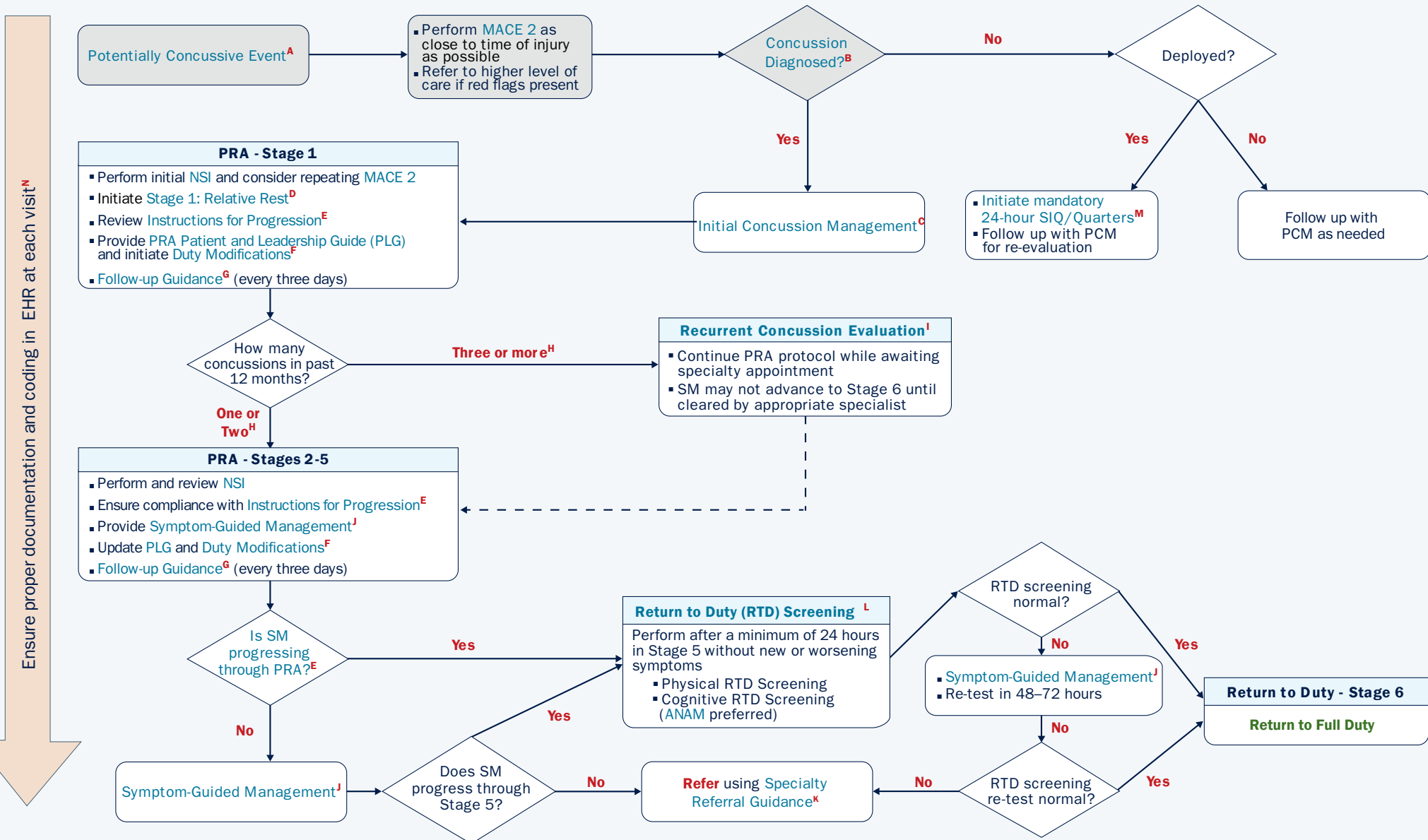


# Progressive Return to Activity: Primary Care for Acute Concussion Management

The algorithm below provides guidance on how to return a service member to full duty following a concussion. This is an interactive document. Please click the appropriate links in each box for detailed instructions and additional resources. To navigate back to this page use the 'Return to Algorithm' button at the bottom of each page.



- A. Potentially Concussive Event:** Per [DoDI 6490.11](#), events requiring mandatory rest periods and medical evaluations and reporting of exposure of all involved personnel include, but are not limited to:
- Involvement in a vehicle blast event, collision, or rollover
  - Presence within 50 meters of a blast (inside or outside)
  - A direct blow to the head or witnessed loss of consciousness
  - Exposure to more than one blast event (the service member’s commander shall direct a medical evaluation)

- B. Concussion Diagnosis:** [2015 DoD Definition of Traumatic Brain Injury](#): 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 of mental status (e.g. confusion, disorientation, slowed thinking, etc.)
  - Any period of loss of or a decreased level of consciousness, observed or self-reported
  - Any loss of memory for events immediately before or after the injury

TBI Severity			
Criteria	Mild/Concussion	Moderate	Severe
Structural imaging	A CT scan is not indicated for most patients with a concussion*	Normal or abnormal	Normal or abnormal
Loss of consciousness (LOC)	0–30 minutes	> 30 minutes and < 24 hours	> 24 hours
Alteration of consciousness (AOC)	up to 24 hours	> 24 hours. Severity based on other criteria	
Post-traumatic amnesia (PTA)	0–1 day	> 1 and < 7 days	> 7 days

\* If obtained, the CT scan is normal

- C. Initial Concussion Management:** May be performed by first responder/medic/corpsman, emergency department provider, or PCM
- Provide concussion education and set expectations for full recovery
    - [What You Should Know About Concussions](#)
    - [Healthy Sleep Following Concussion/mTBI](#)
  - Manage acute headache
    - Use acetaminophen every 6 hours for 48 hours followed by NSAIDs as needed
    - Delay use of NSAIDs for 48 hours after concussion
    - Avoid tramadol, acetaminophen/caffeine/butalbital, and opioids
    - Refer to [Headache Following mTBI Clinical Recommendation](#) for further guidance
  - Review current medications and supplements
  - Initiate 24-hour SIQ/Quarters
  - Follow up with PCM in 24 hours

**D. Relative Rest:** Physical and cognitive activities that do not provoke symptoms

- Light physical activities
- Simple, familiar cognitive tasks
- Quiet environment with limited stimulation
- Healthy sleep and nutrition

Note: Stage 1 of the PRA consists of full-time relative rest. In Stages 2–5, service members should continue to utilize these guidelines to rest between more strenuous activities or if they exhibit any new or worsening symptoms.

# DOD Clinical Recommendation | January 2023

## Progressive Return to Activity:

### Primary Care for Acute Concussion Management

#### E. Stages of the PRA: Instructions for Progression (Continued on next page)

Stage	Objective	Environment	Physical/Vestibular Activity	Cognitive/Oculomotor Activity	Restrictions Stages 1-5
<b>Stage 1*: Relative Rest</b>	Avoid symptom provocation, and rest to promote recovery	<ul style="list-style-type: none"> <li>Minimize light and noise</li> <li>Stay home/in quarters</li> </ul>	<ul style="list-style-type: none"> <li>Daily activities that do not provoke symptoms</li> <li>Limit large or sudden changes in head position</li> <li>No exercise</li> </ul>	<ul style="list-style-type: none"> <li>Limit screen time as needed to avoid symptom provocation</li> <li>Very light leisure activity (e.g. reading, television, conversation)</li> </ul>	<ul style="list-style-type: none"> <li>Do not go outside the wire in a combat zone</li> </ul>
<b>Stage 2: Symptom-Limited Activity</b>	Introduce and promote mild exertion	<ul style="list-style-type: none"> <li>Calm and familiar environment with limited distractions</li> </ul>	<ul style="list-style-type: none"> <li>Limit large or sudden changes in head position</li> <li>Light routine exertion (e.g. walking on even terrain, light household chores, stationary bike)</li> <li>No weight or resistance training</li> </ul>	<ul style="list-style-type: none"> <li>Simple, familiar activities performed one at-a-time (e.g. routine computer use, leisure reading)</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or reduce pre-injury levels of caffeine/energy drinks and nicotine</li> </ul>
<b>Stage 3: Light Activity</b>	Introduce occupation-specific exertion and environmental distractions	<ul style="list-style-type: none"> <li>Introduce environmental distractions during activity</li> <li>Return to work on limited duty/profile without significant symptom provocation</li> </ul>	<ul style="list-style-type: none"> <li>Initiate tasks requiring changes in head position</li> <li>Light aerobic exercise without resistance (e.g. elliptical, stationary bike, walking on uneven terrain)</li> <li>No lifting &gt; 20 pounds</li> <li>No resistance training</li> </ul>	<ul style="list-style-type: none"> <li>Simple, unfamiliar tasks or complex familiar tasks (e.g. grocery shopping, technical reading)</li> </ul>	<ul style="list-style-type: none"> <li>No alcohol**</li> <li>No combatives or contact sports***</li> </ul>
<b>Stage 4: Moderate Activity</b>	Increase activity intensity and duration	<ul style="list-style-type: none"> <li>Distracting or busy environment during activity as tolerated</li> </ul>	<ul style="list-style-type: none"> <li>Attempt tasks requiring more significant or sudden changes in head position</li> <li>Increase intensity and duration of activities (e.g. non-contact sports, hiking or running, push-ups, sit-ups)</li> <li>Introduce resistance training as tolerated</li> </ul>	<ul style="list-style-type: none"> <li>Increase intensity and duration of activities (e.g. navigate busy environments, recall and follow complex instructions)</li> </ul>	<ul style="list-style-type: none"> <li>No driving until visual and vestibular symptoms have resolved</li> </ul>
<b>Stage 5***: Intensive Activity</b>	Introduce exertion of duration and intensity that parallels service member's typical role <ul style="list-style-type: none"> <li>Complete <a href="#">RTD Screening</a> prior to advancement to Stage 6</li> </ul>	<ul style="list-style-type: none"> <li>Typical daily environment EXCEPT listed restrictions</li> </ul>	<ul style="list-style-type: none"> <li>Resume pre-injury exercise routine and training activities</li> </ul>	<ul style="list-style-type: none"> <li>Complex problem solving or multi-tasking with exertion or distracting environment</li> </ul>	<ul style="list-style-type: none"> <li>No weapons fire or blast exposure***</li> </ul>
<b>Stage 6: Return to Full Duty</b>	Return to pre-injury activities	<ul style="list-style-type: none"> <li>Typical daily environment</li> </ul>	<ul style="list-style-type: none"> <li>Unrestricted activity</li> </ul>		

\* Ensure SM adheres to Relative Rest guidelines and attempts to increase activity within 72 hours to avoid potentially detrimental effects of prolonged rest

\*\* Alcohol use can exacerbate post-concussive symptoms of headache, depression, and anxiety and can cause impaired cognitive functioning, dehydration, and sleep disturbances

\*\*\* In Stage 5 the SM may gradually increase exposure to high risk activities in a *supervised* training environment based on mission requirements

#### E. Instructions for Progression:

- Review [Stages of the PRA](#)
- SM must spend at least 24 hours in each stage
- At the beginning of each day the SM should self-evaluate their symptoms
  - If symptoms are the **same as or better** than the previous day AND there are no **new** symptoms, advance to the next stage
  - If symptoms are **worse** OR there are **new symptoms**, remain in current stage for an additional 24 hours
  - For patients that are not improving or worsening, reference [Follow-up Guidance, Symptom-Guided Management, or Specialty Referral Guidance](#)
- If symptoms worsen during an activity, the SM should follow the guidelines for [Relative Rest](#) until the exacerbation resolves, and then return to the previously tolerated stage for the remainder of the day
- After 24 hours in Stage 5 without new or worsening symptoms, the SM should follow up with PCM for [Return to Duty Screening](#)

#### F. Duty Modifications:

- The [Patient and Leadership Guide \(PLG\)](#) provides answers to common questions that command leadership may have regarding the PRA process and duty modifications. In addition, it outlines activities that the SM should and should not perform for each stage of the PRA.
- Ensure that the PLG is given to every SM with a concussion and communicated with their chain of command.
- Policies and procedures are service and command specific. Consult duty and deployment standards for your organization when dispositioning patient.
- Specific restrictions based on the patient's MOS/NEC/AFSC, individual injury characteristics, or any other factors should be annotated on the chit/profile as well as any reasons for lack of adherence to uniform standards.

#### G. Follow-up Guidance:

- Schedule follow-up appointments every 3 days or sooner if symptoms acutely worsen
  - Consider virtual, telephone, or clinical support staff follow-ups if feasible in your practice setting
- If service member does not advance through a single stage for 3 consecutive days, upon follow-up:
  - Ensure compliance with activity recommendations
  - Refer to [Symptom-Guided Management](#)
- If symptoms persist > 15 days, consult [Specialty Referral Guidance](#)

#### H. Multiple Concussion Guidance: Required for deployed SMs per DoDI 6490.11, and recommended for SMs in garrison

- **Two concussions in the last 12 months:**
  - SM must spend a minimum of 7 days in the PRA protocol prior to RTD Screening
- **Three or more concussions in the last 12 months:**
  - Refer for [Recurrent Concussion Evaluation](#)
  - Continue PRA protocol while awaiting specialty appointment
  - SM can only be returned to full duty (Stage 6) by a specialist
- For imaging recommendations refer to the [Neuroimaging Following Mild TBI Clinical Recommendation](#)

#### I. Recurrent Concussion Evaluation: Required for SMs who have sustained 3 or more concussions in a 12-month span

#### J. Symptom-Guided Management:

- The following table provides recommendations and resources for how to treat the most common symptoms associated with concussion.

Symptom Cluster	Signs and Symptoms	Evaluation	Primary Care Management
<b>Anxiety/ Mood</b>	<ul style="list-style-type: none"> <li>Depression/feeling sad</li> <li>Irritability</li> <li>Low tolerance to frustration</li> <li>Mood changes/lability</li> <li>Nightmares</li> </ul>	<ul style="list-style-type: none"> <li>GAD-7 <math>\geq 10</math></li> <li>NSI questions 17-22</li> <li>PHQ-9 <math>\geq 10</math></li> </ul>	<ul style="list-style-type: none"> <li>Refer immediately to Behavioral Health for any concerns about harm to self or others</li> <li>Consider acute intervention in cases of acute stress reaction: education, reassurance of safety, normalization, acute symptom management, social support</li> <li>Non-pharmacologic: mindfulness, deep breathing and relaxation, pleasurable activities, exercise (if appropriate)</li> <li><a href="#">Depression Resources</a></li> <li><a href="#">Primary Care Behavioral Health Clinical Pathways</a></li> <li><a href="#">VA/DoD PTSD and ASD CPG</a></li> </ul>
<b>Cervical</b>	<ul style="list-style-type: none"> <li>Dizziness (cervicogenic)</li> <li>Headache</li> <li>Neck pain</li> <li>Numbness</li> </ul>	<ul style="list-style-type: none"> <li>Physical exam</li> </ul>	<ul style="list-style-type: none"> <li>Non-pharmacologic: Traditional Chinese or Medical Acupuncture</li> <li>Pharmacologic: acetaminophen every 6 hours for up to 48 hours post-concussion followed by NSAIDs as needed; avoid tramadol, acetaminophen/caffeine/butalbital, and opioids</li> <li><a href="#">Dizziness and Visual Disturbances Following mTBI Clinical Recommendation</a></li> <li><a href="#">Headache Following mTBI Clinical Recommendation</a></li> </ul>
<b>Cognitive</b>	<ul style="list-style-type: none"> <li>Confusion/foggy thinking</li> <li>Delayed response</li> <li>Difficult concentrating</li> <li>Difficult with memory/forgetfulness</li> </ul>	<ul style="list-style-type: none"> <li>MACE 2 cognitive score <math>\leq 25</math></li> <li>NSI questions 13-16</li> </ul>	<ul style="list-style-type: none"> <li>If there are any concerns about cognition, confirm patient report of symptoms and performance with third party when possible</li> <li>Physical and sleep-related symptoms may impact cognitive function- identify and treat contributing conditions</li> <li><a href="#">Cognitive Rehabilitation Following mTBI Clinical Recommendation</a></li> </ul>
<b>Headache</b>	<ul style="list-style-type: none"> <li>Auras</li> <li>Neck pain</li> <li>Numbness, tingling, weakness</li> <li>Phonosensitivity</li> <li>Photosensitivity</li> </ul>	<ul style="list-style-type: none"> <li>HIT-6 <math>\geq 50</math></li> <li>NSI questions 4-7, 9, 11</li> </ul>	<ul style="list-style-type: none"> <li>Non-pharmacologic: Traditional Chinese or Medical Acupuncture</li> <li>Pharmacologic: acetaminophen every 6 hours for up to 48 hours post-concussion followed by NSAIDs as needed; avoid tramadol, acetaminophen/caffeine/butalbital, and opioids</li> <li><a href="#">Headache Following mTBI Clinical Recommendation</a></li> </ul>
<b>Oculomotor</b>	<ul style="list-style-type: none"> <li>Blurry vision</li> <li>Decreased attention for visual tasks</li> <li>Difficult reading (paper or screen)</li> <li>Double vision</li> <li>Eye strain</li> <li>Headache</li> <li>Photosensitivity</li> </ul>	<ul style="list-style-type: none"> <li>NSI questions 4, 6, 7</li> <li>VOMS Abnormal Smooth Pursuits, Saccades, or Convergence testing</li> </ul>	<ul style="list-style-type: none"> <li>Oculomotor symptoms often spontaneously resolve within a few weeks after injury</li> <li><a href="#">Dizziness and Visual Disturbances Following mTBI Clinical Recommendation</a></li> <li><a href="#">VOMS Visual Guide</a></li> </ul>
<b>Sleep</b>	<ul style="list-style-type: none"> <li>Difficult falling/staying asleep</li> <li>Excessive daytime sleepiness</li> <li>Fatigue</li> <li>Nightmares</li> <li>Sleeping too much or too little</li> </ul>	<ul style="list-style-type: none"> <li>ESS &gt; 10</li> <li>ISI &gt; 11</li> <li>NSI questions 17, 18</li> </ul>	<ul style="list-style-type: none"> <li>Sleep disruption can exacerbate other symptom clusters and may prolong recovery</li> <li><a href="#">Sleep Disturbances Following mTBI Clinical Recommendation</a></li> </ul>
<b>Vestibular</b>	<ul style="list-style-type: none"> <li>Decreased coordination</li> <li>Dizziness/vertigo</li> <li>Loss of balance</li> <li>Motion sensitivity</li> <li>Nausea</li> <li>Nystagmus</li> </ul>	<ul style="list-style-type: none"> <li>NSI questions 1-3, 8</li> <li>VOMS Abnormal Vestibular/Ocular Reflex or Visual Motion Sensitivity testing</li> </ul>	<ul style="list-style-type: none"> <li>If appropriate, evaluate and treat benign paroxysmal positional vertigo</li> <li><a href="#">Dizziness and Visual Disturbances Following mTBI Clinical Recommendation</a></li> <li><a href="#">VOMS Visual Guide</a></li> </ul>

#### K. Specialty Referral Guidance:

- Patients who do not respond to initial management and have symptoms persisting >15 days may benefit from referral to TBI specialty clinic, if available, or specialties listed below.

Symptom Cluster	Specialty Referral
<b>Anxiety/ Mood</b>	<b>Behavioral Health</b> <ul style="list-style-type: none"> <li>Consider early referral in cases of acute stress reaction that do not rapidly resolve with simple measures</li> <li>Evaluation of new or premorbid behavioral health conditions</li> </ul>
<b>Cervical</b>	<b>Physical Medicine and Rehabilitation (PM&amp;R)</b> <ul style="list-style-type: none"> <li>Assessment of persistent neck pain with comorbid chronic pain or persistent headache secondary to musculoskeletal dysfunction</li> </ul> <b>Physical Therapy</b> <ul style="list-style-type: none"> <li>Assessment and treatment of persistent neck pain following mTBI</li> </ul>
<b>Cognitive</b>	<b>Neuropsychology</b> <ul style="list-style-type: none"> <li>Formal evaluation to determine a need for work/home/school accommodations</li> </ul> <b>Occupational Therapy</b> <ul style="list-style-type: none"> <li>Strategies for daily living, functional cognition interventions, adaptive equipment/technology, driving evaluations</li> </ul> <b>Speech Language Pathology</b> <ul style="list-style-type: none"> <li>Cognitive rehabilitation strategies, speech disfluencies, organizational strategies</li> </ul>
<b>Headache</b>	<b>Neurology</b> <ul style="list-style-type: none"> <li>Assessment of persistent headaches when: (a) the diagnosis is not clear, (b) headaches do not respond to traditional treatment or prevention strategies, (c) there is a significant unresolved disability due to headache, (d) prolonged or persistent aura, or (e) headaches with accompanied motor weakness</li> </ul> <b>Neuro-Optometry</b> <ul style="list-style-type: none"> <li>Evaluation of headaches secondary to visual changes or eye strain</li> </ul> <b>Physical Medicine and Rehabilitation (PM&amp;R)</b> <ul style="list-style-type: none"> <li>Assessment of persistent headaches with comorbid chronic pain or persistent headache secondary to musculoskeletal dysfunction</li> </ul>
<b>Oculomotor</b>	<b>Neuro-Optometry</b> <ul style="list-style-type: none"> <li>Assessment of visual disturbances that started or worsened after mTBI</li> </ul> <b>Occupational Therapy</b> <ul style="list-style-type: none"> <li>Strategies for daily living, functional vision interventions, adaptive equipment/technology, driving evaluations</li> </ul>
<b>Sleep</b>	<b>Behavioral Health</b> <ul style="list-style-type: none"> <li>Evaluation of behavioral health conditions that may impact sleep</li> </ul> <b>Sleep Medicine</b> <ul style="list-style-type: none"> <li>Evaluation of persistent or chronic sleep disturbance</li> </ul>
<b>Vestibular</b>	<b>Vestibular Therapy</b> <ul style="list-style-type: none"> <li>Specialized physical or occupational therapy to alleviate dizziness and other problems associated with vestibular disorders</li> </ul>

#### L. Return To Duty (RTD) Screening:

- Before returning to full duty, SM should pass the Physical AND Cognitive RTD Screenings to ensure mission readiness.
- These tests should be performed after the service member has spent a minimum of 24 hours in Stage 5 without new or worsening symptoms.
- The purpose of the RTD screening is to give the provider a way to objectively measure readiness for return to duty. This may be used in conjunction with patient's subjective history of tolerated physical and cognitive activities.
- Consider MOS/NEC/AFSC service specific return to duty requirements (e.g. flight status, dive status, jump status, etc.) prior to RTD.

#### Physical RTD Screening:

- Physical exertion testing may be done in office, gym, or PT area.
- Have the service member perform 2 minutes of supervised aerobic activities at an exertion rate of 16 or greater on [Borg RPE \(Appendix C\)](#).
  - Preferred activities include modified burpees, sit-ups, or jumping jacks, as these activities will stress the vestibular system. Other activities may include high-knees, step-ups, push-ups, running, elliptical, or exercise bike.
  - Consider simulating combat environment if in a deployed setting.
  - Consider integrating MOS/NEC/AFSC specific-tasks and duty requirements.
- During exertion, observe service member for overt symptom provocation. If symptoms worsen, stop the test:
  - Remain in Stage 5 and re-test in 48–72 hours as appropriate.
  - Refer to [Symptom-Guided Management](#) while awaiting re-test.
- If the re-test is abnormal, refer to higher level of care based on [Specialty Referral Guidance](#).
- If the Physical RTD Screening is normal, proceed to the Cognitive RTD Screening.

#### Cognitive RTD Screening:

- The preferred neurocognitive screening is the Automated Neuropsychological Assessment Metrics (ANAM). If ANAM is unavailable, repeat the Cognitive Exam portion of the MACE 2 (Questions 5–16).
- See [ANAM Guidance \(Appendix D\)](#) for further information.

**M. Mandatory 24-hour SIQ/Quarters:** Per [DoDI 6490.11](#), service members involved in a potentially concussive event during deployment are required to rest for 24 hours, beginning at the time of the event. In certain circumstances, these recommendations can be superseded based on commanders' determination of mission requirements.

**N. TBI Coding Guidance:** Refer to TBICoE online resource for specific coding instruction.

ACRONYMS			
<b>AFSC</b>	Air Force Specialty Code	<b>ANAM</b>	Automated Neuropsychological Assessment Metrics
<b>ASD</b>	Acute Stress Disorder	<b>CNS</b>	Central Nervous System
<b>CPG</b>	Clinical Practice Guideline	<b>CT</b>	Computed Tomography
<b>DoD</b>	Department of Defense	<b>DoDI</b>	Department of Defense Instruction
<b>EHR</b>	Electronic Health Record	<b>GAD-7</b>	General Anxiety Disorder-7
<b>HIT-6</b>	Headache Impact Test-6	<b>MACE 2</b>	Military Acute Concussion Evaluation 2
<b>MOS</b>	Military Occupational Specialty	<b>NEC</b>	Navy Enlisted Classification
<b>NSAIDs</b>	Nonsteroidal Anti-Inflammatory Drugs	<b>NSI</b>	Neurobehavioral Symptom Inventory
<b>PCM</b>	Primary Care Manager	<b>PHQ-9</b>	Patient Health Questionnaire-9
<b>PRA</b>	Progressive Return to Activity	<b>PTSD</b>	Post-Traumatic Stress Disorder
<b>RTD</b>	Return to Duty	<b>SIQ</b>	Sick in Quarters
<b>SM</b>	Service Member	<b>TBICoE</b>	Traumatic Brain Injury Center of Excellence
<b>VA</b>	Veterans Affairs	<b>VOMS</b>	Vestibular Oculomotor Screening

References/Acknowledgements: [Please click here for a full list of references and acknowledgments.](#)

## Appendix A: Neurobehavioral Symptom Inventory (NSI)

<b>Neurobehavioral Symptom Inventory (NSI)</b>					
<b>Instructions:</b> Please rate the following symptoms with regard to how much they have disturbed you <b>SINCE YOUR INJURY</b> .					
<b>0 = None:</b> Rarely if ever present; not a problem at all.					
<b>1 = Mild:</b> Occasionally present, but it does not disrupt my activities; I can usually continue what I'm doing; doesn't really concern me.					
<b>2 = Moderate:</b> Often present, occasionally disrupts my activities; I can usually continue what I'm doing with some effort; I feel somewhat concerned.					
<b>3 = Severe:</b> Frequently present and disrupts activities; I can only do things that are fairly simple or take little effort; I feel I need help.					
<b>4 = Very Severe:</b> Almost always present and I have been unable to perform at work, school or home due to this.					
<b>Symptom</b>	<b>0-None</b>	<b>1-Mild</b>	<b>2-Moderate</b>	<b>3-Severe</b>	<b>4-Very Severe</b>
1. Feeling dizzy	0	1	2	3	4
2. Loss of balance	0	1	2	3	4
3. Poor Coordination, clumsy	0	1	2	3	4
4. Headaches	0	1	2	3	4
5. Nausea	0	1	2	3	4
6. Vision problems, blurring, trouble seeing	0	1	2	3	4
7. Sensitivity to light	0	1	2	3	4
8. Hearing difficulty	0	1	2	3	4
9. Sensitivity to noise	0	1	2	3	4
10. Numbness or tingling on parts of my body	0	1	2	3	4
11. Change in taste and/or smell	0	1	2	3	4
12. Loss of appetite or increased appetite	0	1	2	3	4
13. Poor concentration, can't pay attention, easily distracted	0	1	2	3	4
14. Forgetfulness, can't remember things	0	1	2	3	4
15. Difficulty making decisions	0	1	2	3	4
16. Slowed thinking, difficulty getting organized, can't finish things	0	1	2	3	4
17. Fatigue, loss of energy, getting tired easily	0	1	2	3	4
18. Difficulty falling or staying asleep	0	1	2	3	4
19. Feeling anxious or tense	0	1	2	3	4
20. Feeling depressed or sad	0	1	2	3	4
21. Irritability, easily annoyed	0	1	2	3	4
22. Poor frustration tolerance, feeling easily overwhelmed by things	0	1	2	3	4
<b>The purpose of this inventory is to track symptoms over time. Please do not attempt to score.</b>					

Cicerone, K. D., & Kalmar, K. (1995). Persistent postconcussion syndrome: The structure of subjective complaints after mild traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 10, 1–17. <https://dx.doi.org/10.1097/00001199-199510030-00002>



## Appendix B: Patient and Leadership Guide (PLG)

### Progressive Return to Activity Following Concussion/mTBI Patient and Leadership Guide (PLG)

FROM: \_\_\_\_\_ TO: \_\_\_\_\_ DATE: \_\_\_\_\_

RANK/NAME/UNIT: \_\_\_\_\_ DoD ID#: \_\_\_\_\_

DIAGNOSIS: Concussion/mTBI Signature: \_\_\_\_\_

#### DUTY STATUS:

Quarters:  24 hours  48 hours  72 hours  N/A

Light Duty/Profile (per stages chart) for \_\_\_\_ days

Follow-up Dates/Times: \_\_\_\_\_

NOTES: \_\_\_\_\_

#### Follow-up:

The above service member (SM) has been diagnosed with a concussion, or mild traumatic brain injury (mTBI), and will be following the TBI CoE Progressive Return to Activity (PRA) Protocol throughout recovery. This process is unique in that the SM will progress at their own pace through the protocol but will have a **scheduled follow-up** with their provider **every three days**. Here are a few common questions related to concussions and this process:

#### What is the PRA?

The PRA is a six-step return to activity protocol. The earliest a SM can be returned to full duty after concussion is seven days. Following a gradual return to duty protocol has been shown to get SMs back to full duty safely and reduce long-term complications.

#### What could happen if a SM returns to duty too soon?

Returning a SM too soon places the SM and their unit at risk. Concussion can cause temporary disruption of mental and physical functioning, impairing reaction time, balance, marksmanship, etc. The SM should return to their primary care manager (PCM) and undergo a Return to Duty Screening before they may be returned to full duty.

#### What are common concussion symptoms?

Thinking/Remembering	Physical		Emotional/Mood	Sleep
Difficult concentrating	Balance problems	Dizziness	Irritability	Excessive daytime sleepiness
Difficult remembering new information	Feeling tired, having no energy	Fuzzy or blurry vision, difficult reading	More emotional	Sleeping less than usual
Difficult thinking clearly	Headache	Nausea or vomiting (early on)	Nervousness or anxiety	Sleeping more than usual
Feeling slowed down	Sensitivity to noise or light		Sadness	Trouble falling or staying asleep

#### What is the average recovery time from concussion/mTBI? When can the SM go back to work?

Most SMs fully recover from concussion. Recovery is different for each person, but most people are back to full duty in 2–4 weeks and will be treated solely by their PCM. However, some SMs may experience more severe symptoms that take longer to resolve and require a referral to a TBI Clinic or specialist.

#### How does a SM progress through the stages of the PRA?

The SM must spend at least 24 hours in each stage. At the beginning of each day the SM should evaluate how they feel:

- If symptoms are the same or better compared with the previous day **AND** they have no *new* symptoms—they can move **on to the next stage**
- If symptoms are worse compared with the previous day **OR** they have *new* symptoms—they remain at the current stage **for an additional 24 hours**

#### What does a SM do if there are new or worsening symptoms during the day?

Stop the activity until symptoms resolve. Then, return to the previously tolerated stage for the remainder of the day. The next day, reevaluate symptoms and continue progression through the PRA. Contact the provider with any questions or concerns.

## Appendix B: Patient and Leadership Guide (PLG)

Stages of Progressive Return to Activity				
Stage	Things Service Member <i>Should Do</i>		Things Service Member <i>Should Not Do</i>	
<b>Stage 1 – Relative Rest</b>	<ul style="list-style-type: none"> <li>Light physical activities that don't make symptoms worse (e.g. walking at easy pace)</li> <li>Light leisure activities that don't make symptoms worse (e.g. TV, reading)</li> </ul>	<ul style="list-style-type: none"> <li>Communicate with friends and family members for support</li> <li>Eat a healthy diet and drink plenty of water</li> <li>Get plenty of sleep, and take naps as needed in the early stages</li> <li>Maintain or reduce use of caffeine, energy drinks, and nicotine</li> <li>Take breaks if needed</li> </ul>	<ul style="list-style-type: none"> <li>Do not go to work (SIQ/Quarters)</li> <li>No physical training or exercise</li> </ul>	<ul style="list-style-type: none"> <li>Do not go outside the wire in a combat zone</li> <li>No alcohol</li> <li>No combatives or contact sports</li> <li>No driving until dizziness or visual symptoms have resolved</li> <li>No weapons fire or blast exposure</li> </ul>
<b>Stage 2 – Symptom-Limited Activity</b>	<ul style="list-style-type: none"> <li>Increase your physical activity (e.g. take a walk, ride a stationary bike without resistance, do light household activities)</li> <li>Light reading/computer work as tolerated</li> </ul>		<ul style="list-style-type: none"> <li>Avoid crowded areas</li> <li>Avoid extreme temperatures</li> <li>No group physical training</li> <li>No resistance/weight training</li> </ul>	
<b>Stage 3 – Light Activity</b>	<ul style="list-style-type: none"> <li>Increase physical activities (e.g. elliptical or stationary bike without resistance, walk further, lift or carry light loads of less than 20 pounds)</li> <li>More technical reading and computer work, go out in more crowded areas (e.g. grocery shopping)</li> <li>Start military specific tasks (e.g. clean equipment, perform maintenance checks, clean weapons)</li> </ul>		<ul style="list-style-type: none"> <li>No operating heavy machinery</li> <li>No resistance/weight training</li> <li>No riding in tactical vehicles</li> <li>No alternating shift work or shifts &gt; 8 hours</li> </ul>	
<b>Stage 4 – Moderate Activity</b>	<ul style="list-style-type: none"> <li>Increase physical activities (e.g. non-contact sports, hiking or running, resistance training as tolerated (e.g. push-ups, sit-ups), carry weight across uneven terrain)</li> <li>Increase complexity of military specific tasks (e.g. orienteering/land navigation, following complex instructions, begin wearing personal protective equipment as tolerated)</li> </ul>		<ul style="list-style-type: none"> <li>No operating heavy machinery</li> <li>No riding in tactical vehicles</li> <li>No alternating shift work or shifts &gt; 8 hours</li> </ul>	
<b>Stage 5 – Intensive Activity</b>	<ul style="list-style-type: none"> <li>Gradually increase exposure to high risk activities (e.g. combatives, weapons fire or blast exposure, contact sports) in a supervised training environment based on mission requirements</li> <li>Resume usual exercise routine and military tasks/training (e.g. use night vision goggles, take part in simulations, navigate uneven terrain/busy environment with flak jacket/Kevlar helmet/pack)</li> </ul>		<ul style="list-style-type: none"> <li>No alternating shift work or shifts &gt; 8 hours</li> </ul>	
<b>Stage 6 – Return to Full Duty</b>	<ul style="list-style-type: none"> <li>Unrestricted activity</li> </ul>			

## Appendix C: Borg Rate of Perceived Exertion (RPE) Scale

Instructions: The Borg Rate of Perceived Exertion (RPE) is a way of measuring physical activity intensity level. When conducting the Physical RTD Screening, have the service member begin the activity and ask them to rate their level of exertion using the Borg RPE. When they reach a 14–16, begin the two minute timer.

<b>6</b>	<b>No exertion at all</b>
<b>7–8</b>	<b>Extremely light</b>
<b>9</b>	<b>Very light</b> exercise. For a healthy person, it is like walking slowly at his or her own pace for some minutes
<b>10–12</b>	<b>Light</b>
<b>13</b>	<b>Somewhat hard</b> exercise, but it still feels OK to continue.
<b>14–16</b>	<b>Hard</b> (heavy)
<b>17–18</b>	<b>Very Hard.</b> A healthy person can still go on, but he or she really has to push him- or herself. It feels very heavy, and the person is very tired.
<b>19</b>	<b>Extremely strenuous</b> exercise level. For most people this is the most strenuous exercise they have ever experienced
<b>20</b>	<b>Maximal exertion</b>

Borg, G. (1982). Psychophysical bases of perceived exertion. *Medicine and Science in Sports and Exercise*, 14 (5), 377–81.

## Appendix D: ANAM Guidance

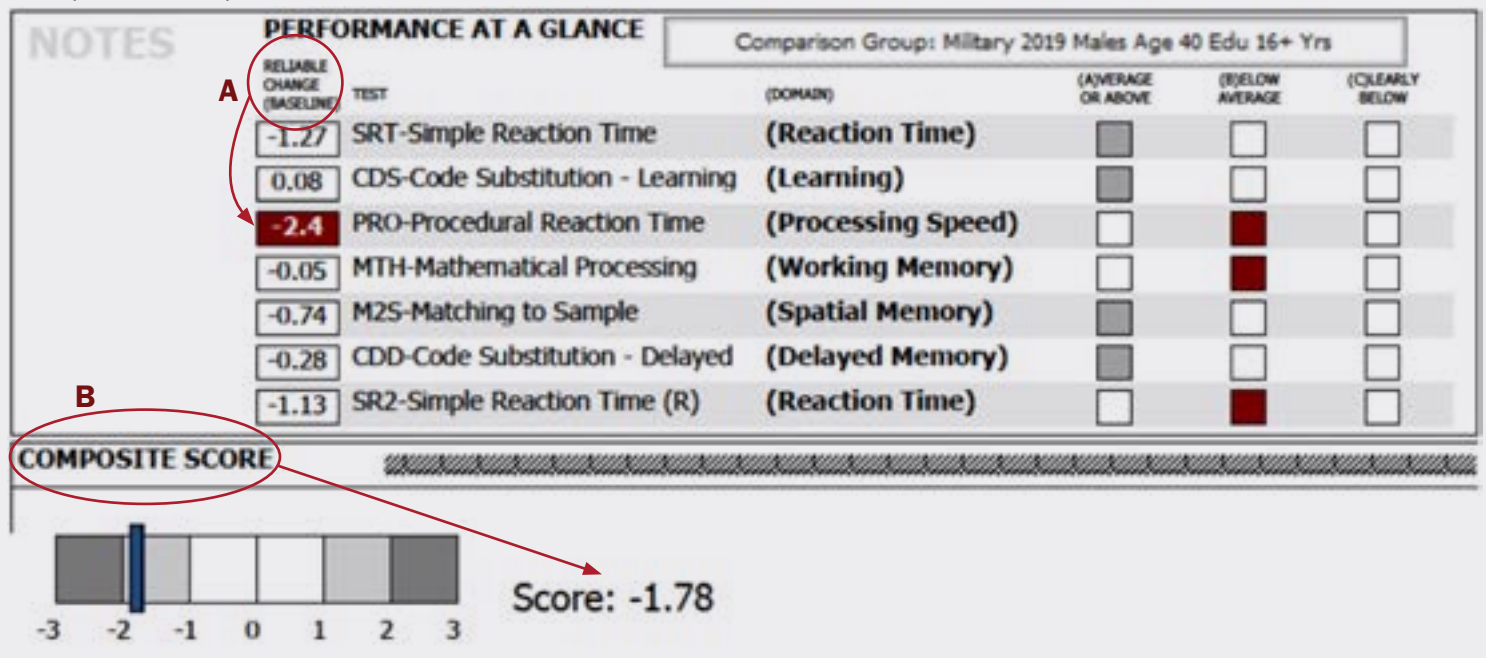
### How to Request ANAM

1. Call ANAM Help Desk
  - Phone number: 1-855-630-7849 (toll free)
  - Hours of Operation: 24 hours, 365 days
2. Send a request to ANAM Results Request Inbox (cannot be encrypted):  
[usarmy.jbsa.medcom.mbx.otsg-anam-baselines@health.mil](mailto:usarmy.jbsa.medcom.mbx.otsg-anam-baselines@health.mil)

### Interpretation of the ANAM Clinical Report

- A.** If service member **has a baseline ANAM**, refer to the Reliable Change scores for each subtest. If the Reliable Change is less than -1.64 on any one subtest (appearing in a red box), or less than -1.28 on 2 or more subtests, remain in Stage 5 and repeat ANAM in 48–72 hours.
- B.** If service member **does not have a baseline ANAM**, refer to the overall Composite Score. If the Composite Score is less than -1.64, remain in Stage 5 and repeat ANAM in 48–72 hours.

Example ANAM Report



- If service member does not meet criteria for return to duty after second attempt, refer to Neuropsychologist/ Speech Language Pathologist (SLP) for further evaluation.
- The ANAM Help Desk can answer general questions. For questions regarding ANAM interpretation, please consult a Neuropsychologist or specialist.

**If ANAM is unavailable**, repeat the Cognitive Exam portion of the [MACE 2](#) (Questions 5–16)

- SM should score > 25 to be considered ready to return to full duty.
- If SM scores ≤ 25, remain in Stage 5 and repeat in 48–72 hours.
- If the score continues to be ≤ 25, refer for ANAM (see above) or to Neuropsychologist/Speech Language Pathologist (SLP) for further evaluation.

## Appendix E: PRA Frequently Asked Questions (FAQs)

Responses to frequently asked questions are listed below to assist providers in implementation of the PRA.

### GENERAL:

**Question:** What is the PRA?

**Answer:** The PRA is a gradual, evidence-based protocol that facilitates return-to-duty in a six-stage process. The earliest a SM can progress through all six stages and be returned to full duty is 7 days after concussion.

**Question:** Why should I use a PRA protocol after concussion?

**Answer:** Following a step-wise return to duty protocol has been shown to get SMs back to full duty safely and reduce long-term complications. Returning a SM too soon places the individual and their unit at risk. Concussion can cause temporary disruption of mental and physical functioning, impairing reaction time, balance, marksmanship, etc. The SM should return to their medical provider and undergo a Return to Duty Screening before they may be returned to full duty.

**Question:** Which patients can benefit from the PRA?

**Answer:** The PRA is designed for use in active-duty SMs who have sustained a concussion/mTBI. However, the PRA is appropriate for concussion recovery in civilians or reservists and can be utilized by modifying the activities in each stage to meet the patient's needs or lifestyle.

### PRA ALGORITHM & PROGRESSION:

**Question:** Why are the first 3 boxes of the algorithm shaded a different color from the rest of the algorithm and what is their significance?

**Answer:** The PRA CR has incorporated aspects of the MACE 2 and combined the 2014 PRA for Primary Care Managers, the 2014 PRA for Rehabilitation Providers, and the Concussion Management Tool (CMT) into the PRA Algorithm, creating a more comprehensive product to manage concussion from point of injury to return to full duty. The MACE 2 and components of the CMT are typically used prior to entering the PRA protocol. To indicate this, we shaded the initial management steps a different color. Often, these actions are taken by providers/corpsman/medics that are outside of the SM's usual medical facility (i.e. emergency department or branch clinic).

**Question:** What special considerations should I make with SMs that have sustained multiple concussions in the past 12 months?

**Answer:** When considering the number of concussions the patient has had in the past 12 months, include the current concussion in that number. Per DoDI 6490.11, deployed SMs who have experienced two concussions in the last 12 months must spend a minimum of seven days in the PRA protocol prior to return to full duty. SMs who have experienced 3 or more concussions in the last 12 months must be referred for [Recurrent Concussion Evaluation](#). The SM must stop progression at Stage 5 and can only be returned to full duty (Stage 6) by a specialist.

**Question:** Why are SMs treated differently if deployed?

**Answer:** If a SM is exposed to a potentially concussive event (PCE) while *deployed*, DoD Instruction (DoDI) 6490.11 mandates 24 hours of rest. If the SM is exposed to a PCE while in *garrison* and *does not* meet criteria for a concussion (i.e. mechanism of injury and AOC, LOC, or PTA), 24 hours rest is not mandatory but is still encouraged.

**Question:** What would you recommend for a SM who is advancing in one area (e.g. physical activity) but struggling in another area (e.g. cognitive activity)?

**Answer:** A SM should tolerate activities in both physical/vestibular and cognitive/oculomotor categories prior to advancing to the next stage of the PRA. The PCM should use the Symptom-Guided Management table to address specific areas with high symptom burden.

**Question:** How do you treat a SM who has delayed in presenting to their PCM for days or weeks after a PCE?

**Answer:** First, determine if they have been evaluated for a concussion (e.g. in the emergency department) and if a MACE 2 has been completed. If a MACE 2 has not been completed, consider performing at the initial evaluation. Then enter the algorithm at the large rectangle labeled "Initiate PRA Stage 1." Follow the instructions, but rather than beginning at Stage 1, evaluate at which stage the SM should enter the PRA based on the timeframe since the injury and the SM's activity level and symptoms. Example: It has been seven days since the SM was injured and seen in the ED where a MACE 2 was performed and documented in the EHR. The SM's overall NSI score is very low (e.g. one for headache and one for dizziness and zeros for all other symptoms), and it is their first concussion in the past 12 months. They report being able to run a half mile before feeling a worsening headache and being able to do push-ups, pull-ups, and light resistance training. Based on these criteria, the SM could enter the PRA at Stage 4 and progress per regular instructions.

**Question:** I'm concerned that my patient won't be able to see me every three days. Are there recommendations for how to accomplish this?

**Answer:** We strongly recommend scheduling at least five follow-up appointments (every three days) at their first visit. Since the average recovery time for concussion is 15 days, this allows the SM to provide dates and times to their chain of command for awareness and planning. Most patients will complete the entire PRA progression in this time period, though some may require additional recovery time (see risk factors for protracted recovery below). You can also consider utilizing telehealth appointments with the PCM or trained support staff to complete follow-up visits. However, RTD screening will require an in-person appointment.

## Appendix E: PRA Frequently Asked Questions (FAQs)

### RETURN TO DUTY CONSIDERATIONS:

**Question:** What is the Borg scale and how does it compare to heart rate monitoring during exercise?

**Answer:** The Borg Rating of Perceived Exertion (RPE) scale helps estimate how hard someone is working (activity intensity). The Borg RPE can be multiplied by 10 to get a fairly good estimate of the individual's actual heart rate.<sup>1</sup> For example, if the SM is on a treadmill and reports a 13 (Somewhat hard, but it still feels OK to continue), their estimated heart rate would be  $13 \times 10 = 130$  bpm. Because this is only an *approximation* of heart rate, the actual heart rate can vary depending on age and physical condition.

**Question:** Why is the ANAM part of the RTD screening? What if the ANAM is not available in my setting?

**Answer:** Growing evidence supports the importance of both cognitive and physical readiness for return to duty. The ANAM is a neurocognitive assessment tool that has been normed and validated in military SMs. Additionally, many SMs have a baseline ANAM score from before their concussion, which allows for comparison. Thus, the ANAM provides the best evaluation of a SM's cognitive function in relation to their peers and their own pre-concussion performance. If the ANAM is not available, you can either refer to a nearby MTF that has ANAM testing or repeat the cognitive exam portion of the MACE 2.

**Question:** I'm deployed, and we need the SM back to duty before they have completed the full PRA for mission readiness. What should I do?

**Answer:** This clinical recommendation is intended to serve as a guideline, and while strongly encouraged to promote a safe recovery for concussed SMs, these recommendations may be superseded at medical or command discretion.

### ADDITIONAL CONSIDERATIONS:

**Question:** Why should we avoid using tramadol, acetaminophen/caffeine/butalbital, and opioids in the acute stages of concussion?

**Answer:** All of these medications can cause CNS depression and alter cognitive function, which can mimic other conditions associated with traumatic brain injury (e.g. intracranial bleed) and obscure the clinical course of TBI. The sedating effects of these medications can also be intensified in patients with head injury.<sup>2</sup> In addition, all of these medications carry high risk of dependence, tolerance, and medication overuse (rebound) headaches. Lastly, tramadol and opioids can cause nausea and vomiting, and tramadol may increase the risk of seizures.

**Question:** Why should we wait 48 hours before using nonsteroidal anti-inflammatory drugs (NSAIDs) for treatment of post-traumatic headache?

**Answer:** Use of NSAIDs for post-traumatic headache should be delayed for 48 hours following concussion due to their anti-platelet effect and the potential risk of exacerbating an evolving intracranial bleed.

**Question:** Why should SMs minimize consumption of caffeine/energy drinks and nicotine and avoid alcohol after a concussion?

**Answer:** There is limited evidence on the impact of caffeine, energy drinks, nicotine, and alcohol on concussion recovery. However, these substances can cause dehydration, disrupt sleep patterns, and worsen post-concussion symptoms resulting in a delay in return to duty. Abrupt cessation of caffeine or nicotine may result in withdrawal symptoms, therefore, we recommend SMs minimize or maintain their pre-injury levels of these substances. We recommend abstinence from alcohol as any use may exacerbate concussion symptoms including headache, dizziness, nausea, vomiting, fatigue, cognitive disturbances, depression and anxiety. Additionally, excessive alcohol use may increase fall risk, which places a SM at higher risk for a 2<sup>nd</sup> concussion.

**Question:** My patient is not progressing or is progressing very slowly. What are the risk factors for protracted recovery?

**Answer:** There are several risk factors, both pre- and post-traumatic, associated with protracted recovery following concussion. The most consistent predictor of delayed recovery is the severity of acute and subacute symptoms.<sup>3</sup> Pre-traumatic factors include female sex, history of concussion, migraine headaches, sleep disorders, and psychological conditions (including PTSD, anxiety, depression, ADHD, and substance abuse).<sup>4,5,6</sup> Post-traumatic factors include post-traumatic migraine/headache and acute dizziness.<sup>3,4</sup> Particularly relevant in the military population is the prevalence of PTSD and its potential impact on concussion recovery. The risk for PTSD is elevated two-to-three fold following concussion, and the prevalence of co-morbid PTSD and TBI has been reported to range from 10–40%.<sup>7,8</sup> During early concussion care, providers should be aware of risk factors for PTSD, including acute stress disorder (ASD), which is diagnosed when acute stress reaction (ASR) or combat or operational stress reaction (COSR) persists beyond three days. Refer to the [VA/DoD PTSD and ASD Clinical Practice Guideline](#) for more information on ASR, ASD, and PTSD.

**Question:** When is it safe for a SM to have sexual intercourse following a concussion?

**Answer:** Sexual activity can be slowly reintroduced, as with other strenuous activity, during progression through the stages. It is safe to have sex when the SM is able to do so without exacerbating symptoms. Consider fatigue, mood, and dizziness in addition to other physical symptoms. During recovery, SMs may wish to modify sexual activity (e.g. position, frequency, intensity) in order to minimize symptoms.