

ASSESSMENT AND TREATMENT OF TBI IN OIF/OEF/OND VETERANS

Katherine Noonan, PhD
Joanna Close, MS, CCC-SLP

OBJECTIVES

- ▣ Define the profile of the returning veteran
- ▣ Define TBI and identify the spectrum of TBI severity
- ▣ Identify the primary method of diagnosing remote combat-related concussion/mTBI
- ▣ Identify course/recovery from mTBI
- ▣ Identify risk factors for persistent symptoms
- ▣ Introduce treatment recommendations
- ▣ Identify impact of co-occurring conditions on persisting symptoms
- ▣ Identify practical solutions for current subjective cognitive complaints
- ▣ Identify additional resources

PROFILE OF RETURNING VETERANS

Updated Roster of OEF/OIF/OND Veterans Who Have Left Active Duty

1,759,433 OEF/OIF/OND veterans who have left active duty and become eligible for VA health care since FY 2002

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Cumulative from 1st Quarter FY2002 through 1st Quarter FY 2014

VA Health Care Utilization from FY 2002 through 2014 (1st Qtr.) among OEF/OIF/OND Veterans

▣ Among all 1,759,433 separated OEF/OIF/OND Veterans

- **1,027,801 (~58%)*** of total separated OEF/OIF/OND Veterans have obtained VA health care since FY 2002 (cumulative total)
 - **951,723 of 1,027,801 (~93%)** only by VA and not hospitalized
 - **76,078 of 1,027,801 (~7%)** have been hospitalized at least once in a VA health care facility

*Percentages reported are approximate due to rounding.

Cumulative from 1st Quarter FY 2002 through 1st Quarter 2014

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Frequency Distribution of OEF/OIF/OND Veterans According to the VISN Providing the Treatment

Treatment Site		OEF-OIF Veterans Treated at a VA Facility ¹	
		Frequency	%
VISN 1	VA New England Healthcare System	44,496	4.3
VISN 2	VA Healthcare Network Upstate New York	28,631	2.8
VISN 3	VA New York/New Jersey Healthcare System	37,022	3.6
VISN 4	VA Stars & Stripes Healthcare System	51,269	5.0
VISN 5	VA Capitol Health Care System	41,495	4.0
VISN 6	VA Mid-Atlantic Healthcare System	80,242	7.8
VISN 7	VA Southeast Network	86,507	8.4
VISN 8	VA Sunshine Healthcare Network	83,588	8.1
VISN 9	VA Mid-South Healthcare Network	61,315	6.0
VISN 10	VA Healthcare System of Ohio	35,199	3.4
VISN 11	Veterans in Partnership Healthcare Network	47,860	4.7
VISN 12	VA Great Lakes Health Care System	51,546	5.0
VISN 15	VA Heartland Network	47,218	4.6
VISN 16	South Central VA Health Care Network	99,441	9.7
VISN 17	VA Heart of Texas Health Care Network	86,834	8.4
VISN 18	VA Southwest Healthcare Network	60,776	5.9
VISN 19	VA Rocky Mountain Network	53,974	5.3
VISN 20	VA Northwest Network	61,024	5.9
VISN 21	VA Sierra Pacific Network	53,865	5.2
VISN 22	VA Desert Pacific Healthcare Network	93,104	9.1
VISN 23	VA Midwest Health Care Network	59,738	5.8

* Veterans can be treated in multiple VISNs. A Veteran was counted only once in any single VISN but can be counted in multiple VISN categories. The total number of OEF/OIF/OND Veterans who received treatment (n = 1,027,801) was used to calculate the percentage treated in any one VISN.

¹ Percentages reported are approximate due to rounding.
Cumulative from 1st Quarter FY 2002 through 1st Quarter 2014

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Demographics of OEF/OIF/OND Veterans Utilizing VA Health Care

- ❑ Sex
 - Male 87.9%
 - Female 12.1%
- ❑ Birth Year Cohort
 - 1990 or later 2%
 - 1980-1989 48.3%
 - 1970-1979 24.7%
 - 1960-1969 19.0%
 - 1950-1959 5.2%
 - 1926-1949 .8%

Analysis of Health Care Utilization
Among OEF /OIF /OND Veterans

Demographics of OEF/OIF/OND Veterans Utilizing VA Health Care

- Branch
 - ❑ Air Force 12.9%
 - ❑ Army 59.2%
 - ❑ Marine 14.0%
 - ❑ Navy 13.8%
 - ❑ Coast Guard 0.1%
- Unit Type
 - ❑ Active duty 59.5%
 - ❑ Reserve/ Guard 40.5%
- Rank
 - ❑ Enlisted 91.1%
 - ❑ Officer 8.9%

Top Medical Diagnoses among OEF/OIF/OND Veterans

Diagnosis	ICD-9 Category	%
Musculoskeletal	710-739	59.6%
Mental Disorders	290-319	55.7%
III Defined Conditions	780-799	55.2%
Nervous System/Sense organs	320-389	48.3%
Digestive System	520-579	36.9%
Endocrine/Metabolic	240-279	35.7%
Injury/Poisoning	800-999	31.0%
Respiratory	460-519	27.9%

Mental Health Diagnoses among OEF/OIF/OND Veterans

Disease Category	ICD Code	# OEF/OIF Vets
PTSD	309.1	311,688
Depressive Disorders	311	248,891
Neurotic Disorders	300	229,361
Affective Psychoses	296	152,587
Alcohol Dependence Syndrome	303	72,055
Nondependent Drug Abuse	305	58,839
Special Symptoms, NEC	307	46,245
Drug Dependence	304	40,630

In summary....

- ▣ Majority of returning veterans are young (ages 17-31)
- ▣ Many have left their family of origin and gone directly into the military
- ▣ Returning to an unstable living environment
- ▣ Little work history outside of military
- ▣ Young families; Limited Finances

TBI DEFINITIONS AND SEVERITY

Acquired Brain Injury

Traumatic Brain Injury (TBI)
alteration in brain function, or other evidence of
brain pathology, caused by an external force.

Stroke and **anoxic** brain
injury are non-mechanically
induced Acquired Brain
Injury (ABI)



CDC Estimates

In US- 1.7m diagnosed with TBI per year

In 30% of deaths, TBI is a contributor

75% of TBI is concussion

25% considered moderate or severe TBI



DoD Numbers for Traumatic Brain Injury Worldwide – Totals

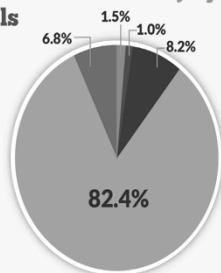
2000-2014 Q1

Penetrating	4,477
Severe	3,041
Moderate	24,777
Mild	247,904
Not Classifiable	20,508

Total - All Severities 300,707

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 may not add up to 100% due to rounding



2000-2014 Q1, as of May 7, 2014

Severity Levels
- TBI is categorized by severity level: - Concussion (mild, mTBI) - Moderate - Severe

Summarizing TBI Severity			
VA-DOD definitions			
Criteria	Mild/Concussion	Moderate TBI	Severe TBI
Loss of consciousness	None to < 30minutes	31m to 24 hours	> 24 hours
Alteration of consciousness	A moment up to 24 hours	> 24 hours	> 24 hours
Post-traumatic Amnesia	0-1 day	2-7 days	> 7 days
Glasgow coma scale acutely	13-15	9-12	< 9
Imaging findings	Normal	Normal or abnormal	Normal or abnormal

Moderate and Severe TBI
- Often have structural changes on imaging - Symptoms are significant at time of injury - Difficult to predict recovery potential - Benefits from Referral to Rehabilitation therapies and Physical Medicine and Rehabilitation/Polytrauma

Concussion

▣ Concussion is the best term

- Concussion = mTBI
- Familiar
- Implies excellent recovery

Special Category of Head injury in Combat/Blast Injuries

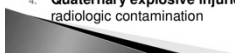
Blast injury from explosions are the hallmark injuries of the current conflicts in the Middle East (e.g. IED, RPG, mortars, car bombs).

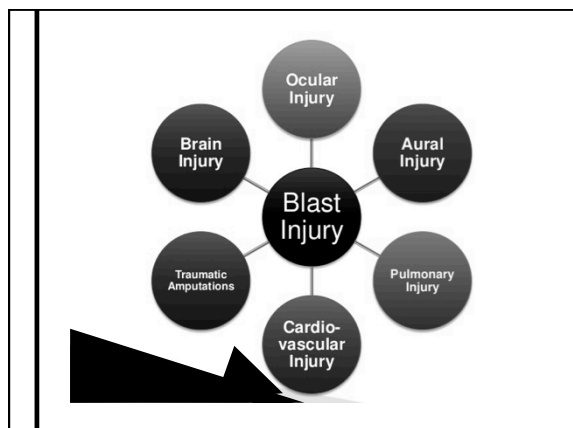


Blast Exposures

Injuries from explosions are traditionally classified into:

1. **Primary blast injuries:** injuries due solely to the blast wave
2. **Secondary blast or explosive injury:** primarily ballistic trauma resulting from fragmentation wounds from the explosive device or the environment
3. **Tertiary blast or explosive injury:** result of displacement of the victim or environmental structures; is largely blunt traumatic injuries
4. **Quaternary explosive injuries:** burns, toxins, and radiologic contamination





Blast Injuries	
	Blast injuries are unique to the current conflicts, however: - 82% of combat related TBI is concussion (mild TBI) - 80% of all current military TBI occurs OUTSIDE of deployment (not blast related)

Diagnosing Concussion	
	▣ Concussions are based on the history ▪ Currently, there is no readily available scan, blood test or cognitive testing to make the diagnosis ▪ Entirely based on a patient's report of minute-by-minute symptoms from peri-injury period

Diagnosing Concussion- 3 Key Concepts
1) Loss of Consciousness (LOC) None to < 30 minutes 2) Alteration of Consciousness (AOC) A moment up to 24h 3) Post-Traumatic Amnesia (PTA) None to < 24 hrs

Diagnosing Concussion Key 1: Loss of consciousness (LOC)
☐ LOC means that the patient was <u>UNAROUSABLE</u> for some period of time ☐ Complicating factors such as battle shock or other psychological stress are not LOC ☐ None to < 30 minutes

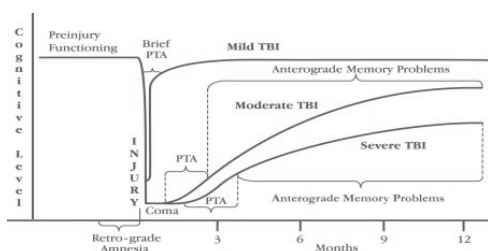
Diagnosing Concussion Key 2: Alteration of Consciousness (AOC)
☐ AOC → a period of interrupted mental functioning without loss of consciousness ☐ Complicating factors such as psychological stress are easily confused with AOC ☐ AOC indicates neurological impairment in mental functioning and is not a stress response ☐ A moment up to 24h

Diagnosing Concussion Key 3: Post-Traumatic Amnesia (PTA)

- ▣ PTA → Lack of memory after the point of injury
- ▣ None to < 24 hrs

MTBI COURSE/RECOVERY

Natural Course of Recovery



Recovery from concussion/ mTBI

See M. McCrea (2008). *Mild traumatic brain injury and postconcussion syndrome*. New York: Oxford; also, Institute of Medicine; Rohling, et al., 2011).

- ❑ Recovery begins in hours to days following concussion injury.
- ❑ Physiological recovery generally occurs within 14 days of injury.
- ❑ **Most** people return to baseline within one to three months following injury.
- ❑ There is no indication of permanent impairment on neuropsychological testing by 3 months post-injury.

Recovery from Moderate to Severe TBI

- ❑ Fastest and largest improvements are closer in time to the injury.
- ❑ Recovery can continue for up to two years post severe TBI.
- ❑ Generally, by 18-24 months following severe TBI a patient can be determined to be relatively permanent and stationary with regards to further major recovery.
- ❑ Some improvement in functional capability can continue to occur beyond 24 months, but gains are typically small.

RISK FACTORS FOR PERSISTENT SYMPTOMS RELATED TO MTBI

Risk Factors

- Demographics – female gender, older age
- Psychosocial:
 -
 -
 -
 -
- Medical
 -
 -
 -
- Situational – litigation/compensation, concurrent PTSD.

See Carroll, Cassidy, Peloso, et al., 2004. Journal of Rehabilitation Medicine; Landre, Poppe, Davis, et al., 2006; Binder & Rohling, 1996; Paniak, et al., 2002.

Post-Concussion Syndrome?

- A construct whose existence is debated. (see McCrea, 2008)
- A constellation of vague symptoms with multiple possible etiologies.

ICD-10 Symptoms Associated with Post-Concussion Syndrome

Headache
Dizziness
Fatigue
Irritability
Sleep Problems
Concentration Problems
Memory Problems
Problems tolerating stress/emotion/alcohol

Note that there are no pathognomonic features to PCS.

Frequency of Common PCS Symptoms in Non-mTBI samples (from McCrea, 2008)

	Headache	Dizziness	Irritability	Memory Problems	Concentration Problems
College Students	36%	18%	36%	17%	42%
Chronic Pain Patients	80%	67%	49%	33%	63%
Depressed	37%	20%	52%	25%	54%
PI claimants (non-TBI)	77%	41%	63%	46%	71%
mTBI	42%	26%	28%	36%	25%

Is Combat Concussion Different?

- ❑ There is no good information from the combat environment comparable to the sports concussion and civilian literature.
- ❑ However, we can make some educated hypotheses based on available research.

Vasterling, et al., (2006). Neuropsychological outcomes of Army personnel following deployment to the Iraq war. *JAMA*, 296, 519-529.

- ❑ Prospective, cohort controlled study of 961 m & f ADSM's.
- ❑ Assessed prior to and following deployment.
- ❑ Comparison group of soldiers not deployed overseas.
- ❑ Difference between deployed and non-deployed soldiers were found on:
 - Sustained attention, verbal learning, visual-spatial memory, negative affect state, and simple reaction time.
 - Deployment effects remained significant after taking into account deployment-related head injury and stress and depression symptoms.
- NOTE: Combat-related head injury did not account for differences. Being DEPLOYED is associated with change in function.

Polusney, et al. (2011). Longitudinal effects of mild traumatic brain injury and posttraumatic stress disorder comorbidity on post deployment outcomes in National Guard soldiers deployed to Iraq. *Archives of General Psychiatry*, 68, 79-89.

- ❑ 953 US National Guard Soldiers; Participants surveyed one month before returning from deployment and again one year later, after return.
- ❑ Self-report of mTBI and PTSD were assessed at times 1 and 2.
- ❑ Rate of self-reported concussion/mTBI was 9.2% at time 1 and 22.0% at time 2.
- ❑ Soldiers with reported history of concussion were more likely to report post-concussion symptoms and poorer psychosocial outcomes.
- ❑ After adjusting for PTSD symptoms, concussion status was not associated with post-deployment symptoms or outcomes.
- ❑ Time 1 PTSD were more strongly predictive of post-deployment symptoms and outcomes than concussion history.

Does blast vs. non-blast injury differ?

Lippa, Pastorek, Benge, and Thornton. (2010). *JINS*, 16, 856-866.

- ❑ Self-reported post-concussive symptoms in 339 Veterans
- ❑ Veterans with any blast-related mTBI history were younger and reported higher post-traumatic symptoms than Veterans with non-blast mTBI histories.
- ❑ Post-concussion symptoms did not vary by number of blast-related mTBIs or by proximity to blast.
- ❑ Overall post-traumatic stress symptoms accounted for a substantial portion of the variance in post-concussion symptoms.
- ❑ Mechanism of injury did not clearly contribute to differences in post-concussion symptoms.
- ❑ Authors conclude that proximal factors (e.g., substance use/abuse, mood disorder, etc.) may be important intervention targets.

Does blast vs. non-blast injury differ?

Luethcke, et al., (2011). *JINS*, 17, 36-45.

- ❑ Assessed concussive, psychological and cognitive symptoms in 82 military personnel and civilian contractors diagnosed with mTBI at CSH in Iraq.
- ❑ Results suggested there are few differences in concussive symptoms, psychological symptoms, and neurocognitive performance between blast and non-blast mTBI.

DVA Health Services Research & Development
Service QUERI, January 2013.

Complications of Mild Traumatic Brain Injury in
Veterans and Military Personnel: A Systematic
Review.

Full report available at:
[http://www.hsrd.research.va.gov/publications/esp/
mild_tbi.cfm](http://www.hsrd.research.va.gov/publications/esp/mild_tbi.cfm)

Literature search was conducted of Medline, psychINFO,
and Cochrane Register of Controlled Trials (OVID) for
observational studies, clinical trials, systematic reviews,
and cost studies, from database inception to October 3,
2012.

Search was limited to articles involving human subjects
and published in the English language.

Combat Concussion, cont.

QUERI: Summary of Findings:

- ▣ "In general, we found that, though cognitive, physical,
and mental health symptoms were frequently reported
by Veterans/military members following mTBI, there
was little evidence that symptoms were more common in
those with mTBI than those without mTBI."
- ▣ Therefore "suggesting that outcomes may be influenced
by other deployment-related conditions such as PTSD."

QUERI: CAVEAT

- ▣ Weakened evidence base due to inconsistent findings, methodology shortcomings, and variation in outcomes considered and in measurement approaches.

Summary of Outcomes

"...outcomes in patients with history of mTBI and PTSD depend on a complex constellation of factors, including but not limited to the recency of the injury event, the psychological context of the injury event, the severity of mTBI (as indexed by such factors as the duration of PTA, and the depth and duration of LOC), the severity and duration of PTSD symptoms, the presence of other somatic and psychiatric comorbidities, the potential for secondary gain, and a host of other biological, psychological, and contextual risk and resilience factors."

Vasterling & Dikmen (2012). Mild Traumatic Brain Injury and Posttraumatic Stress Disorder: Clinical and Conceptual Complexities. *JINS*, 18, 390-393

Multiple Concussions

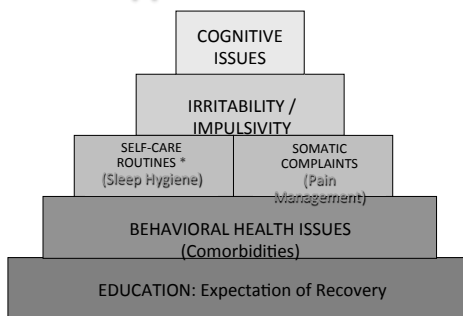
- ▣ VA/DoD Clinical Practice Guidelines advise:
The approach of symptom-based assessment and treatment of repeated concussion should be similar to the management of exposure to a single injury.
- ▣ Preliminary studies suggest:
Recurrent concussion *may* be associated with longer recovery time and persistent symptoms. (McCrea, 2008)

TREATMENT RECOMMENDATIONS FOR MTBI

Clinical Practice Guidelines: Management of Concussion/ mTBI

- ❑ VA/DoD Evidence Based Practice
- ❑ Published April 2009
- ❑ "Consensus document including definitions, classifications and taxonomy"

TBI stepped care model (terrio, 2009)



* Includes Sleep Hygiene, diet, exercise, and avoiding further TBI

Education: VA/DoD recommendations

- ▣ A critical aspect of intervention
- ▣ Helps manage expectations and prevents development of symptoms and/or reduce their duration, number, and severity.
- ▣ Education should occur at the time of the diagnosis (through printed materials and verbal review)
- ▣ Follow up education should take place as appropriate

Education: VA/DOD Recommendations

Education should consist of:

- ▣ Symptoms and expected outcome
- ▣ Normalizing symptoms
- ▣ Reassurance about expected positive recovery
- ▣ Techniques to manage stress

Components of Patient Education

- Provision of information about concussion/mTBI
- Strategies for prevention of further injury
- Education/normalization
- Awareness of limitation
- Self-monitoring of symptoms
- Contact information.

IMPACT OF CO- OCCURRING CONDITIONS

Co-Occuring Conditions

- ☐ Behavioral Health Issues
 - PTSD
 - Depression
 - Substance Use
- ☐ Somatic Complaints
 - Sleep disturbance
 - Pain
 - Headache
 - Dizziness and Balance
 - Visual Problems
 - Changes in Smell

Behavioral Health

“In patients with persistent post-concussive symptoms that have been refractory to treatment, consideration should be given to other factors including behavioral health (e.g stress disorders, mood disorders, substance use disorders), psychosocial support, and compensation/litigation”

- VA/DoD CPG

Behavioral Health: PTSD

- ▣ Estimates of prevalence of PTSD in OIF/OEF/OND veterans ranges from 13-25%.
- ▣ History of Concussion and PTSD often co-exist
- ▣ Post concussive symptoms have been shown to be predicted by pain and PTSD

Treatment: PTSD

- ▣ Evidence Based Treatments (EBTs) for PTSD: VA/DoD Clinical Practice Guidelines
- ▣ Significant Benefit Found:
 - Exposure Therapy
 - Cognitive Therapy
 - Eye Movement Desensitization and Reprocessing (EMDR)
 - Stress Inoculation Training (SIT)
- ▣ Some Benefit Found:
 - Image Rehearsal Therapy
 - Psychodynamic Therapy
 - Patient Education

Behavioral Health: Depression

- ▣ RAND study: 1/3 of those who had experienced TBI had co-occurring depression.
- ▣ Depression symptoms impact both subjective cognitive complaints and objective cognitive deficits.

Treatment: Depression

- ▣ EBT for Depression: VA/DoD Clinical Practice Guideline Recommendations
 - Cognitive Behavioral Therapy (CBT)
 - Interpersonal Therapy
 - Problem Solving Therapy
 - Medication

Behavioral Health: Substance Use

- ▣ Approximately 11% of OIF/OEF/OND veterans have been diagnosed with a substance use disorder
- ▣ Data from drug use (separate from alcohol use) is limited.
- ▣ Alcohol has a damaging effect on cognitive functioning
- ▣ Alcohol abuse may increase the burden associated with concussion and negatively affect recovery.

Somatic Complaints: Sleep

- ▣ Sleep disorders: common problem post-deployment, also associated with PTSD, pain, depression, and anxiety disorders
- ▣ Poor sleep is associated with deficits in attention, executive functioning, and memory

Treatment: Sleep

- ☐ Sleep Hygiene
 - Can be helpful
- ☐ Cognitive Behavioral Therapy for Insomnia (CBT-I)
 - Integrated behavioral and cognitive techniques
 - Numerous studies demonstrating it's efficacy
 - Evidence Based Therapy available in the VA system

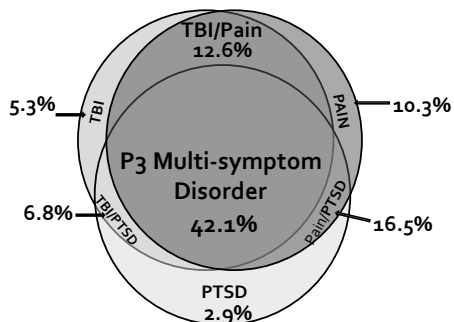
Somatic Complaints: Pain

- Pain: HA and MSK problems are common
 - Pain is the number one medical complaint in OIF/OEF veterans
 - 47% of OIF/OEF veterans report some level of current pain.
 - <50% of OIF/OEF/OND veterans enrolling in VA healthcare have diseases of the musculoskeletal system
- ☐ Patients with chronic pain often complain of forgetfulness, difficulty maintaining attentions, difficulty with concentration and thinking
- ☐ A number of studies have identified persistent pain as a significant predictor of poor outcome following concussion

Treatment: Pain

- ☐ Identify and treat/manage underlying disease/pathology
- ☐ Reduce the incidence and severity of pain
- ☐ Optimize individual's functioning/productivity
- ☐ Reduce suffering and emotional distress
- ☐ Improve overall quality of life

Co-morbid Concerns in Combat Veterans



Somatic Complaints: Post Traumatic Headaches

- ▣ Occur within 7 days of head trauma or after regaining consciousness
- ▣ Categorized as secondary headaches by International Classification of Headache Disorders
- ▣ >3 months considered chronic
- ▣ May be tension, migraine, whiplash-cervicogenic or a combination

Treatment: Post Traumatic Headaches

- ▣ Categorize headache type or types
- ▣ Treat migraine symptoms, tension, chronic daily headache, cervicogenic symptoms according to established guidelines for primary headaches

Somatic Complaints: Dizziness and Balance

- ▣ Common subjective complaints in returning veterans
- ▣ Objective data for balance and vestibular impairment often lacking
- ▣ True vertigo is rare in concussion
- ▣ Subjective complaints of disequilibrium are common and may represent sensory integration problems

Treatment: Dizziness and Balance

- ▣ Refer to ENT and Vestibular PT for true vertigo
- ▣ Consider differential of BPPV; Meniere's (Post Traumatic Hydrops); Perilymphatic Fistula, Vestibular Nerve Injury

Somatic Complaints: Visual Problems

- ▣ Common and may contribute to headaches
- ▣ Types of Dysfunction
 - Accommodative
 - Convergence
 - Oculomotor

Treatment: Visual Problems

- ▣ Refer to Optometry and give history of head injury events
- ▣ Possible recommendation for vision therapy
- ▣ OT might be involved in treatment

Somatic Complaints: Changes in Smell

- ▣ Common even in concussion (estimated at 25%)
- ▣ Not often noticed by patients
- ▣ Consider sinus disease and smoking in differential diagnosis of anosmia

Treatment: Changes in Smell

- ▣ Spicing foods
- ▣ Watch weight
- ▣ Reassurance

Cognitive Complaints

- ▣ Attention
- ▣ Concentration
- ▣ Focus
- ▣ Memory
- ▣ Learning
- ▣ Processing speed
- ▣ Planning
- ▣ Decision-making

Cognitive Issues: CPG

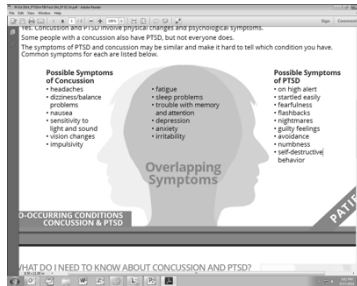
Clinical Practice Guidelines:

- ▣ “Although initial cognitive complaints and problems are common in the first hours and days after a concussion/mTBI, the vast majority of individuals recover within one to four weeks.”

Cognitive Issues: CPG

“However, a small minority either continue to report cognitive problems or report worsening symptoms over the months and even years post-injury. This subgroup frequently has premorbid or comorbid conditions such as depression, anxiety, poor health, and chronic pain or poor psychosocial support or other coping resources.”

Multifactorial Nature of Cognition



PRACTICAL SOLUTIONS

For Subjective Cognitive Complaints

“Cognition” refers to:

- Attention
- Memory
- Executive Function

VA/DoD Lifestyle Recommendations

- ▣ Exercise
- ▣ Healthy diet
- ▣ Sleep hygiene
- ▣ Stress reduction
- ▣ Relaxation training
- ▣ Leisure activities
- ▣ Pacing

Cognitive Strategy Training

- ▣ Psychologist, SLP, OT
- ▣ Functional approach to compensating for attention and memory difficulties
- ▣ 1:1 or in group/class setting
- ▣ Useful for people regardless of etiology of cognitive complaints

Cognitive Strategy Examples

- ▣ Environmental Management
- ▣ Time Management
- ▣ Goal Setting
- ▣ Attention Strategies
- ▣ Specific Memory Strategies

Direct Training

- ▣ There is some evidence to support use of direct training of attention
 - Brain games
 - Attention Process Training (APT)
 - Interactive Metronome (IM)
- ▣ Most effective is direct attention training alongside cognitive skill training
- ▣ No evidence to support direct training of memory
 - Focus on memory aids and strategies

Study Skills

- ▣ Environmental Management
- ▣ Organizational Skills
- ▣ Time Management and Routine
- ▣ Reading Comprehension
- ▣ Writing Organization
- ▣ Study and Memorization Strategies
- ▣ Test-Taking Strategies
- ▣ Assistive Technology

Assistive Technology for Cognition (ATC)

Clinical Practice Guidelines:

- ▣ "Assistive technology for cognition (ATC) refers to a subset of assistive technology used to compensate for cognitive impairments in memory, attention, and executive function. Devices in this category are also known as memory aids or cognitive prostheses. They are designed to assist individuals with concussion/mTBI to carry out everyday tasks by providing cues or limiting demands on impaired cognitive skills. Devices can range from simple electronic tools, such as a wrist watch with an alarm function to sophisticated personal digital assistants and global positioning systems. Successful longterm utilization of ATC by persons with concussion/mTBI requires selection of appropriate devices and effective training using the device in real-life contexts.

ATC Examples

- ☐ "Cognitive Prostheses"
- ☐ Dayplanners
- ☐ Watches
- ☐ Timers/Alarms
- ☐ Audio recorders
- ☐ GPS
- ☐ Smartphones
- ☐ Tablets
- ☐ Smartpens



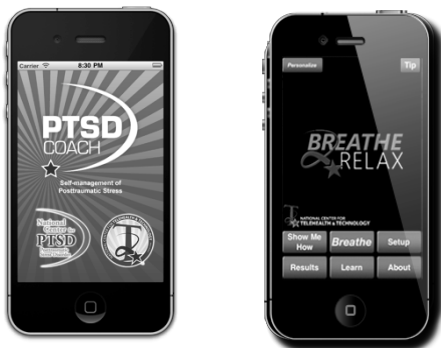




Applications

- PTSD Coach
- Care4Caregiver
- VA Pain Coach
- Rx Refill
- PE Coach
- CBT-I Coach
- Breathe2Relax
- T2 Mood Tracker
- Concussion Coach

Mobile Applications



When to Refer

Refer When.....

- ▣ Patient has sustained a moderate/severe TBI
- ▣ Patient is having persistent symptoms despite treatment of other co morbid conditions
- ▣ Persistent problems with balance, vision, or intractable headaches
- ▣ Further clarification is needed

Referrals to Consider

- ▣ MD
- ▣ Mental Health
- ▣ OT
- ▣ PT
- ▣ SLP
- ▣ SW
- ▣ Specialists: audiology, optometry/vision, sleep, neuropsychology, pain clinics
- ▣ VA Polytrauma Clinic

POLYTRAUMA SYSTEM OF CARE: OVERVIEW

Polytrauma System of Care



Polytrauma Definition

"Polytrauma is defined as injury to the brain in addition to other body parts or systems resulting in physical, cognitive and functional disability. Injury to the brain is the impairment which guides the course of rehabilitation."

**VHA 2005-24 Directive
definition**

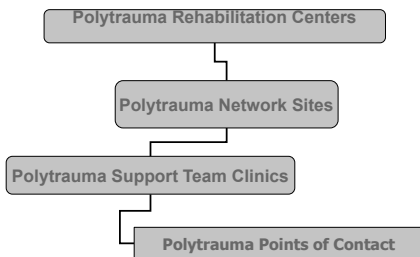
Polytrauma Rehabilitation's Role

- To care for patients with these diverse and serious injuries requiring more than one type of therapy (physical/occupational/speech)
- Interdisciplinary care approach with ongoing follow up

Polytraumatic injuries

Traumatic Brain Injury (TBI)
Hearing Loss
Amputations
Fractures
Burns
Visual Impairment

Geographic organization



Polytrauma Support Clinic Teams



- ▣ Outpatient rehabilitation services closer to home- wide distribution across US
- ▣ Able to care for lifelong impairments with ongoing follow up and family support
- ▣ Multidisciplinary rehabilitation team approach

PVAMC Polytrauma Team

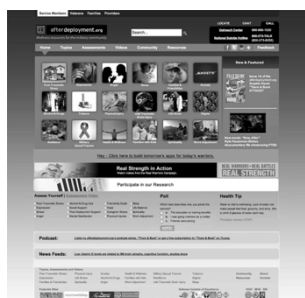
- Andrea Karl, MD - Director of Clinic
- Katherine Noonan, Ph.D.- Psychologist
- Ellen Kessi- Social Work Case Manager
- Rachael Cushing - Nurse Case Manager
- Shiny Vergis - Physical Therapist
- Kathleen Zabrocki - Occupational Therapist
- Joanna Close - Speech-Language Pathologist

ADDITIONAL RESOURCES

Resources/Information

- ❑ Afterdeployment.org
- ❑ Military One Source (militaryonesource.com)
- ❑ National Center for PTSD (ptsd.va.gov)
- ❑ Defense and Veterans Brain Injury Center (DVBIC.org)
- ❑ Defense Centers of Excellence (dcoe.health.mil)
- ❑ Veterans Crisis Hotline 1-800-273-TALK (8255)

AFTERDEPLOYMENT.ORG





VSIN 19 MIRECC – The Rocky Mountain Network

Introducing:

An Online Toolkit for Providers of Clients with Co-occurring TBI and Mental Health Symptoms

Many Veterans seek care in community-based healthcare organizations other than the Veterans Health Administration (VHA). This [toolkit](#) is designed to offer community providers with information and tools to meet the needs of returning Veterans experiencing co-occurring disorders. Created in close collaboration with local community mental health clinicians, the online resource is organized as follows:

[Military/Veteran Culture, Traumatic Brain Injury, Co-occurring Mental Health Disorders, and Resources](#)

The toolkit also contains best practices identified at an expert consensus meeting published in the *Community Mental Health Journal* (2013) by Drs. Olson-Madden, Brenner, Metarazzo, and Signoracci, along with Expert Consensus Collaborators.

<http://www.mirecc.va.gov/vsin19/>

QUESTIONS?
