signature)
   - 850.0 – Concussion without LOC
   - 850.11 – Concussion with LOC ≤ 30 min
2. Personal history of TBI unrelated to GWOT
   - V15.52_7 – Injury unrelated to GWOT, mild TBI
3. Symptom codes (as appropriate)
4. Screening code for TBI (V80.01)
5. External cause of injury code (appropriate E-code)

E Concussion Coding Tips (continued):

Subsequent Encounter
1. Symptom codes (as appropriate)
2. Personal history of TBI unrelated to GWOT
   - V15.52_7 – Injury unrelated to GWOT, mild TBI
3. Late effect code
   - 905.0 – Late effect of intracranial injury with skull or facial fracture
   - 907.0 – Late effect of intracranial injury without skull or facial fracture
4. Other ICD-9 codes as appropriate

F Exertional Testing:

1. Exert to 65-85% of target heart rate (THR=220-age) using push-ups, sit-ups, running in place, step aerobics, stationary bike, treadmill and/or hand crank
2. Maintain this level of exertion for approximately 2 minutes
3. Assess for symptoms (headache, vertigo, photophobia, dizziness, nausea, visual changes, etc.)
4. If symptoms/red flags exist with exertional testing, stop testing and consult with provider

ADDITIONAL INFORMATION

Definition of Concussion:

Results from a direct blow or jolt to the head, blast exposure, or other head injury followed by at least one of the following (even momentarily):

- Alteration of Consciousness (AOC) ≤ 24 hours
  - Having one’s “bell rung,” being dazed/confused, or “seeing stars”
- Loss of Consciousness (LOC) 0-30 minutes
  - Temporarily blacked out
- Post-Traumatic Amnesia (PTA) ≤ 24 hours
  - Memory loss

Acronyms:

- AOC Alteration of consciousness
- EMR Electronic medical record
- GWOT Global War on Terrorism
- ICD-9 International Classification of Diseases – 9th revision
- LOC Loss of consciousness
- MACE Military Acute Concussion Evaluation
- mTBI Mild traumatic brain injury
- PTA Post-traumatic amnesia
- RTD Return to duty
- THR Target heart rate
- TBI Traumatic brain injury

For additional copies or information call 1.866.966.1020 or email info@DVBIC.org
Concussion Management in the Garrison Setting
(time of injury to 7 days)

PROVIDER ALGORITHM

Traumatic Event or Head Injury Occurs: Concussion Possible

Any red flags and/or CT indications present?

Yes

Immediately refer as indicated:
- Specialty services
- Neuroimaging
- Laboratory

No new concussion

• Assess for and treat any other injuries or symptoms
• If 3 or more concussions in past 12 months, refer for recurrent concussion evaluation* if not already completed
• Document concussion screening in EMR with ICD-9 code V80.01

No

Confirm history of events, including any previous concussions in past 12 months
Initiate MACE (questions 1 & 2) if not already completed

New concussion

Complete remainder of MACE

Neuro exam abnormal and/or Cognitive score < 25 and/or Symptoms present?

Yes

Consult neurology if neuro exam abnormal
Review acute concussion educational brochure with patient
Determine minimum recovery period based on concussion history
Primary Care Management (PCM) up to 7 days with daily reassessment
Document encounter in EMR with ICD-9 codes
Complete e-Profile using standardized enterprise templates
Consider referral for post-injury NCAT prior to RTD

No

Review acute concussion educational brochure with patient
Determine minimum recovery period based on concussion history
Document encounter in EMR with ICD-9 codes
Complete e-Profile using standardized enterprise templates
Communicate with command

24-hour post-injury re-assessment: Symptoms present?

Yes

Continue Primary Care Management

Symptoms present after 7 days?

Yes

After completion of minimum recovery period perform exertional testing

No

Symptoms present following exertional testing?

Yes

• Consider referral for post-injury NCAT
• Complete e-Profile to reflect minimum recovery period for recurrent concussion and individual recovery
• Document encounter in EMR
• Communicate with command

No

If 3rd concussion in the past 12 months, refer for recurrent concussion evaluation*

No

• Confirm history of events, including any previous concussions in past 12 months
• Initiate MACE (questions 1 & 2) if not already completed

* See Recurrent Concussion Evaluation (Page 4)
Concussion Management in the Garrison Setting
(time of injury to 7 days)

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2. A blow to the head during activities such as training, sporting/recreational activities, or combatives
3. Within 50 meters of a blast (inside or outside)
4. Command-directed: such as, but not limited to, repeated exposures to the events listed above, and in accordance with environmental sensor (i.e. helmet sensor, blast gauge, etc.) protocols

B Provider Algorithm Red Flags:
1. Progressively declining level of consciousness
2. Progressively declining neurological status
3. Pupillary asymmetry
4. Seizures
5. Repeated vomiting
6. Clinically verified GCS < 15
7. Neurological deficit: motor or sensory
8. LOC > 5 minutes
9. Double vision
10. Worsening headache
11. Cannot recognize people or disoriented to place
12. Slurred speech
13. Unusual behavior

C CT Indications:* 
1. Physical evidence of trauma above the clavicles
2. Seizures
3. Vomiting
4. Headache
5. Age > 60
6. Drug or alcohol intoxication
7. Coagulopathy
8. Focal neurologic deficits


D Acute Concussion Educational Brochure:
Available at www.DVBIC.org

E Minimum Recovery Period:
- Mandatory 24-hour recovery period for 1st concussion within the past 12 months
- Mandatory 7-day recovery period after symptom resolution for 2 or more concussions within last 12 months

F Primary Care Management (PCM): (up to 7 days)
1. Review acute concussion educational brochure with all concussion patients, available at www.DVBIC.org
2. Reduce environmental stimuli
3. Mandatory 24-hour recovery period
4. Aggressive headache management
   - Use acetaminophen q 6 hrs x 48 hrs
   - After 48 hours may use naproxen pm
5. Avoid tramadol, Fioricet, excessive triptans and narcotics
6. Pain management if applicable
7. Consider referral for post-injury NCAT
8. Address any sleep issues. Ambien 10mg po QHS may be considered for short-term (2 weeks) sleep regulation.
9. Consult with specialist if needed
10. Utilize Progressive Return to Activity Clinical Recommendation (available at www.dcoe.health.mil or www.DVBIC.org)
11. Implement duty restrictions. Complete e-Profile using standardized enterprise templates and update as needed according to individual recovery.
12. Document encounter in EMR with ICD-9 codes
Concussion Management in the Garrison Setting (time of injury to 7 days)

G Concussion Coding Tips: (these coding tips only apply to garrison concussions and do NOT apply to moderate, severe, or penetrating TBI or TBIs that occur in the deployed setting)

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   - 907.0 – Late effect of intracranial injury without skull or facial fracture
4. Other ICD-9 codes as appropriate

H NeuroCognitive Assessment Tool (NCAT) Recommendation:

- The initial study should be administered between 24-72 hours after injury whenever possible
- It can also be repeated serially following post-injury symptom resolution to document neurocognitive recovery to baseline and to further inform the RTD assessment
- For Soldiers who remain symptomatic, serial NCAT testing (every 3-4 days) can be used to monitor cognitive recovery; however, cognitive recovery alone should not be the sole basis of RTD decision making
- ANAM is currently the primary NCAT used by the Army
- For ANAM baseline results, send requests to: Toll-free 1-855-630-7849 or e-mail usarmy.jbsa.medcom.mbx.otsg—anam-baselines@mail.mil
- ANAM help desk is staffed from 0800-1700 EST Monday - Friday

I Provider Algorithm Symptoms:

1. Confusion (24 hours)
2. Irritability
3. Unsteady on feet
4. Vertigo/dizziness
5. Headache
6. Photophobia
7. Phonophobia
8. Sleep issues

J Exertional Testing:

1. Exert to 65-85% of target heart rate (THR=220-age) using push-ups, sit-ups, running in place, step aerobics, stationary bike, treadmill and/or hand crank
2. Maintain this level of exertion for approximately 2 minutes
3. Assess for symptoms (headache, vertigo, photophobia, dizziness, nausea, visual changes, etc.)
4. If symptoms exist with exertional testing, stop testing and continue PCM. Document in EMR.
Concussion Management in the Garrison Setting
(time of injury to 7 days)

RECURRENT CONCUSSION EVALUATION
(Three or more documented concussions within the past 12 months)

1. Comprehensive neurological evaluation by a neurologist or other similarly qualified provider
   - Review of prior concussion history with focus on timeline or resolution of symptoms
   - Assessment of symptoms (face-to-face interview by provider)
     - Consider Neurobehavioral Symptom Inventory K

2. Neuroimaging per provider judgment L

3. Neuropsychological assessment by a psychologist
   - Evaluate: attention, memory, processing speed and executive function
   - Perform a psychosocial and behavioral assessment
   - Include measure of effort
   - Consider post-injury NCAT or other neurocognitive test

4. Functional assessment M completed by an occupational or physical therapist

5. Balance assessment completed by a qualified provider
   - BESS – Modified N
   - Other balance tests as appropriate (i.e. computerized tests, etc.)

6. Neurologist or other similarly qualified provider determines RTD status
Concussion Management in the Garrison Setting
(time of injury to 7 days)

**K** Neurobehavioral Symptom Inventory:
Available at www.DVBIC.org

**L** Neuroimaging per Provider Judgment:
Imaging after Mild TBI Clinical Recommendation found at www.DVBIC.org

**M** Functional Assessment:
Assess the Soldier’s performance of military-relevant activities that simulate the multi-system demands of duty in a functional context. Selected assessment activities should concurrently challenge specific vulnerabilities associated with concussion including cognitive (such as executive function), sensorimotor (such as balance and gaze stability), and physical endurance. Rehabilitation providers should not only evaluate the Soldier’s performance but also monitor symptoms before, during, and after functional assessment.

**N** The Balance Error Scoring System (BESS - Modified):**

Stand on flat surface, eyes closed, hands on hips in 3 positions:
1. On both feet (20 seconds)
2. On one foot (20 seconds)
3. Heel-to-toe stance (20 seconds)

For each position, score 1 point for any of the following errors:
1. Stepping, stumbling or falling
2. Opening eyes
3. Hands lifted above the iliac crests
4. Forefoot or heel lifted
5. Hip moved > 30 degrees flexion or abduction
6. Out of test position > 5 seconds

Score 10 points if unable to complete. Total Balance Score___________________

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  — Having one’s “bell rung,” being dazed/confused, or “seeing stars”
• Loss of Consciousness (LOC) 0-30 minutes
  — Temporarily blacked out
• Post-Traumatic Amnesia (PTA) ≤ 24 hours
  — Memory loss

Key Algorithm Directives:

• These algorithms guide concussion treatment in the garrison setting from point of injury up to 7 days
• Event-driven protocols for exposure to potentially concussive events
  — Requires a medical evaluation and entry into the EMR
• All sports and activities with risk of concussion are prohibited until after a 24-hour recovery period
• Soldiers diagnosed with concussion will be given the acute concussion educational brochure available at www.DVBIC.org
• Specific requirements for anyone sustaining ≥ 2 concussions within the past 12 months
• Document and code all medical encounters in the EMR; complete an e-Profile using standardized enterprise templates

Acronyms:

• AOC Alteration of consciousness
• BESS Balance Error Scoring System
• CPG Clinical practice guideline
• CT Computed tomography
• EMR Electronic medical record
• GCS Glasgow Coma Scale
• GWOT Global War on Terrorism
• ICD-9 International Classification of Diseases – 9th revision
• LOC Loss of consciousness
• MACE Military Acute Concussion Evaluation
• mTBI Mild traumatic brain injury
• NCAT NeuroCognitive Assessment Tool
• PCM Primary care management
• PTA Post-traumatic amnesia
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