The Triad of PTSD, TBI and Substance Abuse

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Disclosure

• Anthony Dekker, DO has presented numerous programs on Chronic Pain Management and Addiction Medicine. The opinions of Dr Dekker are not necessarily the opinions of the DoD, US Army, Indian Health Service or the USPHS. Dr Dekker has no conflicts to report.
IEDs in Iraq

IE D FOUND RECENTLY VIC MAHMUDIYAH

LINK TO BURIED EXPLOSIVE

PLASTER OF PARIS

ANTENNA
Traumatic Brain Injury

Explosions
Blast Injury

Primary: Direct exposure to over pressurization wave
IED: Improvised Explosive Device
New Humvee
MHS TBI Occurrence

2000-2010Q3: TBI Categories
(Penetrating/Severe/Moderate/Mild/Not Classifiable):

2000-2010Q3

- Penetrating: 3,367
- Severe: 2,038
- Moderate: 33,020
- Mild: 150,222
- Not Classifiable: 6,900

TOTAL - All Severity: 195,547

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Source: Health.mil website
DoD TBI Definition (Oct 07)

• Traumatically induced structural injury or physiological disruption of brain function as a result of external force to the head

• New or worsening of at least one of the following clinical signs
  – Loss of consciousness or decreased consciousness
  – Loss of memory immediately before or after injury
  – Alteration in mental status (confused, disoriented, slow thinking)
  – Neurological deficits
  – Intracranial lesion

• DoD definition parallels standard medical definition
  – CDC, WHO, AAN, ACRM

The diagnosis of TBI is made by determining what happened to brain function at the time of the event – this requires taking a history from the individual.
Pathology

- Rotational injuries lead to diffuse shearing of small vessels
- Diffuse axonal injury is underlying lesion
MACE: Military Acute Concussion Evaluation

- Developed by DVBIC and released in Aug 2006
- Performed by medical personnel
- 3-Part Screening Tool – “CNS”
  - Cognition
  - Neurological Exam
  - Symptoms
- Alternate versions available
- Upcoming revision will include recurrent concussion questions
- Can be used during exertional testing to ensure that cognitive function remains intact
Evaluate each domain. Total possible score is 30.

IX. Orientation: (1 point each)

<table>
<thead>
<tr>
<th>Month:</th>
<th>0</th>
<th>1</th>
</tr>
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<tbody>
<tr>
<td>Date:</td>
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<tr>
<td>Day of Week:</td>
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<td>1</td>
</tr>
<tr>
<td>Year:</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Time:</td>
<td>0</td>
<td>1</td>
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</tbody>
</table>

Orientation Total Score _____/5

X. Immediate Memory:
Read all 5 words and ask the patient to recall them in any order.
Repeat two more times for a total of three trials. (1 point for each correct, total over 3 trials)

<table>
<thead>
<tr>
<th>List</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elbow</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Apple</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Carpet</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Saddle</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bubble</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Trial Score</td>
<td></td>
<td></td>
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</table>

Immediate Memory Total Score _____/15

XI. Neurological Screening
As the clinical condition permits, check
Eyes: pupillary response and tracking
Verbal: speech fluency and word finding
Motor: pronator drift, gait/coordination

Record any abnormalities. No points are given for this.
XII. **Concentration**
Reverse Digits: (go to next string length if correct on first trial. Stop if incorrect on both trials.) 1 pt. for each string length.

<table>
<thead>
<tr>
<th>String Length</th>
<th>Reverse Digits</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-9-3</td>
<td>6-2-9</td>
<td>0</td>
</tr>
<tr>
<td>3-8-1-4</td>
<td>3-2-7-9</td>
<td>0</td>
</tr>
<tr>
<td>6-2-9-7-1</td>
<td>1-5-2-8-5</td>
<td>0</td>
</tr>
<tr>
<td>7-1-8-4-6-2</td>
<td>5-3-9-1-4-8</td>
<td>0</td>
</tr>
</tbody>
</table>

Months in reverse order: (1 pt. for entire sequence correct)
Dec-Nov-Oct-Sep-Aug-Jul-Jun-May-Apr-Mar-Feb-Jan
0 1

**Concentration Total Score** ____/5

XIII. **Delayed Recall** (1 pt. each)
Ask the patient to recall the 5 words from the earlier memory test (Do NOT reread the word list.)

<table>
<thead>
<tr>
<th>Word</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elbow</td>
<td>0</td>
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<td>Apple</td>
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<tr>
<td>Carpet</td>
<td>0</td>
</tr>
<tr>
<td>Saddle</td>
<td>0</td>
</tr>
<tr>
<td>Bubble</td>
<td>0</td>
</tr>
</tbody>
</table>

**Delayed Recall Total Score** ____/5

**TOTAL SCORE** ____/30
Post-Deployment Health Assessment

9.a. During this deployment, did you experience any of the following events? (Mark all that apply)
   (1) Blast or explosion (IED, RPG, land mine, grenade, etc.)
   (2) Vehicular accident/crash (any vehicle, including aircraft)
   (3) Fragment wound or bullet wound above your shoulders
   (4) Fall
   (5) Other event (for example, a sports injury to your head). Describe:

9.b. Did any of the following happen to you, or were you told happened to you, IMMEDIATELY after any of the event(s) you just noted in question 9.a.? (Mark all that apply)
   (1) Lost consciousness or got "knocked out"
   (2) Felt dazed, confused, or "saw stars"
   (3) Didn't remember the event
   (4) Had a concussion
   (5) Had a head injury

9.c. Did any of the following problems begin or get worse after the event(s) you noted in question 9.a.? (Mark all that apply)
   (1) Memory problems or lapses
   (2) Balance problems or dizziness
   (3) Ringing in the ears
   (4) Sensitivity to bright light
   (5) Irritability
   (6) Headaches
   (7) Sleep problems

9.d. In the past week, have you had any of the symptoms you indicated in 9.c.? (Mark all that apply)
   (1) Memory problems or lapses
   (2) Balance problems or dizziness
   (3) Ringing in the ears
   (4) Sensitivity to bright light
   (5) Irritability
   (6) Headaches
   (7) Sleep problems
Studies suggest TBI is a common injury in OEF/OIF

- 16% of returning Army Soldiers screened positive
- 15% of returning Army Soldiers screened positive
- 19% of OIF/OEF Veterans screened positive
- 23% of returning Army Soldiers screened positive
- 18.5% of Veterans at VA medical centers screened positive

5. Unpublished data. UNCLASSIFIED
Ft. Carson: Post-Deployment Data (n = 907)

Terrio et al., JHTR, 2009; 24, 14-23.
National Intrepid Center of Excellence

**Location:** NNMC campus, Bethesda, MD

**Lot Size:** ~3 AC

**Building Size:** ~72,000 SF

**Number of Stories:** 2

**Number of Personnel:** ~111

**Major Diagnostic / Rehabilitation Equipment:**

- Magnetic Resonance Imaging (3-T) / Functional MRI / Diffusion Tensor Imaging
- Positron Emission Tomography with Computed Tomography (PET/CT)
- Magneto encephalography (MEG) Scanner
- Trans-Cranial Doppler Ultrasound
- Fluoroscopy
- CAREN (Computer Assisted Rehabilitation Environment) system
Potential Clinical Presentation

PTSD
- Flashbacks
- Nightmares
- Attentional problems
- Depression
- Insomnia
- Anxiety
- Irritability

TBI
- Headaches
- Dizziness
- Headaches
- Dizziness
- PTSD
- Pain
- Substance Use Disorders
- Dual Sensory Impairments
- Depression
- Anxiety
- Suicide
DSM-5 Criteria - PTSD

• Re-experiencing symptoms (nightmares, intrusive thoughts)
• Avoidance of trauma cues and Numbing/detachment from others
• Hyperarousal (increased startle, hypervigilance)
• DSM-V arrive in May
Symptoms of PTSD

✓ Recurrent thoughts of the event
✓ Flashbacks/bad dreams
✓ Emotional numbness ("it don’t matter"); reduced interest or involvement in work or outside activities
✓ Intense guilt or worry/anxiety
✓ Angry outbursts and irritability
✓ Feeling "on edge," hyperarousal/hyper-alertness
✓ Avoidance of thoughts/situations that remind person of the trauma
✓ Depression
Potential Consequences of PTSD

Social and Interpersonal Problems:

- Relationship issues
- Low self-esteem
- Alcohol and substance abuse
- Employment problems
- Homelessness
- Trouble with the law
- Isolation
“What Kind of War-Zone Stressors Did Soldiers in Iraq Confront?”

- Preparedness (or lack thereof)
- Combat exposure
- Aftermath of battle
- Perceived threat
- Difficult living and work environment
- Perceived radiological, biological, and chemical weapons exposure
- Sexual or gender harassment
- Ethnocultural stressor
- Concerns about life and family disruptions

Cozza et al. 2004
Military Families

• Stressors
  – Frequent separations
  – Long work hours
  – Dangerous work environment
  – Role ambiguity during deployment

• Protective Factors
  – Behaviors (e.g., IPV) result in discharge
  – Provision of
    • Health care
    • Housing
    • Family Services

Rentz et al 2006
## Mental Health Problems Post Deployment

<table>
<thead>
<tr>
<th></th>
<th>OIF (n=222,620)</th>
<th>OEF (n=16,318)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Combat Experiences</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Any)</td>
<td>144,978 (65.1%)</td>
<td>7,499 (46.0%)</td>
</tr>
<tr>
<td><strong>Any MH Concern</strong></td>
<td>42,506 (19.1%)</td>
<td>1,843 (11.3%)</td>
</tr>
<tr>
<td><strong>Suicidal Ideation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some</td>
<td>2,411 (1.1%)</td>
<td>107 (0.7%)</td>
</tr>
<tr>
<td>A lot</td>
<td>467 (0.2%)</td>
<td>20 (0.1%)</td>
</tr>
<tr>
<td><strong>Psychiatric</strong></td>
<td></td>
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<tr>
<td>Hospitalization in the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year Post</td>
<td>1,214 (5.9%)</td>
<td>45 (2.9%)</td>
</tr>
<tr>
<td>Deployment (Distinct</td>
<td>(Distinct</td>
<td>(Distinct</td>
</tr>
<tr>
<td>Individuals)</td>
<td>Individuals)</td>
<td>Individuals)</td>
</tr>
</tbody>
</table>
PTSD and OEF/OIF

- Exposure to combat greater among those deployed to Iraq
- The percentage of study subjects who met screening criteria for major depression, generalized anxiety disorder, or PTSD
  - Iraq 15.6%-17.1%
  - Afghanistan 11.2%
Alcohol Problems Post-Deployment

• 11.8% for Active Duty

• 15.0% for Reserve/Guard
Future

• Multidisciplinary Team approach for prevention, early identification, intervention and ongoing treatment
• IOM 12 recommendations
• Update the 2009 VA DoD Substance Abuse Publication and monitor implementation
• Expand research in the treatment of TBI and its relationship to PTSD and Substance Use Disorders