Return to Duty Following Concussion: Lessons Learned from Sports Concussion Management

1-2:30 p.m. (ET) Dec. 8, 2016

Presenters, Moderator

Scott C. Livingston, Ph.D., PT, ATC (presenter)

Education Division Director, Defense and Veterans Brain Injury Center, Silver Spring, Maryland

Jay Sedory, M.Ed., ATC, EMT-T (presenter)

Certified Athletic Trainer, The Basic School, United States Marine Corps, Quantico, Virginia

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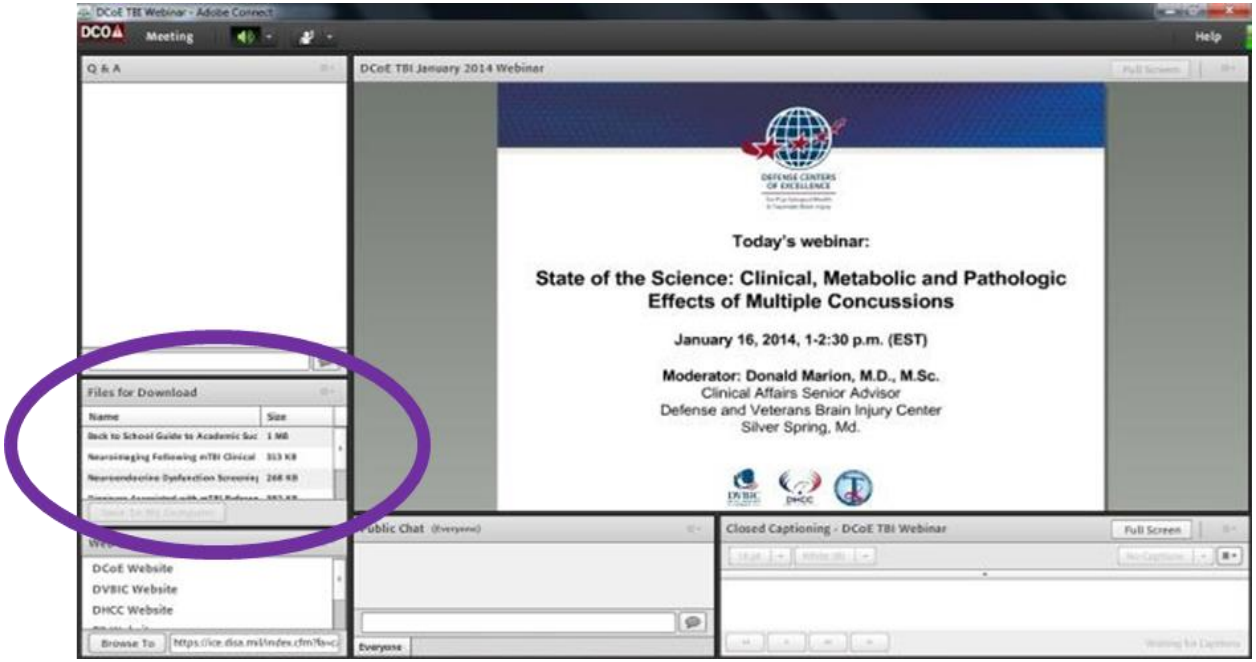
Chief of Clinical Practice and Clinical Recommendations, Defense and Veterans Brain Injury Center, Silver Spring, Maryland

Resources Available for Download

Today's presentation and resources are available for download in the "Files" box on the screen, or visit **dcoe.mil/webinars**



Webinar Details

- Live closed captioning is available through Federal Relay Conference Captioning (see the “Closed Captioning” box)
- Webinar audio is not provided through Adobe Connect
  - Dial: CONUS **888-455-0936**
  - International **773-799-3736**
  - Use participant pass code: **2431998**
- Question-and-answer (Q&A) session
- Submit questions via the Q&A box

Continuing Education Details

- All who wish to obtain continuing education (CE) credit or certificate of attendance, and who meet eligibility requirements, must register by **3 p.m. (ET) Dec. 8, 2016** to qualify for the receipt of credit.
- DCoE's awarding of CE credit is limited in scope to health care providers who actively provide psychological health and traumatic brain injury care to active-duty U.S. service members, reservists, National Guardsmen, military veterans and/or their families.
- The authority for training of contractors is at the discretion of the chief contracting official.
  - Currently, only those contractors with scope of work or with commensurate contract language are permitted in this training.

Continuing Education Accreditation
(continued)

- This continuing education activity is provided through collaboration between DCoE and Professional Education Services Group (PESG).
- Credit Designations include:
  - 1.5 AMA PRA Category 1 credits
  - 1.5 ACCME Non Physician CME credits
  - 1.5 ANCC Nursing contact hours
  - 1.5 CRCC
  - 1.5 APA Division 22 contact hours
  - 0.15 ASHA Intermediate level, Professional area
  - 1.5 CCM hours
  - 1.5 AANP contact hours
  - 1.5 COPSKT contact hours

Continuing Education Accreditation
(continued 2)

Physicians
This activity has been planned and implemented in accordance with the essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME). Professional Education Services Group is accredited by the ACCME as a provider of continuing medical education for physicians. This activity has been approved for a maximum of 1.5 hours of *AMA PRA Category 1 Credits* ™. Physicians should only claim credit to the extent of their participation.

Nurses
Nurse CE is provided for this program through collaboration between DCOE and Professional Education Services Group (PESG). Professional Education Services Group is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation. This activity has been approved for a maximum of 1. 5 contact hours of nurse CE credit. Nurses should only claim credit to the extent of their participation.

Occupational Therapists
(ACCME Non Physician CME Credit) For the purpose of recertification, The National Board for Certification in Occupational Therapy (NBCOT) accepts certificates of participation for educational activities certified for AMA PRA Category 1 Credit ™ from organizations accredited by ACCME. Occupational Therapists may receive a maximum of 1.5 hours for completing this live program.

Physical Therapists
Physical Therapists will be provided a certificate of participation for educational activities certified for AMA PRA Category 1 Credit ™. Physical Therapists may receive a maximum of 1.5 hours for completing this live program.

Continuing Education Accreditation
(continued 3)

Psychologists
This Conference is approved for up to 1.5 hours of continuing education. APA Division 22 (Rehabilitation Psychology) is approved by the American Psychological Association to sponsor continuing education for psychologists. APA Division 22 maintains responsibility for this program and its content.

Rehabilitation Counselors
The Commission on Rehabilitation Counselor Certification (CRCC) has pre-approved this activity for 1.5 clock hours of continuing education credit.

Speech-Language Professionals
This activity is approved for up to 0.15 ASHA CEUs (Intermediate level, Professional area).

Case Managers
This program has been pre-approved by The Commission for Case Manager Certification to provide continuing education credit to CCM® board certified case managers. The course is approved for up to 1. 5 clock hours. PESG will also make available a General Participation Certificate to all other attendees completing the program evaluation.

Nurse Practitioners
Professional Education Services Group is accredited by the American Academy of Nurse Practitioners as an approved provider of nurse practitioner continuing education. Provider number: 031105. This course if offered for 1.5 contact hours (which includes 0 hours of pharmacology).

Continuing Education Accreditation
(continued 4)

Physician Assistants

This activity has been planned and implemented in accordance with the essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME). Professional Education Services Group is accredited by the ACCME as a provider of continuing medical education for physicians. This activity has been approved for a maximum of 1.5 hours of *AMA PRA Category 1 Credits* ™. Physician assistants should only claim credit to the extent of their participation.

Pharmacists and Pharmacy Technicians

Professional Education Services Group is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. This program will provide a maximum of 1.5 contact hours for participants attending all conference CPE activities. Conference registration fees cover the cost of CE credit where applicable. UAN #0829-0000-16-537-L04-P/T.

Medical Coders

Medical Coders will be provided a certificate of participation for educational activities certified for AMA PRA Category 1 Credit TM. Medical Coders may receive a maximum of 1.5 hours for completing this live program.

Kinesiotherapists

This activity has been accredited by the Council on Professional Standards for Kinesiotherapy (COPSKT) for 1.5 contact hours/0.15 CEU's.

Other Professionals

Other professionals participating in this activity may obtain a General Participation Certificate indicating participation and the number of hours of continuing education credit.

Questions and Chat

- Throughout the webinar, you are welcome to submit technical or content-related questions via the Q&A pod located on the screen. **Please do not submit technical or content-related questions via the chat pod**.
- The Q&A pod is monitored during the webinar; questions will be forwarded to presenters for response during the Q&A session.
- Participants may chat with one another during the webinar using the chat pod.
- The chat function will remain open 10 minutes after the conclusion of the webinar.

Webinar Overview

Mild traumatic brain injury (TBI) affects active-duty service members at home and in deployed settings. This injury can affect performance and make the decision to return to duty challenging. Currently, health care providers use best practices and evidence from sports concussion research to help determine when a service member with mild TBI is ready to return to duty.

Presenters will describe return-to-play guidelines from sports concussion literature with applications to a military environment. They will explore the role of the certified athletic trainer in the prevention, recognition and proper management of concussions, also known as mild TBI. Presenters will also highlight a standardized approach for progressive return to activity based on the sports concussion approach.

Webinar Overview (continued)

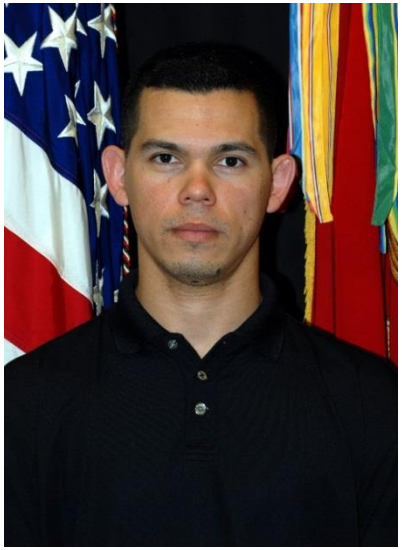
At the conclusion of this webinar, participants will be able to:

- Discuss the impact that mild TBI may have on service members and how providers can determine when they are ready to return to duty.
- Articulate approaches for evaluating service member readiness for duty after concussion.
- Describe the role of the certified athletic trainer in the prevention, recognition, evaluation and management of people with mild TBI.
- Apply a standardized process for service members and athletes recovering from concussion.

Scott Livingston, Ph.D., PT, ATC

- DVBIC Education Division director
- Physical therapist (28 years), certified athletic trainer (15 years), athletic director experience in the Navy, Medical Service Corps (8 years)
- Educator: Undergraduate sport and exercise science; graduate physical therapy, athletic training, rehabilitation sciences (15 years)
- Researcher (12 years) in sports-related mild TBI (electrophysiologic and balance assessment)
- Education
  - B.S., Physical Therapy, Ohio University
  - M.S., Advanced Physical Therapy, University of North Carolina at Chapel Hill
  - Ph.D., Education/Kinesiology (Sports Medicine), University of Virginia

Jay Sedory, M.Ed., ATC, EMT-T



- Athletic trainer, The Basic School, United States Marine Corps, Base Quantico
- Adjunct professor, athletic training, George Mason University
- Past president, Virginia Athletic Trainers' Association
- Instructor, Counter Narcotics and Terrorism Operational Medical Support (CONTOMS)
- Education
  - M. Ed., University of Virginia

Disclosures – Scott Livingston, Ph.D., PT, ATC

- The views expressed in this presentation are those of the presenter and do not reflect the official policy of the Department of the Army, Department of Defense, or DVBIC.
  - I have no relevant financial relationships to disclose.
  - I do not intend to discuss devices, products or procedures which are off-label, unlabeled, experimental, and/or investigation (not FDA approved).

Polling Question- 1

My primary discipline is

a. Primary care provider
b. Rehabilitation provider
c. Behavioral health provider
d. Nurse
e. Social worker/case manager
f. Dietician
g. Athletic trainer
h. Other

Overview

- Introduction and scope of the problem
- Evaluating readiness to return to duty
- Unique role of the Certified Athletic Trainer in concussion prevention and management
- Standardized Progressive Return to Activity (PRA) following Mild TBI/Concussion
- Summary and conclusions

Part 1. Introduction and Scope of the Problem

Arizona Community Press – OP-ED: Hasan/Bales

Connecticut Sports Law: Framing the Issues: Concussions and Sports

TBI Statistics

DoD Numbers for Traumatic Brain Injury
Worldwide – Totals

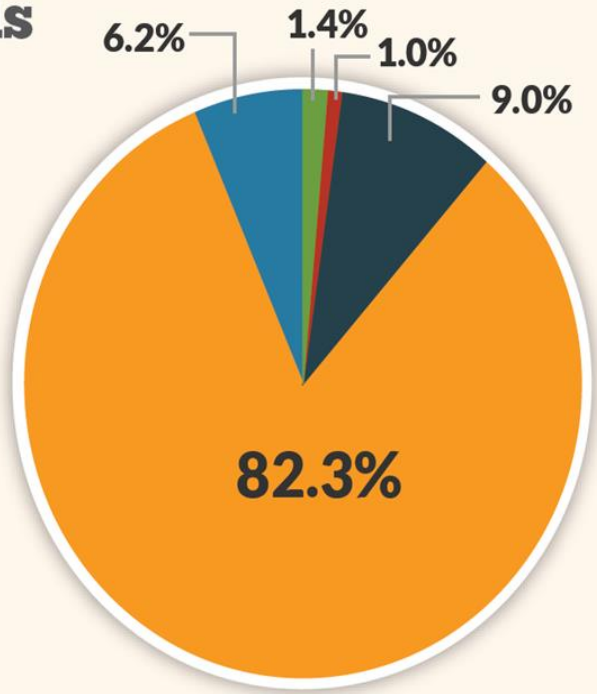
2000-2016 (Q1-Q2)

Penetrating	5,024
Severe	3,696
Moderate	31,853
Mild	290,214
Not Classifiable	21,832
Total - All Severities	**352,619**

Source: Defense Medical Surveillance System (DMSS), Theater Medical Data Store (TMDS) provided by the Armed Forces Health Surveillance Center (AFHSC)

Prepared by the Defense and Veterans Brain Injury Center (DVBIC)

*Percentages do not add up to 100% due to rounding



2000-2016 (Q1-Q2) , as of Aug 12, 2016

http://dvbic.dcoe.mil/dod-worldwide-numbers-tbi

Department of Veterans Affairs (VA)/Department of Defense (DoD) Clinical Practice Guideline for the Management of Concussion-Mild Traumatic Brain Injury (2015)

- 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 a 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

(Department of Veterans Affairs (VA)/Department of Defense (DoD), 2015)

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) Score (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 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]

(VA/DoD, 2015)

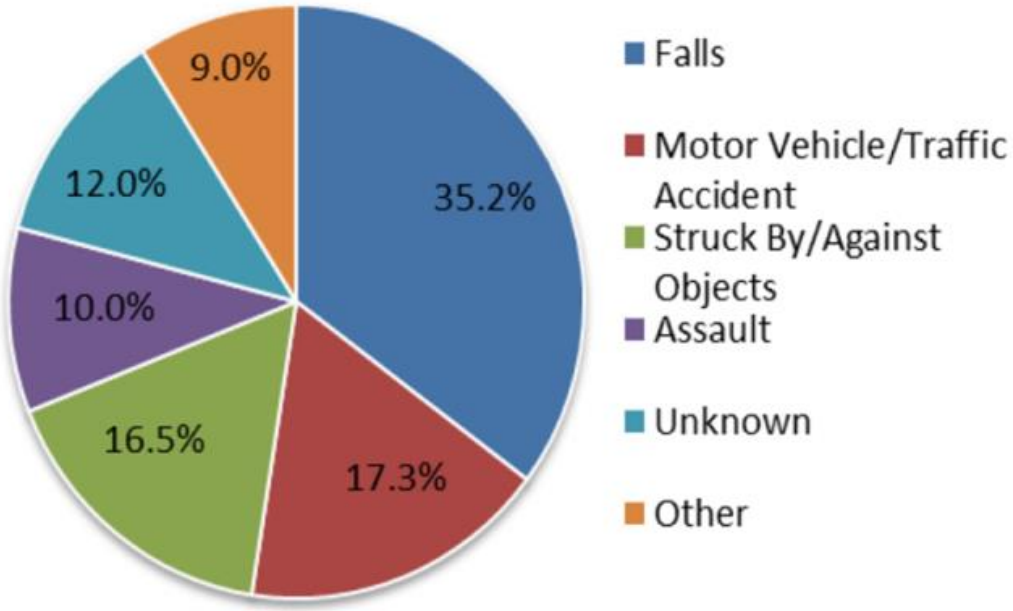
Polling Question - 2

What of the following is the overall leading cause of mild TBI/concussion in the U.S. military?

a. Unknown
b. Assault
c. Being struck by or against an object
d. Motor vehicle collisions (including rollover accidents)
e. Falls
f. Sports/recreational activity

Incidence of TBI in the DoD

Leading causes of mild TBI in the military



(Defense and Veterans Brain Injury Center, 2015)

Scope of the Problem

- Blast/explosion injuries account for 78-80% of deployed TBI. (Owens et al., 2008; Hoge et al., 2008)
- Blast/explosive injury versus blunt head trauma: Clinical presentation, expectations of recovery (French et al., 2012; Luethcke, Bryan, Morrow, & Isler, 2011; Wilk et al., 2010)
- Approximately 80% of military TBIs are diagnosed in non-combat environments. (Regasa, Gill, Marion, & Ivins, 2015)
- Challenges of management for TBI sequelae and potential impact on readiness

Impact on Operational Readiness

- Short-term impact of concussion symptoms
- Post-concussion activity-level deficits
- Duty-limiting barriers to participation (impact on safety and operational effectiveness)

http://c5.nrostatic.com/sites/default/files/uploaded/pic_related_080814_SM_Military-Readiness-DVIDS.jpg

Short-term Impacts of Concussion*

Defense Health Agency

Symptoms	Manifestation	Impact
• Headache • Sleep disturbance • Fatigue • Dizziness /balance problems • Visual disturbance and light sensitivity • Ringing in ears • Slowed thinking • Difficulty finding words • Poor concentration • Memory problems • Anxiety /depression • Irritability /mood swings	• Failure to sleep at night • Decreased energy • Slower reaction time • Difficulty negotiating uneven terrain • Easily distracted • Difficulty processing multiple sources of information • Interpersonal problems	• Poor marksmanship • Decreased situational awareness • Difficulty performing quickly under time pressures • Difficulty multi-tasking: such as driving a vehicle while listening to instructions via radio • Performance difficulties that can affect self-esteem and confidence • Fear of performing in certain operational environments

*(Crunkhorn, Maxfield, Panker, & Lowe, 2015)

Impact on Operational Readiness
(continued)

- Post-concussion activity-level deficits (Scherer, Weightman, Radomski, Davidson, & McCulloch, 2013)
- Examples:
  - Impaired marksmanship
  - Degraded situational awareness
  - Difficulty engaging in radio communications

- Duty-limiting barriers to participation (Scherer et al., 2013)
- Examples:
  - Distraction or delayed reaction times during patrol
  - Degraded telecommunications
  - Unsafe/poorly executed vehicle maneuvering

➢ **Potential impact on safety and operational effectiveness**

http://abcnews.go.com/Politics/pentagon-placing-tanks-heavy-weapons-baltics-training/story?id=31748594

Part II. Evaluating Readiness to Return to Duty

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Evaluating Readiness to Return to Duty

Overview

1. Current State of mild TBI assessment and return to duty (RTD) decision-making in a military environment
2. Application of sports concussion models
3. Challenges of RTD decision-making

Evaluating Readiness to RTD - 1

- Current State of mTBI assessment and RTD decision-making in a military environment

  DoDI 6490.11: *Policy Guidance for Management of Mild Traumatic Brain Injury/Concussion in the Deployed Setting*

  - Provides comprehensive, maximum protection for service members exposed to potentially concussive events in the deployed setting

(DoD, 2012)

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http://www.washington.edu/news/2013/04/29/blast-concussions-could-cause-pituitary-deficiencies-in-war-vets

Evaluating Readiness to RTD - 1

DoDI 6490.11: *Policy Guidance for Management of Mild Traumatic Brain Injury/Concussion in the Deployed Setting*

- Describes mandatory responsibilities and processes for medical and line personnel:
  - Identifies, tracks, and ensures the appropriate evaluation and treatment of service members exposed to potentially concussive events, to include blast events
  - Requires mandatory medical evaluation and minimum 24-hour rest period, beginning at the time of the event, for all service members exposed to potentially concussive events

(DoD, 2012)

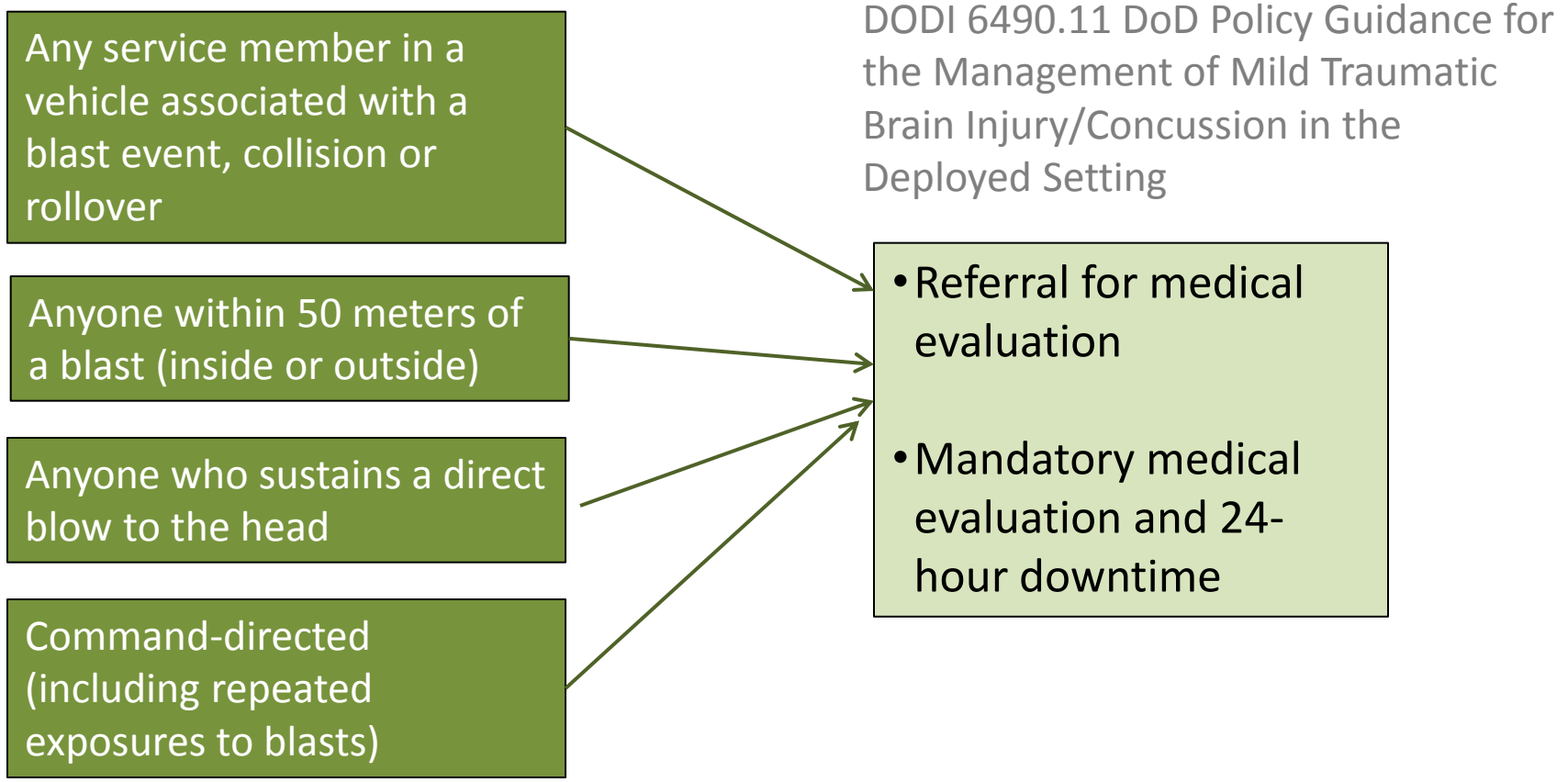
Polling Question - 3

Which of the following criteria are used by the DoD to identify a *potentially concussive event*?

a. Involvement in a vehicle collision, rollover, or blast event
b. Anyone located within 50 meters of a blast (whether inside or outside)
c. Anyone who sustains a direct blow to the head (regardless of cause – e.g. assault, sports/recreational activity, training activity)
d. Exposure to more than one blast event
e. Command-directed
f. All of the above
g. None of the above

Evaluating Readiness to RTD – 1

Mandatory Event Screening and Reporting



(DoD, 2012)

Potentially Concussive Events

- Service members involved in any of the following events, ***<u>even during non-duty hours</u>***, will receive a mandatory concussion evaluation by a medical provider:
  - Involvement in a **vehicle collision or rollover**
  - A **blow to the head** during activities such as training, sporting/ recreational activities, or combatives
  - **Within 50 meters of a blast** (inside or outside)
  - **Command-directed** such as, but not limited to, repeated exposures to events listed above, and in accordance with environmental sensor (i.e. helmet sensor, blast gauge, etc.) protocols

(DoD, 2012)

Mandatory Event Reporting

Potentially Concussive Events:

1. Involvement in a vehicle blast event, collision or rollover
2. A direct blow to the head or witnessed loss of consciousness
3. Presence within 50 meters of a blast (inside or outside)
4. Exposure to more than one blast event/Command-directed

(DoD, 2012)

Medical Requirements

- Utilize the Military Acute Concussion Evaluation (MACE) when screening for concussion
- Document all encounters in electronic health record, use appropriate ICD10 codes
- Utilize the Concussion Management in Deployed Settings algorithms

Line Requirements

- Check out service members using the HEADS and Improvised Explosive Device (IED) Checklist
- Ensure service members are evaluated by medical
- Report information into the BECIR* module within CIDNE**

*Blast Exposure and Concussion Incident Report, ** Combined Information data Network Exchange

Actions Following a Potentially Concussive Event

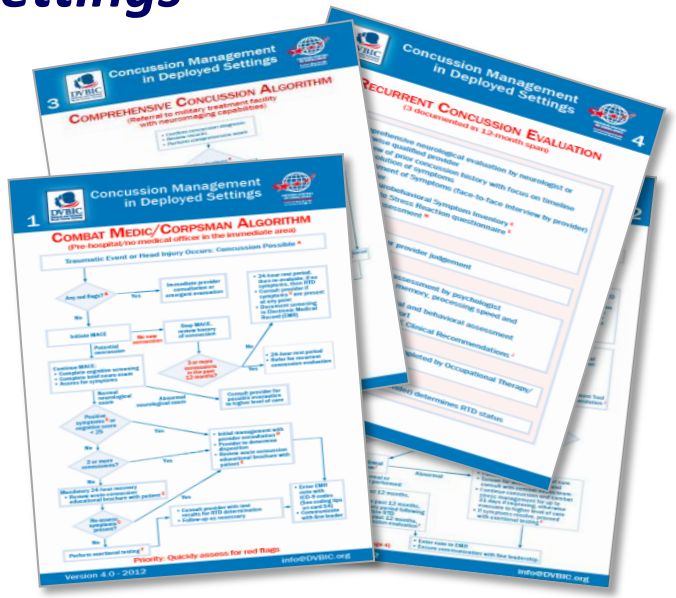
- All soldiers involved in potentially concussive events receive a medical evaluation by a medic (with provider consultation) or a health care provider as soon as possible after the event but no later than 12 hours after the event.
- Medical personnel will evaluate the soldier using the *Concussion Management in the Garrison Setting* algorithms
  - Should ideally be evaluated where the injury took place (i.e., in the field, on the sideline, etc.)
  - Can also be evaluated at the aid station, troop medical clinic, consolidated medical clinic, or military treatment facility

(U. S. Army Office of the Surgeon General, 2016)

Evaluating Readiness to RTD – 1

Concussion Management Algorithms: Deployed and In-Garrison Concussion Management

- ***Concussion Management in Deployed Settings***
  - Concussion Management Algorithm (CMA): a tool for all levels of providers on the assessment, evaluation and treatment of concussion in the deployed setting.
  - Updated in 2014 by subject matter experts from the Army, Navy, Air Force and Marine Corps, as well as DCoE, DVBIC and National Intrepid Center of Excellence.
  - Changes reflect the latest scientific research and enhance ease of use. (DVBIC, 2015)



Evaluating Readiness to RTD - 1

Current State of mild TBI assessment and RTD decision-making in a military environment

- In-theater/deployed policy guidance (DoDI6490.11)
- Concussion Management Algorithms (CMAs)
  - ❑ Concussion Management in Deployed Settings (DVBIC, 2015)
  - ❑ Concussion Management in the Garrison Setting (U. S. Army Office of the Surgeon General, 2016)

Evaluating Readiness to RTD – 1

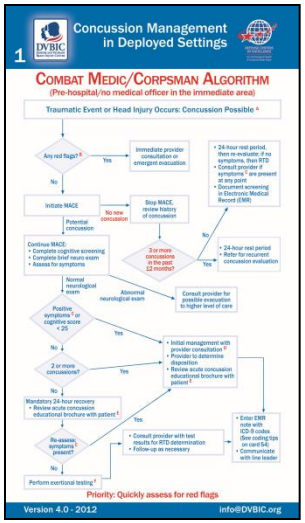
- *CMA Deployed Setting:* Combat Medic/Corpsman, Initial Provider, Comprehensive Concussion and Recurrent Concussion Evaluation algorithms
  - ❖ Key Algorithm Directives:
    - Personnel are required to use the algorithms to treat concussion in the deployed setting.
    - Mandatory event-driven protocols 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.

(DVBIC, 2015)

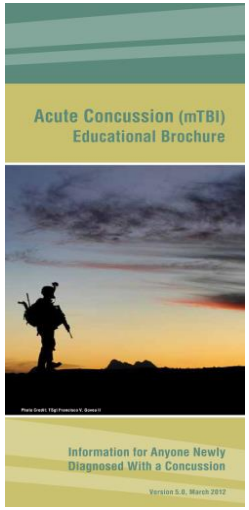
Evaluating Readiness to RTD – 1

❖ Key Algorithm Directives:

- Military Acute Concussion Evaluation (MACE) documentation will address all three MACE parts
- Service members diagnosed with concussion will be given the Acute Concussion Educational Brochure available at: dvbic.dcoe.mil
- Specific protocols for anyone sustaining ≥ 2 concussions within 12 months



https://dvbic.dcoe.mil/material/concussion-management-algorithm-pocket-cards

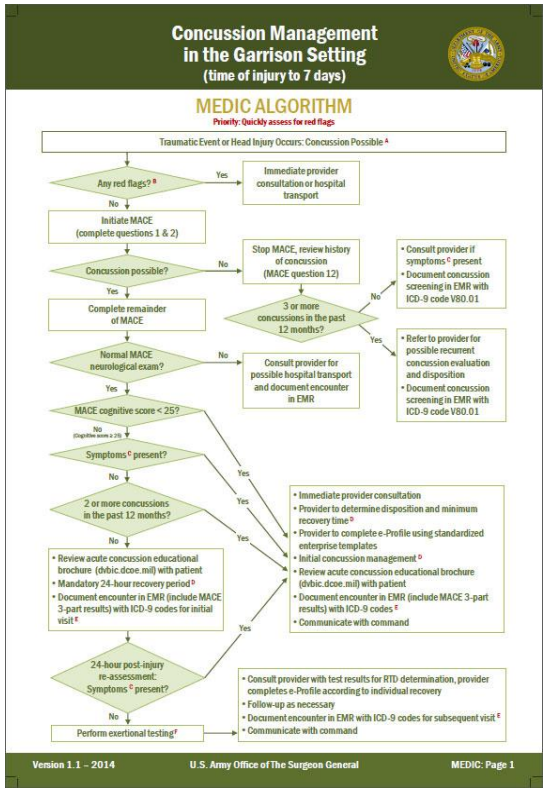


https://dvbic.dcoe.mil/material/acute-concussion-mtbi-educational-brochure

Evaluating Readiness to RTD – 1

Concussion Management Algorithms: Deployed and In-Garrison Concussion Management

- ***Concussion Management in the Garrison Setting***
  - Based on HQDA EXORD 165-13 (JUN 2013): Department of the Army Guidance for Management of Concussion/Mild Traumatic Brain Injury in the Garrison Setting
  - Mirrors theater/deployed policy
  - Event-based protocol
  - Mandates 24-hour recovery period
  - Specialized evaluations for multiple concussions



https://dvbic.dcoe.mil/material/army-concussion-management-garrison-setting-algorithm-pocket-card

Evaluating Readiness to RTD - 1

Current State of mTBI assessment and RTD decision-making in a military environment

- In-theater/deployed policy guidance (DoDI6490.11)
- Concussion Management Algorithms (CMAs)
- Current RTD Decision Criteria
  - Symptom resolution
  - Neurocognitive testing (NCT)
  - Clinical balance assessment

Polling Question - 4

What of the following clinical assessments do you predominantly use (in your practice setting) for making return-to-activity (active duty, sports, etc.) decisions? Select one.

a. Neurobehavioral Symptom Inventory (or other symptom scale)
b. Field balance assessment (such as the BESS)
c. Clinical balance assessment (such as the Sensory Organization Test)
d. Cardiovascular response (HR, BP) to exertional testing
e. Neurocognitive assessment battery (e.g. ANAM, NCAT)
f. Visual tracking
g. Functional return to duty tasks (including sport-or duty-specific skills)
h. Dual-task and multitask assessments
i. Other

Evaluating Readiness to RTD - 1

Current RTD Decision-Making

- Symptom Inventory (e.g., Neurobehavioral Symptom Inventory, NSI)
- Neurocognitive Assessment Batteries (e.g., ANAM)
- Balance and postural stability

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http://www.tilrc.org/assests/news/0112news/0112tech05.html

http://www.usmedicine.com/agencies/department-of-defense-dod/new-defenseveteran-guidelines-provide-recovery-path-for-mtbi-patients/

Application of Sports Concussion Models

- Rationale for cognitive and physical rest versus exercise
- Recommendations for activity resumption
- Symptom and impairment-based testing paradigms

http://www.drum.army.mil/mountaineer/Article.aspx?ID=7641

- Consensus Statement on Concussion in Sport: The 4th International Conference on Concussion in Sport Held in Zurich, November 2014 (McCrory et al., 2013)
- Concussion (Mild Traumatic Brain Injury) and the Team Physician: A Consensus Statement – 2011 Update (Herring et al., 2011)
- AAN Evidence-Based Guideline Update: Evaluation and Management of Concussions in Sports (Giza et al., 2013)
- AMSSM Position Statement: Concussion in Sport (Harmon et al., 2013)

Challenges of RTD Decision-Making

- Limitations of symptomatology, NCT and balance assessment
- Functional RTD assessments and tasks
- Psychometric and practical issues
- Persistent post-concussion sequelae
- Co-occurring conditions
- Multiple concussions

https://mightymarinemom.wordpress.com/category/military-parent/page/2/

http://www.pbs.org/pov/wheresoldierscomefrom/traumatic-brain-injury/

Challenges of RTD Decision-Making

Functional RTD Assessments and Tasks

- ✓ *Exertional testing* (e.g., push-ups, treadmill running, step aerobics) (Scherer & Schubert, 2009)
- ✓ *2-minute RTD exertion test*
  - Functional RTD tasks (e.g., donning & doffing body armor & helmet, road marching w/load, sprinting) at 65-85% (age-predicted) maximum heart rate (Lovell, Collins & Bradley, 2004; DVBIC, 2008)
- ✓ *Scenario-based RTD Programs (*competencies in warrior performance tasks, e.g., marksmanship, land navigation, battle drills) (Scherer et al., 2013)

Functional RTD Assessments and Tasks

- *Assessment of Military Multitasking Performance (AMMP)*
  (Radomski et al., 2013)
  - Integrates dual-task and multitask assessment paradigms with functional military tasks
  - Permits selection of appropriate, individualized test tasks to assess broad range of duty-limiting symptoms and deficits

http://www.theptdc.com/wp-content/uploads/2012/07/medium_4472636989.jpg

https://majastevanovich.files.wordpress.com/2010/02/army_mil-53554-2009-10-20-131053.jpg

Functional RTD Assessments and Tasks (cont)

Assessment of Military Multitasking Performance (AMMP) (Radomski et al., 2013)

AMMP Tasks:

- Illinois Agility Test (dual task)
- Step Initiation – Stroop Test (dual task)
- Radio Chatter-Magazine Load (dual task)
- ISAW-Grid (dual task)
- SALUTE (multitask)
- Run, Roll, Aim (multitask)
- CQ Duty (multitask)

http://www.alldayfitness.com/wp-content/uploads/2014/02/ArmyPRT2.jpg

http://www.jtfgtmo.southcom.mil/xWEBSITE/photos/photos/2011/07%20July/27JUL11.jpg

Challenges of RTD Decision-Making

- Limitations of symptomatology, NCT and balance assessment
- Functional RTD assessments and tasks
- Psychometric and practical issues
- Persistent post-concussion sequelae
- Co-occurring conditions
- Multiple concussions

https://mightymarinemom.wordpress.com/category/military-parent/page/2/

http://www.pbs.org/pov/wheresoldierscomefrom/traumatic-brain-injury/

Part III. Unique Role of the Certified Athletic Trainer in Concussion Prevention & Management

http://media.defense.gov/2016/Feb/02/2001339393/888/591/0/160128-F-PU339-001.JPG

https://www.army.mil/e2/c/images/2014/01/31/330060/size0.jpg

Disclosures – Jay Sedory, M.Ed., ATC, EMT-T

- The views expressed in this presentation are those of the presenter and do not reflect the official policy of the Department of the Army, Department of Defense, or DVBIC.
  - I have no relevant financial relationships to disclose.
  - I do not intend to discuss devices, products or procedures which are off-label, unlabeled, experimental, and/or investigation (not FDA approved).

Unique Role of Athletic Trainers (AT) in Concussion Prevention and Management

- ATs are highly qualified, multi-skilled health care professionals who collaborate with physicians to provide preventative services, emergency care, clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions. (NATA Board of Directors, Jan 2013)
- Education
  - Bachelor's/ Master's level education
- Experience
  - Traditional setting: College/university and
  - Non-traditional settings: Military, clinic, workforce, Concussion centers

NATIONAL ATHLETIC TRAINERS' ASSOCIATION
HEALTH CARE FOR LIFE & SPORT

Tactical Athlete Definition

- Marine Corps Community Services (MCCS) definition: A tactical athlete is an individual who trains for combat readiness using a comprehensive athletic approach. Tactical athletes use all facets of strength, power, speed and agility to improve their combat fitness level to their highest potential

(U.S. Marine Corps photo by Sgt. Melissa J. Marnell, Office of the Sergeant Major of the Marine Corps/Released)

ATs in the Department of Defense

"Medically Ready Force…Ready Medical Force"

Prevention

- Having/practicing the Emergency Action Plan
- Equipment fitting and removal
- Facilitation and establish baseline testing
- Education to staff and student population

U.S. Marine Corps photos by Sgt. Melissa J. Marnell, Office of the Sergeant Major of the Marine Corps/Released

Field Care, Clinical Evaluation and Follow Up

- Field care
  - Emergency evaluation and stabilization
  - Safety checks
- Clinic evaluation and follow up

(U.S. Marine Corps photos by Sgt. Melissa J. Marnell, Office of the Sergeant Major of the Marine Corps/Released)

Management

- Management
  - Daily interaction and symptoms review
  - Documentation, referral, and communication with other providers
  - Progressive exercise and return to activity
    - 6 Step Program
    - Specific restrictions to schedule and training

Standards-based RTD Models: Foundations

- Warrior tasks
  - Hiking, sprinting, lifting
  - Land Navigation, Endurance/Obstacle course, order development
- Battle drills
  - Buddy rushes, Convey operations, 9-line evacuation

U.S. Marine Corps photos by Sgt. Melissa J. Marnell, Office of the Sergeant Major of the Marine Corps/Released)

Environmental Factors

- Dangerous environment
  - Acute stress
- Sustained operational tempo (sleep deprivation)
  - Fatigue
  - Poor psychomotor and cognitive
- Extreme heat/humidity (dehydration)
  - Symptoms with headache, nausea
- Extreme altitude (altitude sickness, decreased cardiovascular function)
  - Poor functional capacity
  - Nausea

Potential Vulnerabilities

- Previous blast exposure/concussion history
- Premorbid IQ Premorbid technical and tactical proficiency
- Coping strategy
- Resilience and self-efficacy
- Consultation with leadership and peers before RTD

Part IV. Standardized Progressive Return to Activity following mTBI

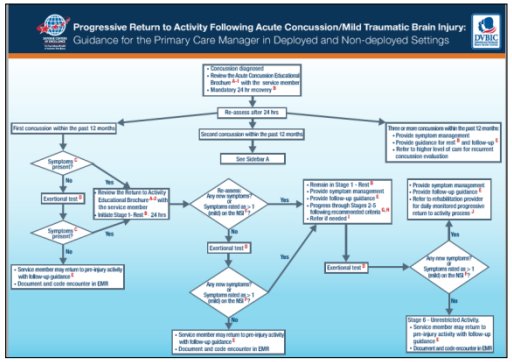
https://govbooktalk.files.wordpress.com/2012/07/female-soldiers-training.png

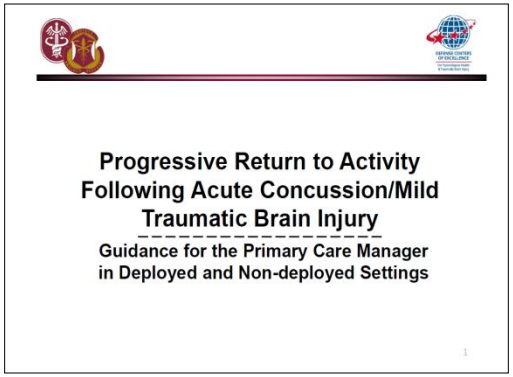
https://phc.amedd.army.mil/topics/discond/ptsaip/PublishingImages/Running.jpg

Progressive Return to Activity (PRA) Clinical Recommendation

- Provides clear guidance on progressive return to activity following mTBI after the mandatory recovery period
- Separate products for primary care manager and for rehabilitation providers
- Promotes standardization of care following mTBI

(DVBIC, 2014)





PRA Following Mild TBI: Conclusion

- Role of PRA recommendations is to provide guidance for primary care and rehabilitation providers to direct service members through a progressive return from rest to their pre-injury activity level.
- PRA clearly defines rest and activity for each stage of progression.
- Progression is measured in three domains: physical, cognitive, and vestibular/balance.
- Progressive return to activity does not begin until after mandatory 24 hours of rest is completed.
- Progression through stages is based upon: no NSI symptoms above 1 (mild), no new symptoms, normal resting HR and BP.

For additional information and/or product request please visit

dvbic.dcoe.mil

Progressive Return to Activity Approach

Service member may enter the PRA process if:

First Concussion

- SM experiences symptoms greater than 1 (mild) after 24 hours in Stage 1 (Rest) **or** after exertional testing.

Second concussion in the past 12 months

- All service members who have sustained a second concussion within 12 months must enter the PRA process.
- Service members must have **seven consecutive days** of symptom resolution (defined as symptoms of 0-1 or mild) at Stage 1 and 2 before completing Stages 3-5.

(DVBIC, 2014)

Progressive Return to Activity

The PRA protocol measures three domains as parameters for ongoing evaluation: (NOTE: The patient does not need to do all of the activities on the handout to advance (examples provided as recommendations only).

- Physical Progression
  - Includes activities from extremely light physical exertion to resistance training with maximum exertion tolerated (e.g., heavy military job tasks)
- Cognitive Progression
  - Includes activity with very low cognitive demand (e.g., leisure reading) to activities that require multitasking or complex problem solving
- Vestibular and Balance Progression
  - Includes activities with slow and limited range of head and body movement to activities that involve dynamic balancing and challenge greater vestibular needs (e.g., swimming with flip turns)

Stages of Progressive Activity

Rehabilitation Stages	Description
Stage 1	Rest (minimum 24 hours)
Stage 2	Light Routine Activity
Stage 3	Light Occupation-oriented Activity
Stage 4	Moderate Activity
Stage 5	Intensive Activity
Stage 6	Unrestricted Activity

STOP and do NOT progress to stage 2 if symptoms greater than 'mild' or new symptoms present on NSI!

(DVBIC, 2014)

PRA – Key Takeaways

- Recent evidence shows that prolonged bed rest is not recommended and should not be used.
- PRA provides a structured protocol for return to activity that leads to safer return to normal activities.
- Recommendations differ based on concussion history (e.g., first vs. second concussion).
- Recommendations are available for primary care managers and rehabilitation providers.

Stage 1: Rest

Objective:

- Extremely light physical, cognitive and vestibular-balance activities with the goal of symptom resolution

Activity and rest guidelines:

- Primarily rest with extremely limited cognitive activity
- Basic activities of daily living and extremely light leisure activity
- Extremely light vestibular-balance activity is permitted, including walking on level surfaces and limited head movements
- NO work, exercise, driving, video games, drinking alcohol

Service member may return to pre-injury activity with follow-up guidance if NO symptoms are present (following exertional testing) after Stage 1

Stage 2: Light Routine Activity

Objective:

- Initiate and promote limited effort.
- Activity limited to 30 minute intervals or less followed by four hours of rest

Activities:

- Outdoor or indoor light physical activities, such as stretching, walking, stationary cycling at low pace and resistance
- Cognitive activities such as computer use, leisure reading, and simple board games
- Vestibular and balance activities such as climbing stairs, putting on boots, and bending tasks
- NO video games, driving, resistance training, repetitive lifting, sit-ups, push-ups or pull-ups

Stage 3: Light Occupation-oriented Activity

Objective:

- Increase intensity and complexity of exercise and cognitive activity.

Activities (in addition to previous stage):

- Physical: Lift and carry objects less than 20 lbs., use elliptical or stair climber machines, or light military tasks such as cleaning equipment.
  - Maximum 60 minutes followed by 4 hours of rest
- Cognitive activities such as increasing exposure to light and noise, performing a maintenance check on vehicle or shop for one item
  - Maximum 30 minutes followed by 60 minutes of rest
- Balance activities including walking on uneven terrain, swimming (avoiding flip turns) or standing on one foot
- NO video games, driving, combatives or collision sports

Stage 4: Moderate Activity

Objective:

- Increase in intensity and complexity of exercise and cognitive activity to match demands of occupation

Activities (in addition to previous stage):

- Physical activities such as brisk hike, jogging to running as tolerated, light resistance training or non-contact sports
  - Maximum 90 minutes followed by 6 hours of rest
- Cognitive activity with greater demand such as video games, land navigation, driving simulator, weapons simulator or target practice
  - Maximum 40 minutes followed by 80 minutes of rest
- Vestibular/balance activities with greater demand such as swimming with flip turns, jump rope
- NO driving, combatives or collision sports

Stage 5: Intensive Activity

Objective:

- Duration/intensity of activity parallels service member's typical role, function and tempo.

Activity (in addition to previous stage):

- Resume usual physical exercise routine.
  - Duration limited only if symptomatic
- Cognitive activities may include: driving (as appropriate), weapons simulator or target practice, multitasking, problem solving
  - 50 minutes maximum
- Greater exercise intensity and dynamic balance: running, patrol duty, jump landing, use of night vision goggles
- NO combatives or collision sports

Stage 6: Unrestricted Activity

Objective: Resume pre-injury activities.

Activity (in addition to previous stage): Unrestricted

Return to provider if symptoms return

Image has been removed due to copyright laws.

DoD Photo, by Sgt. Jeffrey Alexander (3rd Brigade Combat Team)

Self-Directed Progression Across Stages

Primary care providers guide service member in self-directed progression. Provide educational materials to support the service member.

Conditions that apply at all stages and should be met for the service member to progress:

1. Each stage lasts a minimum of 24 hours and specifies what activities are permitted.

2. Neurobehavioral Symptom Inventory (NSI) is completed daily every morning.

3. Service member may move to the next stage only if symptoms are reported as not greater than 1 (mild) and there are no new symptoms on NSI.

PRA for Multiple Concussions

- Second Concussion within Past 12 Months
  - Review Return to Activity Educational Brochure with service member
  - Initiate Stage 1 (rest) 24 hours
  - Reassess: Any new symptoms? Symptoms rated as >1 (mild) on NSI?
    - ❑ If NO: Provide follow-up guidance; Progress and hold at Stage 2 for minimum 5 additional days of symptom resolution; Refer if needed.
    - ❑ If YES: Remain at Stage 1 (rest), provide symptom management, provide follow-up guidance, refer to rehabilitation provider for daily monitored PRA process.

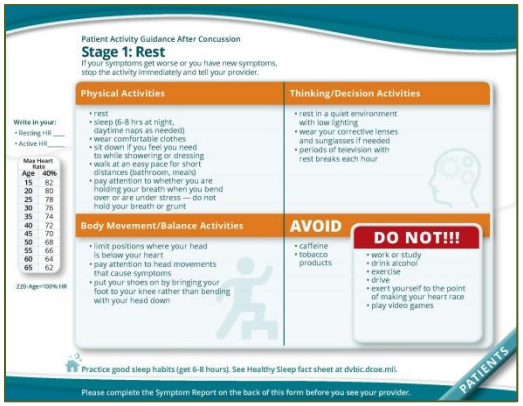
Clinician-Directed Progression Across Stages

- The following criteria apply at all stages of PRA and should be met for the service member to progress:
  - No new symptoms
  - No symptoms above rating of 1 (mild) on **NSI**
  - Resting blood pressure (BP) not to exceed **140/90 mm Hg**
  - Resting heart rate (HR) not to exceed **100 bpm**
- Activity to rest intervals must be followed as defined
  - Example: Stage 3 (Light Occupational-oriented Activity) - maximum of 60 minute physical activity periods followed by four hours of rest (1:4 ratio)
- If criteria are not met, return to the prior stage.

PRA for Multiple Concussions

- Three or More Concussions within Past 12 Months
  - Provide symptom management
  - Provide guidance for rest and follow-up
  - Refer to higher level of care for recurrent concussion evaluation

Access at: https://dvbic.dcoe.mil/material/progressive-return-activity-rehab-pes


Patient Activity Guidance After Concussion

Stage 1: Rest

If your symptoms get worse or you have new symptoms, stop the activity immediately and tell your provider.

Physical Activities

- rest
- sleep (6-8 hrs at night, daytime naps as needed)
- wear comfortable clothes
- sit down if you feel you need to while showering or dressing
- walk at an easy pace for short distances (bathroom, meals)
- pay attention to whether you are holding your breath when you bend over or are under stress — do not hold your breath or grunt

Thinking/Decision Activities

- rest in a quiet environment with low lighting
- wear your corrective lenses and sunglasses if needed
- periods of television with rest breaks each hour

Write in your:
- Resting HR ____
- Active HR ____

Max Heart Rate

Age	40%
15	82
20	80
25	78
30	76
35	74
40	72
45	70
50	68
55	66
60	64
65	62

220-Age=100% HR

Body Movement/Balance Activities

- limit positions where your head is below your heart
- pay attention to head movements that cause symptoms
- put your shoes on by bringing your foot to your knee rather than bending with your head down

AVOID

- caffeine
- tobacco products

DO NOT!!!

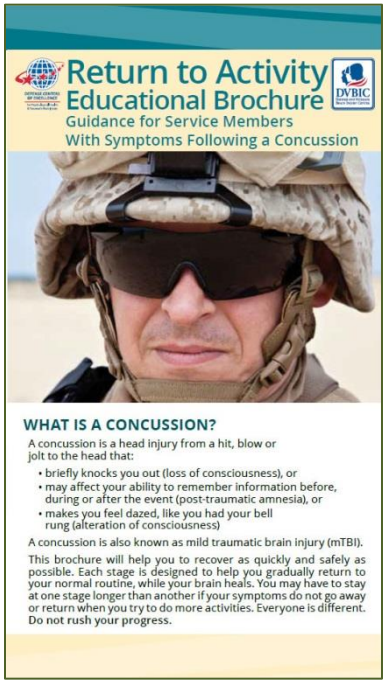
- work or study
- drink alcohol
- exercise
- drive
- exert yourself to the point of making your heart race
- play video games

Practice good sleep habits (get 6-8 hours). See Healthy Sleep fact sheet at dvbic.dcoe.mil.

Please complete the Symptom Report on the back of this form before you see your provider.

PATIENTS

Access at: https://dvbic.dcoe.mil/material/progressive-return-activity-a2


Return to Activity Educational Brochure

Guidance for Service Members With Symptoms Following a Concussion

WHAT IS A CONCUSSION?

A concussion is a head injury from a hit, blow or jolt to the head that:

- briefly knocks you out (loss of consciousness), or
- may affect your ability to remember information before, during or after the event (post-traumatic amnesia), or
- makes you feel dazed, like you had your bell rung (alteration of consciousness)

A concussion is also known as mild traumatic brain injury (mTBI).

This brochure will help you to recover as quickly and safely as possible. Each stage is designed to help you gradually return to your normal routine, while your brain heals. You may have to stay at one stage longer than another if your symptoms do not go away or return when you try to do more activities. Everyone is different. Do not rush your progress.

Polling Question - 5

How likely are you to use the Progressive Return to Activity Clinical Recommendation (for PCM or Rehabilitation Providers or both) in managing concussion in a military/civilian practice setting?

a. Highly likely
b. Somewhat likely
c. Somewhat not likely
d. Not Likely at all

Summary

- Mild TBI/concussion is a common injury affecting active duty service members in garrison and deployed settings.
- Potential for significant impact of mTBI on warfighter performance and operational readiness
- A standardized approach for progressive return to activity (PRA), building from sports concussion literature, has been established by DVBIC.
- The ATC plays a unique role in concussion prevention, recognition and management, including RTD decision-making.

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