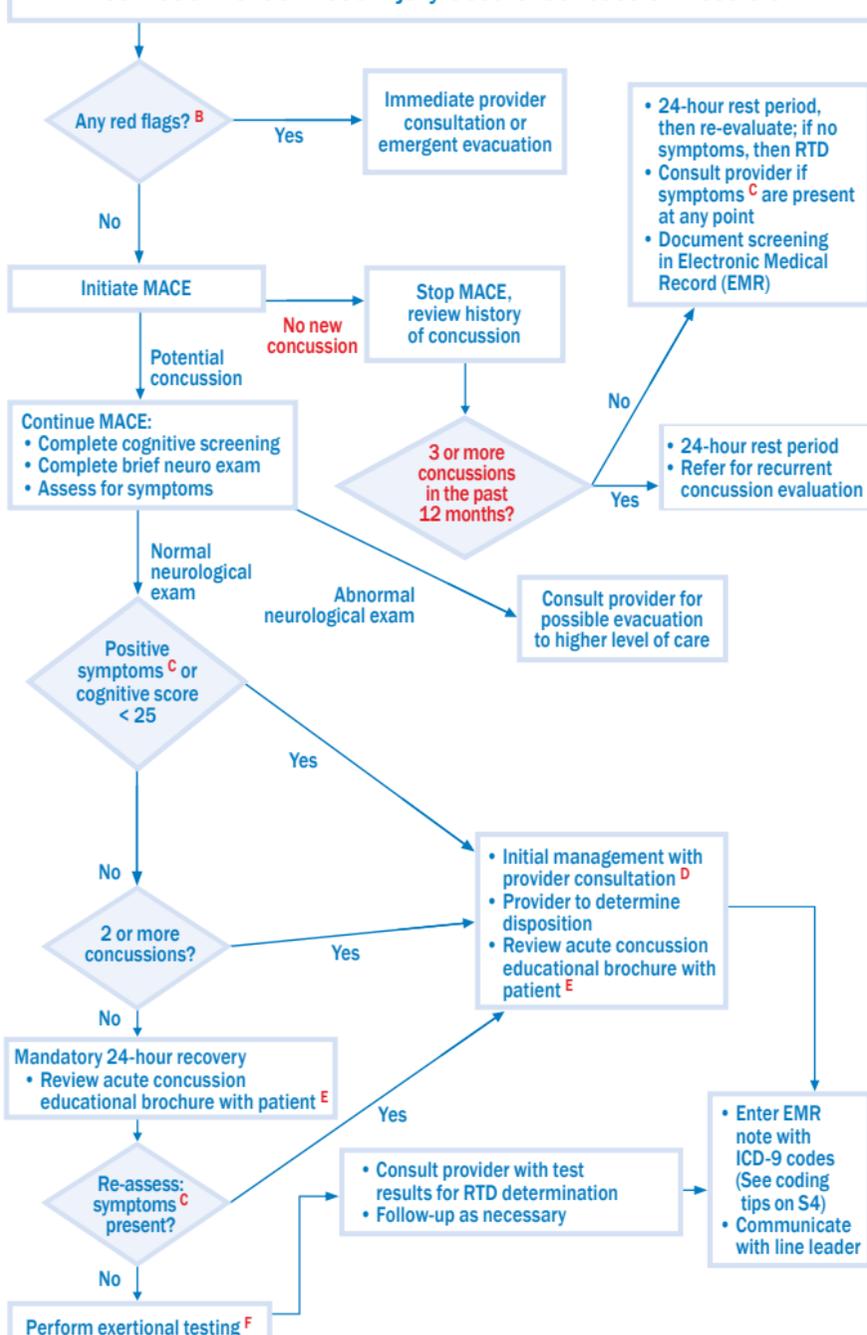


## 1 COMBAT MEDIC/CORPSMAN ALGORITHM

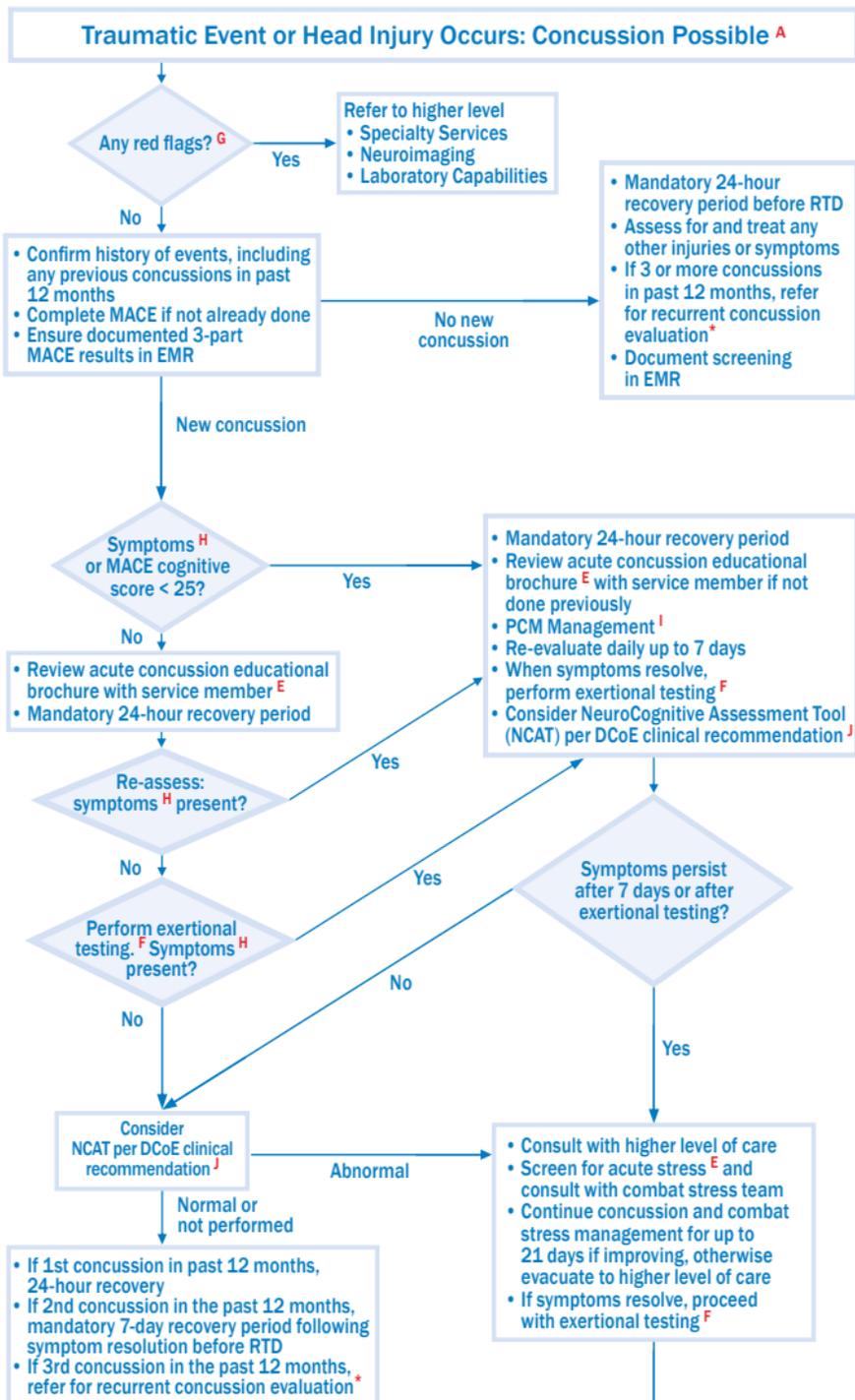
(Pre-hospital/no medical officer in the immediate area)



Priority: Quickly assess for red flags

## 2 INITIAL PROVIDER ALGORITHM

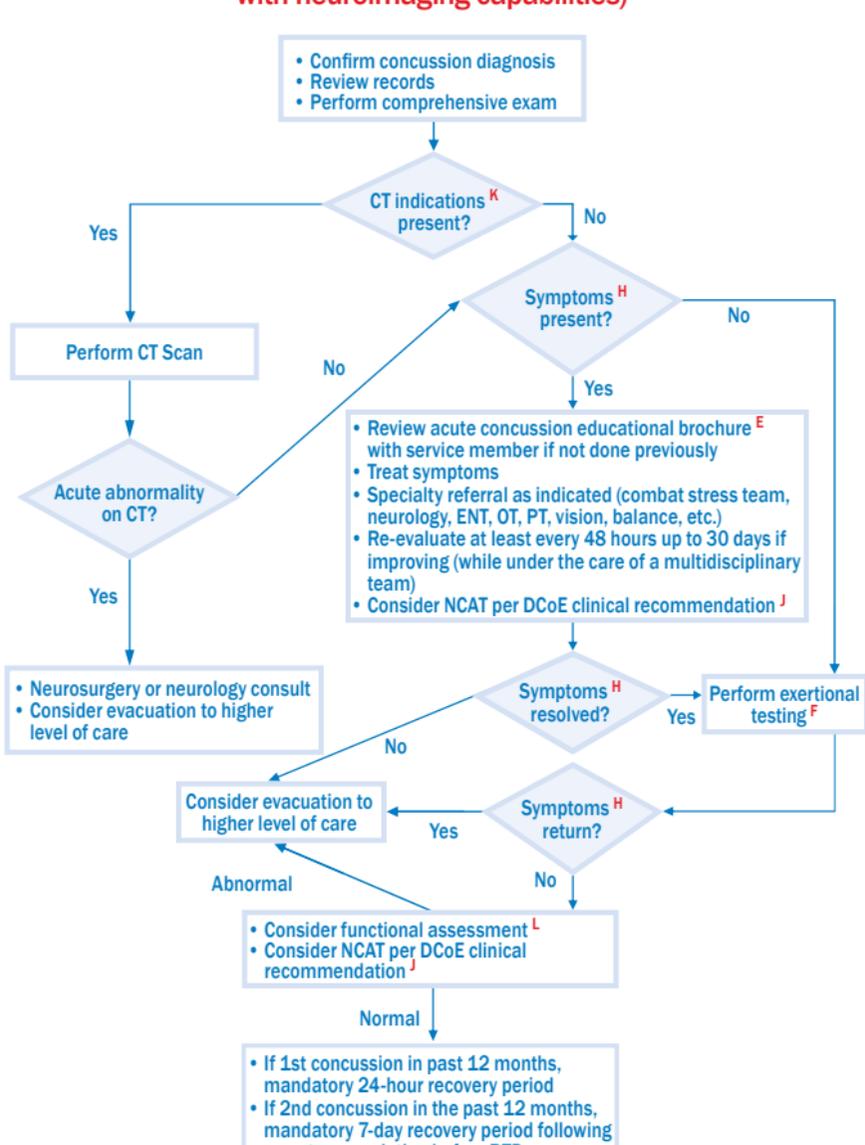
(Management of Concussion in Deployed Setting)



<sup>\*</sup> See Recurrent Concussion Evaluation

## 3 COMPREHENSIVE CONCUSSION ALGORITHM

(Referral to military treatment facility with neuroimaging capabilities)



<sup>\*</sup> See Recurrent Concussion Evaluation

## 4 RECURRENT CONCUSSION EVALUATION

(three or more documented in 12-month span)

- Comprehensive neurological evaluation by neurologist or otherwise 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 <sup>E</sup>
      - Acute Stress Reaction questionnaire <sup>E</sup>
    - Balance assessment <sup>M</sup>
- Neuroimaging per provider judgement
- Neuropsychological assessment by psychologist
  - Evaluate: attention, memory, processing speed and executive function
  - Perform a psychosocial and behavioral assessment
  - Include measure of effort
  - Consider NCAT per DCoE clinical recommendation <sup>J</sup>
- Functional assessment <sup>L</sup> completed by occupational therapy/physical therapy
- Neurologist (or qualified provider) determines RTD status



## S1

### Traumatic Event or Head Injury Occurs: Concussion Possible

#### A Mandatory Events Requiring Concussion Evaluation:

1. Any service member in a vehicle associated with a blast event, collision or rollover
2. Any service member within 50 meters of a blast (inside or outside)
3. Anyone who sustains a direct blow to the head
4. Command directed — such as, but not limited to, repeated exposures

#### B Medic/Corpsman Algorithm Red Flags:

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

#### C Medic/Corpsman Algorithm Symptoms:

(Persisting beyond initial traumatic event)

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

#### D Medic/Corpsman Initial Management of Concussion:

- |  |  |
|--|--|
| 1. Give acute concussion educational brochure to all concussion patients, available at: <a href="http://dvbic.dcoe.mil">dvbic.dcoe.mil</a> | 4. Aggressive headache management<br>– Use acetaminophen q 6 hrs x 48 hrs<br>After 48 hours may use naproxen prn |
| 2. Reduce environmental stimuli  | 5. <b>Avoid tramadol, Fioricet, excessive triptans and narcotics</b>   |
| 3. Mandatory 24-hour recovery period   |  |

#### E Available Resources ([dvbic.dcoe.mil](http://dvbic.dcoe.mil)):

- |   |   |
|---|---|
| • Acute Stress Reaction Questionnaire   | • Line Leader Fact Sheet                                    |
| • Acute Concussion Educational Brochure | • Coding Guidance   |
| • Neurobehavioral Symptom Inventory     | • DCoE NeuroCognitive Assessment Tool (NCAT) Recommendation |

## S2

#### F Exertional Testing:

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

#### G Provider Algorithm Red Flags:

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

#### H Provider Algorithm Symptoms:

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

#### I Primary Care Management (PCM):

- |  |   |
|--|---|
| 1. Give acute concussion educational brochure to all concussion patients, available at: <a href="http://dvbic.dcoe.mil">dvbic.dcoe.mil</a> | 7. Implement duty restrictions  |
| 2. Reduce environmental stimuli  | 8. Review current medications and sleep hygiene (Healthy Sleep fact sheet available at <a href="http://dvbic.dcoe.mil">dvbic.dcoe.mil</a> ) and consider short-term low dose non-benzodiazepine hypnotic (e.g., zolpidem 5mg) |
| 3. Mandatory 24-hour recovery period   | 9. Pain management if applicable  |
| 4. Aggressive headache management<br>– Use acetaminophen q 6 hrs x 48 hrs<br>After 48 hours may use naproxen prn                           | 10. Send consult to <a href="mailto:med.consult.army@mail.mil">med.consult.army@mail.mil</a> for further guidance if needed   |
| 5. <b>Avoid tramadol, Fioricet, excessive triptans and narcotics</b>   | 11. Consider evacuation to higher level of care if clinically indicated   |
| 6. Consider nortriptyline q HS or amitriptyline q HS for persistent headache (> 7 days). Prescribe no more than 10 pills.                  | 12. Document concussion diagnosis in EMR  |

**[med.consult.army@mail.mil](mailto:med.consult.army@mail.mil) is a Department of Defense email consultation service provided by the Army OTSG Telemedicine Teleconsultation Programs to assist deployed clinicians with the treatment of TBI and RTD decisions.**

## S3

#### J DCoE NeuroCognitive Assessment Tool (NCAT) Recommendation:

Current DoD policy is that all service members must be tested with a neurocognitive assessment tool (NCAT) prior to deployment. Among several tests that are available, the DoD has selected the Automated Neuropsychological Assessment Metrics (ANAM) as the NCAT to use for both pre-deployment baseline testing and for post-concussion assessment in theater. Detailed instructions for administering a post-injury ANAM are provided at [dvbic.dcoe.mil](http://dvbic.dcoe.mil).

For ANAM baseline results send requests to:  
[usarmy.jbsa.medcom.mbx.otsg--anam-baselines@mail.mil](mailto:usarmy.jbsa.medcom.mbx.otsg--anam-baselines@mail.mil)

#### K CT Indications:\*

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

\* Haydel MJ, Preston CA, Mills TJ, Luber S, Blaudeau E, DeBlieux PM. Indications for computed tomography in patients with minor head injury. N Engl J Med. 2000 Jul 13;343(2):100-5.

#### L Functional Assessment:

Assess the service member'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 mTBI including cognitive (such as executive function), sensorimotor (such as balance and gaze stability), and physical endurance. Rehabilitation providers should not only evaluate the service member's performance but also monitor symptoms before, during and after functional assessment.

#### M 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      | 4. Forefoot or heel lifted                     |
| 2. Opening eyes                        | 5. Hip moved > 30 degrees flexion or abduction |
| 3. Hands lifted above the iliac crests | 6. Out of test position > 5 seconds            |

Score 10 points if unable to complete  
Total Balance Score \_\_\_\_\_

\*\* Guskiewicz KM, Ross SE, Marshall SW. Postural Stability and Neuropsychological Deficits After Concussion in Collegiate Athletes. J Athl Train. 2001 Sep;36(3):263-273.

## S4

#### Definition of Concussion:

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

- Any alteration in mental status (e.g., confusion, disorientation, slowed thinking, etc.).
- Any loss of memory for events immediately before or after the injury.
- Any period of loss of or a decreased level of consciousness, observed or self-reported.

#### Coding Tips:

- |   |  |
|---|--|
| 1. Primary code (corpsman/medics require co-sign)<br>• 850.0 - Concussion without LOC<br>• 850.11 - Concussion with LOC ≤ 30 min. | 3. Symptom codes<br>• As appropriate   |
| 2. Personal history of TBI in Global War on Terror (GWOT)<br>• V15.52_2 - Injury related to GWOT, mild TBI                        | 4. Deployment status code<br>• V70.5_5 - During deployment encounter   |
|   | 5. Screening code for TBI<br>• V80.01  |
|   | 6. External cause of injury code (E-code)<br>• E979.2 (if applicable) - Terrorism involving explosions and fragments |

#### Key Algorithm Directives:

- Personnel are required to use the algorithms to treat concussion in the deployed setting
- Mandatory event-driven protocols for exposure to potentially concussive events  
– Requires a medical evaluation and minimum 24-hour rest period
- All sports and activities with risk of concussion are prohibited until after a 24-hour rest period
- Military Acute Concussion Evaluation (MACE) documentation will address all 3 MACE parts
- Service members diagnosed with concussion will be given the acute concussion educational brochure available at: [dvbic.dcoe.mil](http://dvbic.dcoe.mil)
- Specific protocols for anyone sustaining ≥ 2 concussions within 12 months

#### MACE Documentation

Document using the mnemonic "CNS"

- (1) C – Cognitive score
- (2) N – Neurological exam reported as normal or abnormal
- (3) S – Symptoms reported as present or absent

If a head injury event or AOC/LOC/PTA is not reported, then a concussion has not occurred. The MACE is stopped because the cognitive portion is not valid in non-concussed patients. Evaluate and treat any other symptoms or injuries, and document the event in the EMR. The MACE score should be reported as N/A.

#### Repeat MACE Tips:

Repeating the MACE's Cognitive Exam with a different version (A-F) may be used to evaluate acute concussion recovery; however, a physical exam and symptom assessment must accompany any repeated cognitive exam. Providers should be mindful of other factors affecting the MACE cognitive score such as sleep deprivation, medications or pain.

For additional copies or information call 1.866.966.1020 or email [info@DVBIC.org](mailto:info@DVBIC.org)