

# Deployment-related PTSD and Mild TBI in Service Members



March 24, 2016; 1-2:30 p.m. (ET)

## Presenter:

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***"Medically Ready Force...Ready Medical Force"***

# Webinar Details



- Live closed captioning is available through Federal Relay Conference Captioning (see the “Closed Captioning” box)
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  - Dial: CONUS **888-455-0936**
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  - Use participant pass code: **1825070**
- Question-and-answer (Q&A) session
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# Resources Available for Download



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A screenshot of an Adobe Connect webinar interface. The main window displays a slide titled "State of the Science: Clinical, Metabolic and Pathologic Effects of Multiple Concussions" for a January 16, 2014 webinar. The slide also lists the moderator, Donald Marion, M.D., M.Sc., and his affiliation with the Defense and Veterans Brain Injury Center. In the bottom-left corner, a "Files for Download" panel is visible, containing a table of files. This panel is circled in red. The table lists three files: "Back to School Guide to Academic Suc" (1 MB), "Neuroimaging Following mTBI Clinical" (353 KB), and "Neuroendocrine Dysregulation Screens" (266 KB). Below the table is a "Save To My Computer" button. Other interface elements include a "Q &amp; A" panel, a "Public Chat" panel, and a "Closed Captioning" panel.

# Continuing Education Details



- DCoE's awarding of continuing education (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



- 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 AAPA Category 1 CME credit

# Continuing Education Accreditation



## **Physicians**

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Professional Education Services Group and the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCOE). Professional Education Services Group is accredited by the ACCME to provide 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**

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## **Psychologists**

This activity 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.

# Continuing Education Accreditation



## **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.

## **Rehabilitation Counselors**

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

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# Continuing Education Accreditation



## **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 is offered for 1.5 contact hours (which includes 0 hours of pharmacology).

## **Physician Assistants**

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## **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.



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- 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 (mild TBI) or concussion has been identified as a hallmark injury of the Afghanistan and Iraq wars. This review addresses the impact of mild TBI on the development, course and clinical management of PTSD. Research efforts take into consideration the potential differential impact of PTSD and mild TBI with or without persistent cognitive deficits. Findings have shown the impact of mild TBI on response to existing PTSD treatment interventions, and development and examination of potential treatment augmentation strategies.

Understanding the epidemiology, diagnostic evaluation and clinical management of common physical symptoms can benefit both physical and psychological health. The goal of this webinar is to share current research and treatment practices related to post-deployment PTSD symptoms, including those attributed to mild TBI.

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

- Identify potential mechanisms underlying high rates of comorbidity of deployment-related PTSD and mild TBI.
- Recognize challenges in differentiating the etiology of overlapping symptoms.
- Apply treatment considerations when PTSD manifests in patients with a history of deployment-related mild TBI.

# Jennifer J. Vasterling, Ph.D.



Jennifer J. Vasterling, Ph.D.

- Chief of psychology at VA Boston Healthcare System and professor of psychiatry at Boston University School of Medicine
- An affiliated investigator of the Behavioral Science Division of the VA National Center for PTSD
- Trained as a clinical neuropsychologist, research has centered on the neurocognitive and emotional changes that accompany war-zone deployment
- Edited several books, the most recent of which addresses co-morbid PTSD and mild traumatic brain injury
- Awarded the 2009 Distinguished Scientific contributions Award by Division 56 (Trauma Psychology) of the American Psychological Association
- Served on a number of journal editorial boards and as a consultant to the Institute of Medicine
- Currently serves as president of the Society for Clinical Neuropsychology (Division 40 of the American Psychological Association)
- **Education**
  - Post- Doctoral Fellowship, Boston VAMC, Clinical Neuropsychology
  - Ph.D. from Vanderbilt University, Psychology
  - B.S. from Louisiana State University, Psychology

# Deployment-related PTSD and Mild TBI in Service Members

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# Disclosure



- Dr. Vasterling has no relevant financial relationships to disclose.
- The views expressed in this presentation are those of the authors and do not necessarily reflect the official policy or position of the Department of Defense, Department of the Veterans Affairs nor the U.S. Government.
- The description of programs in this presentation is for descriptive purposes only and not intended to promote any individual program.

# Overview

- Clarifications
- Epidemiology
- Mechanisms leading to comorbidity
- Clinical implications: assessment
- Clinical implications: treatment

# Clarifications

# TBI

TBI vs. On-going PCS

Blast Exposure vs. Blast TBI

Blast TBI vs. Deployment TBI



# TBI v. Postconcussive Symptoms

TBI = pathophysiological injury

PCS = expression of symptoms following mild TBI

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Post-mTBI:

Clinical presentation:

0-72 hrs

Symptoms at worst

1-3 months

Symptoms resolve

3 months

Full recovery

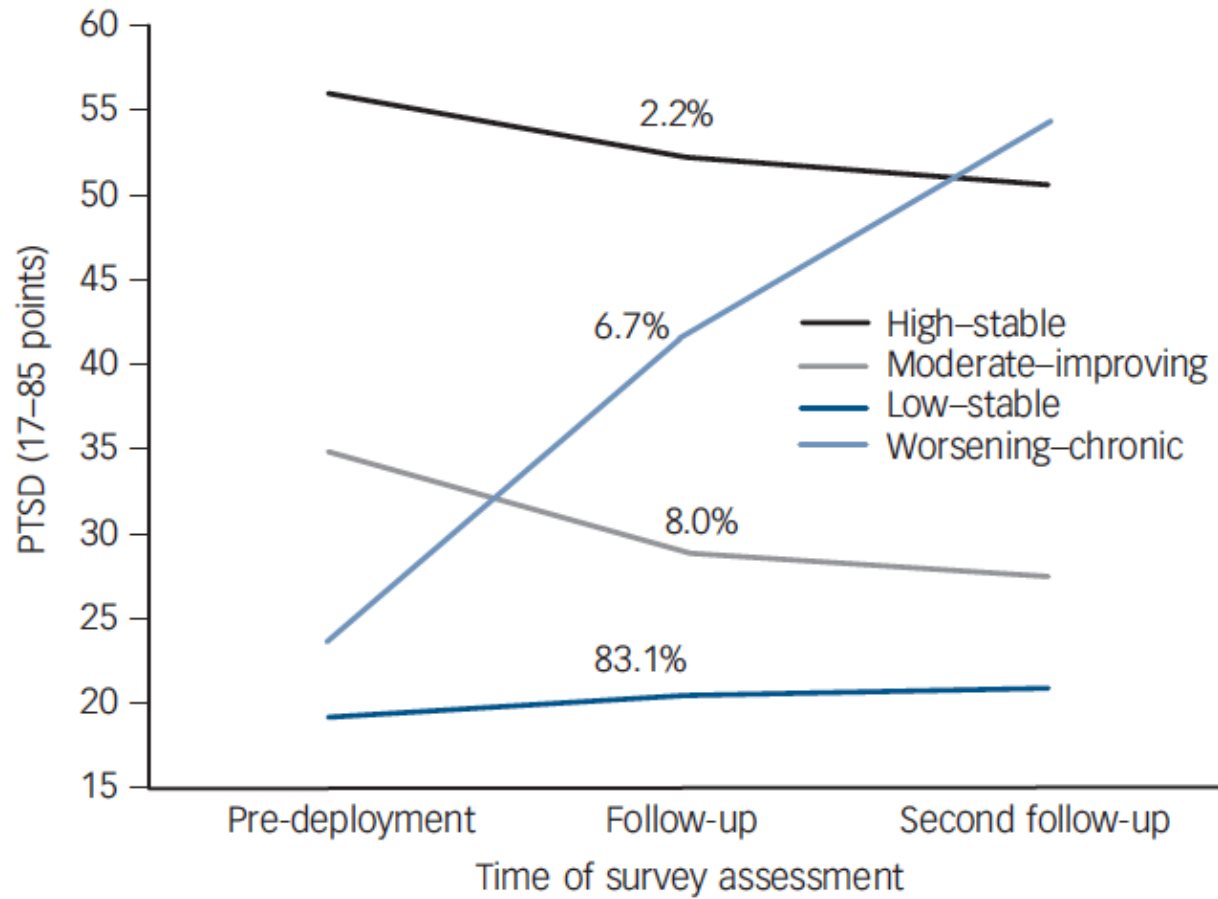
# PTSD

Stress vs. Trauma

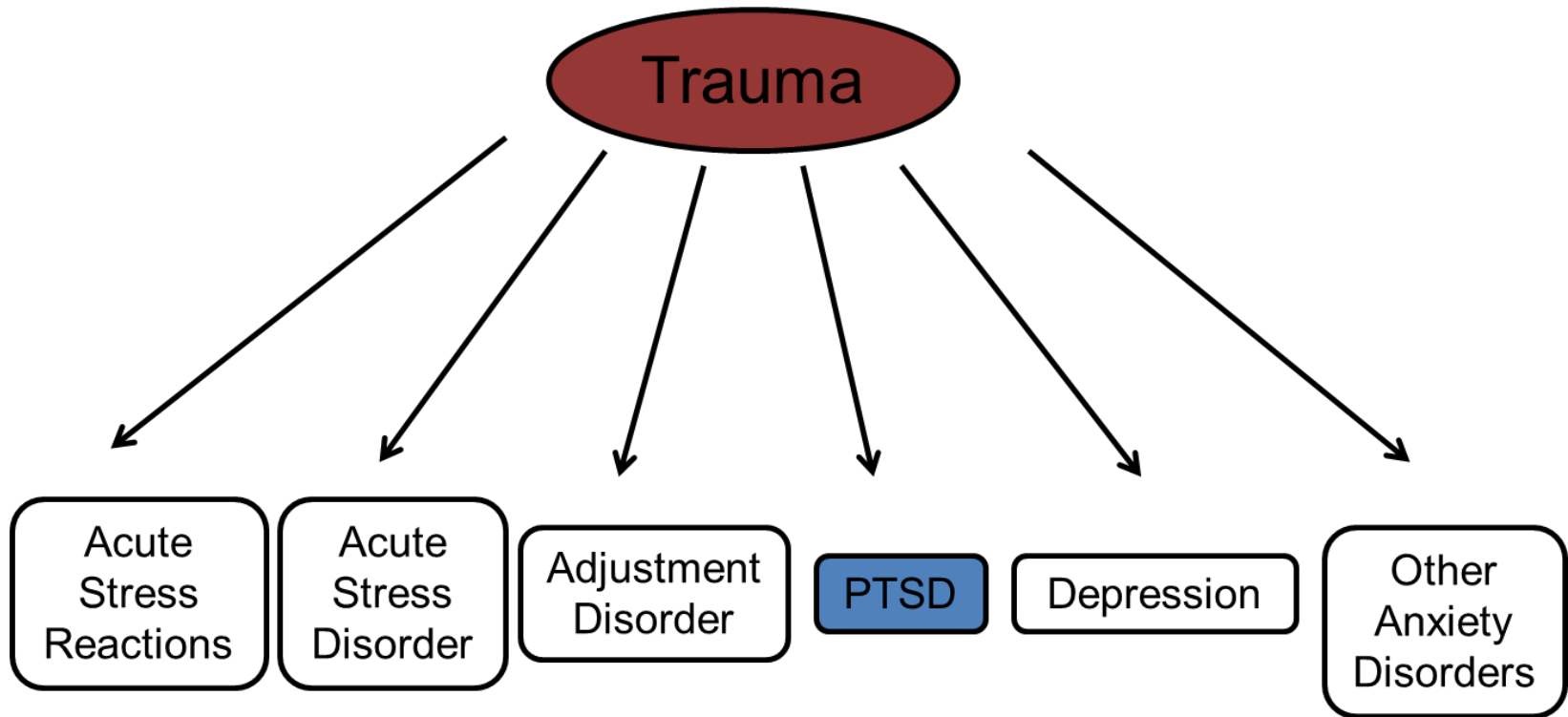
Exposure vs. PTSD

Acute vs. Chronic

# One Size Doesn't Fit All



# Spectrum of Psychological Trauma Reactions



# **Epidemiology**

# DoD Traumatic Brain Injury Data



## DoD Numbers for Traumatic Brain Injury Worldwide – Totals

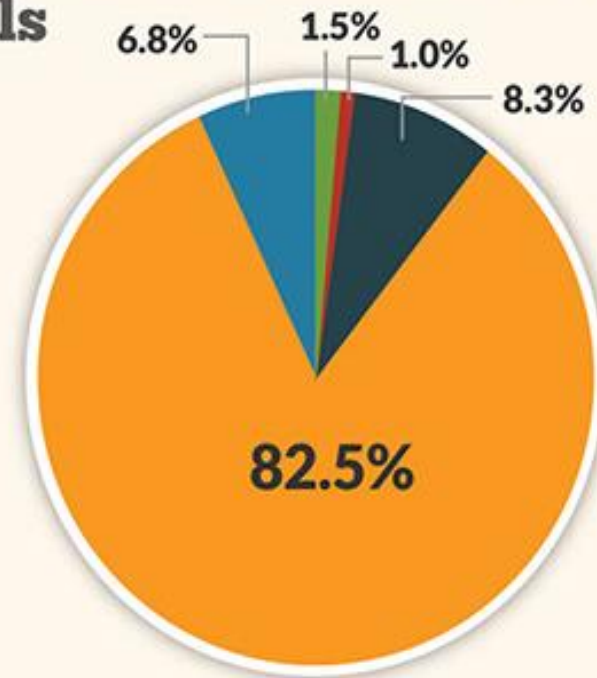
2000-2014 (Q1 - Q3)

Penetrating	4,577
Severe	3,126
Moderate	25,953
Mild	258,816
Not Classifiable	21,344

**Total - All Severities 313,816**

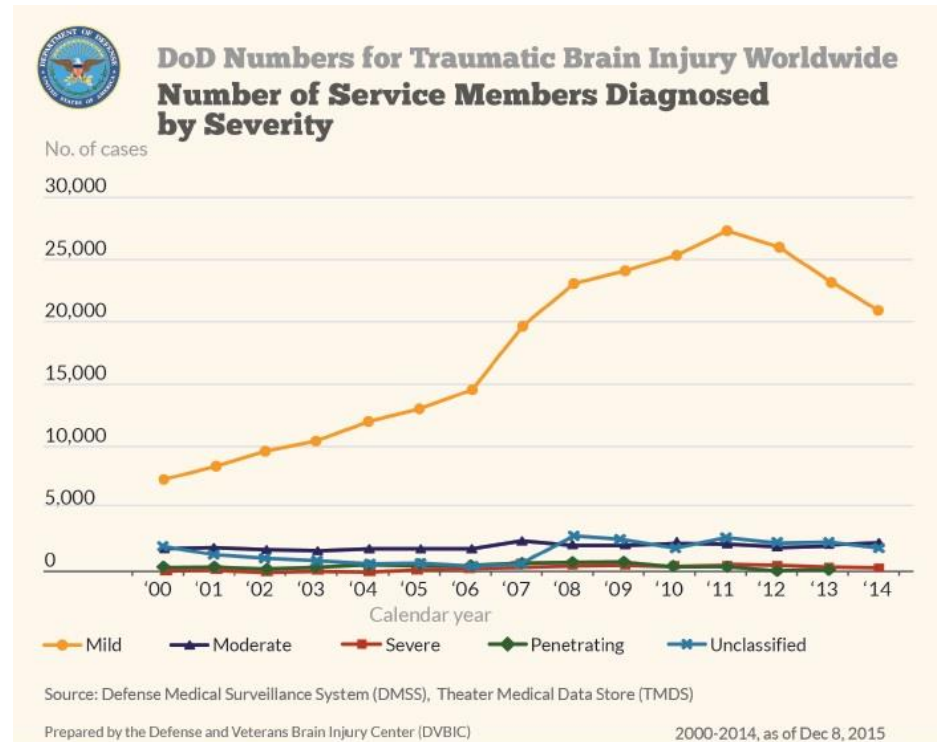
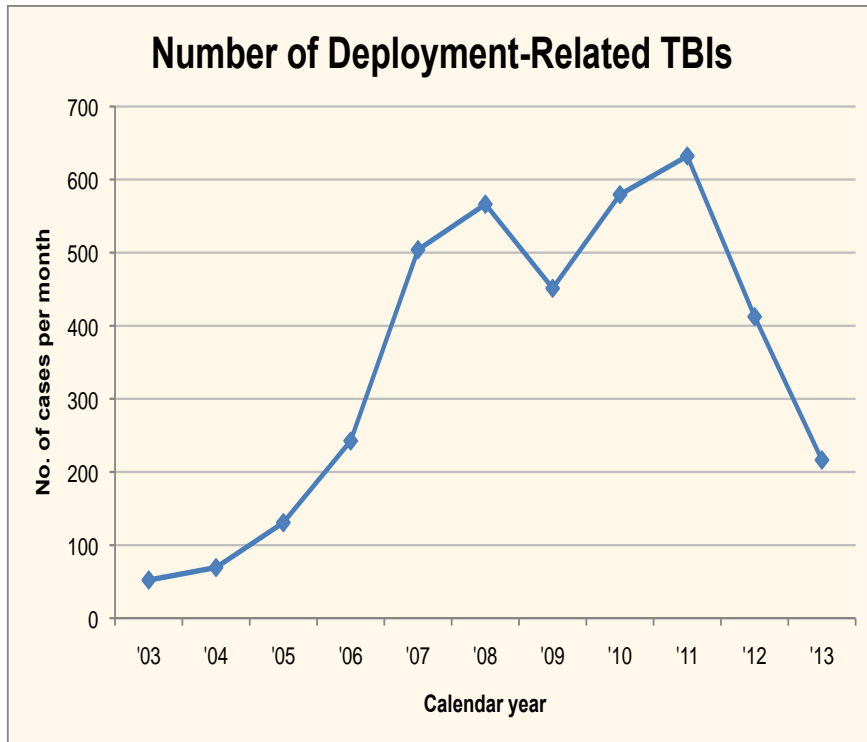
Source: Defense Medical Surveillance System (DMSS), Theater Medical Data Store (TMDS) provided by the Armed Forces Health Surveillance Center (AFHSC)

Prepared by the Defense and Veterans Brain Injury Center (DVBIC)  
Percentages do not add up to 100% due to rounding



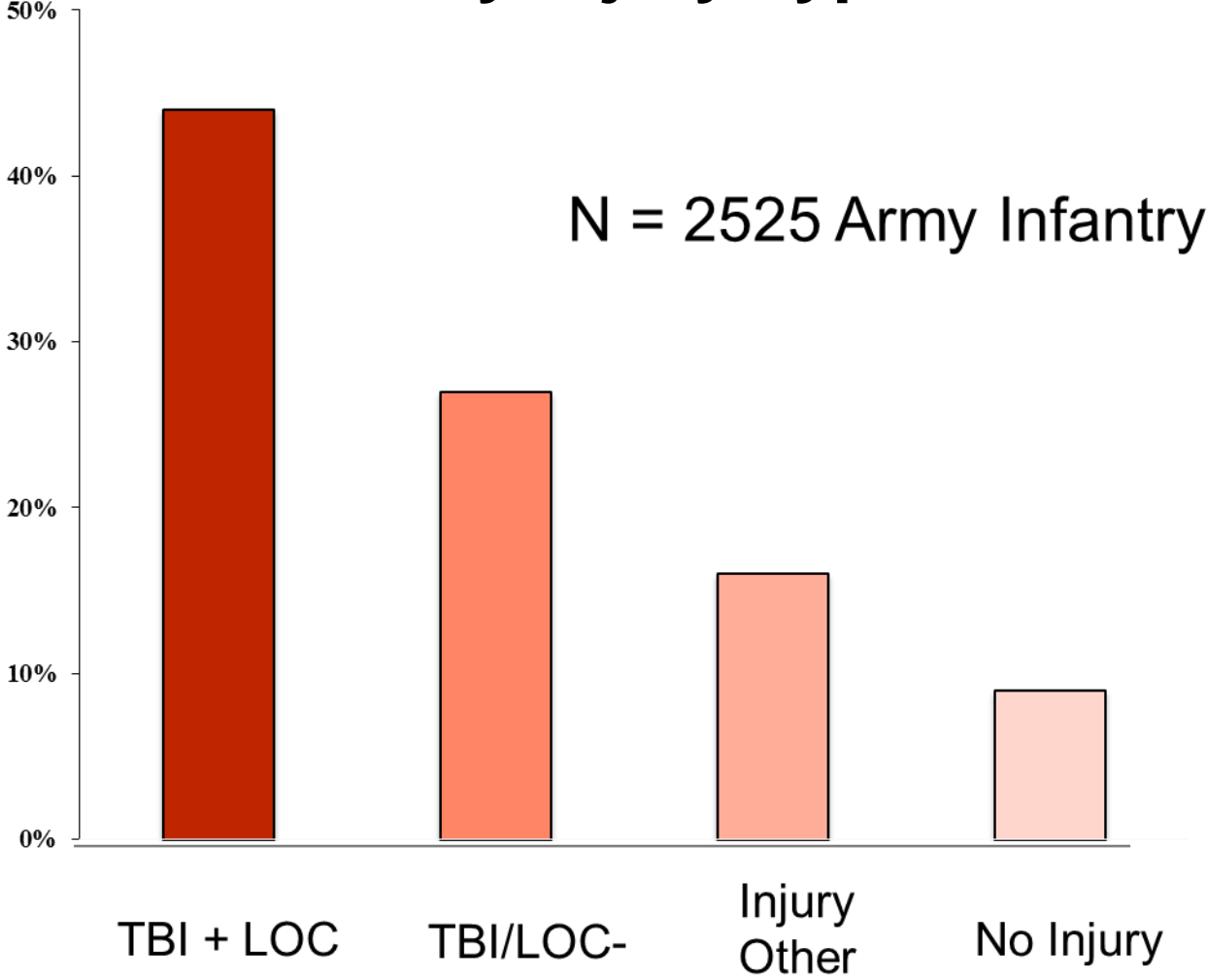
2000-2014 (Q1 - Q3), as of Dec 1, 2014

# Deployment TBI ty Year



# PTSD by Injury Type

PTSD





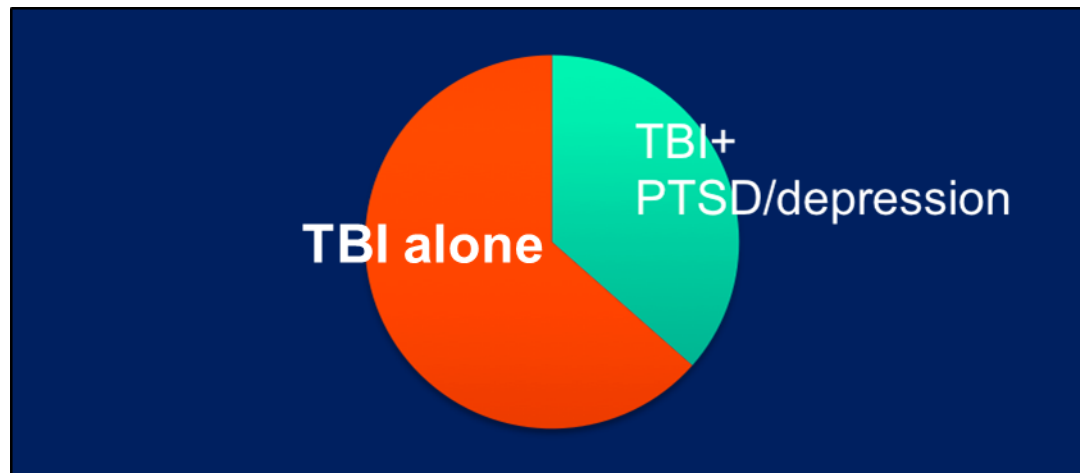
# PTSD: Scope of the Problem

- >2.7 million U.S. service members deployed since 9/11
- By 2015, >128,000 new DoD cases of PTSD in OEF/OIF deployed service members
- 10-18% report PTSD (range: 0-68%)
- Cost estimates PTSD and depression (1<sup>st</sup> 2 years): \$6.2 billion

# Comorbid TBI and PTSD: Military Epidemiology

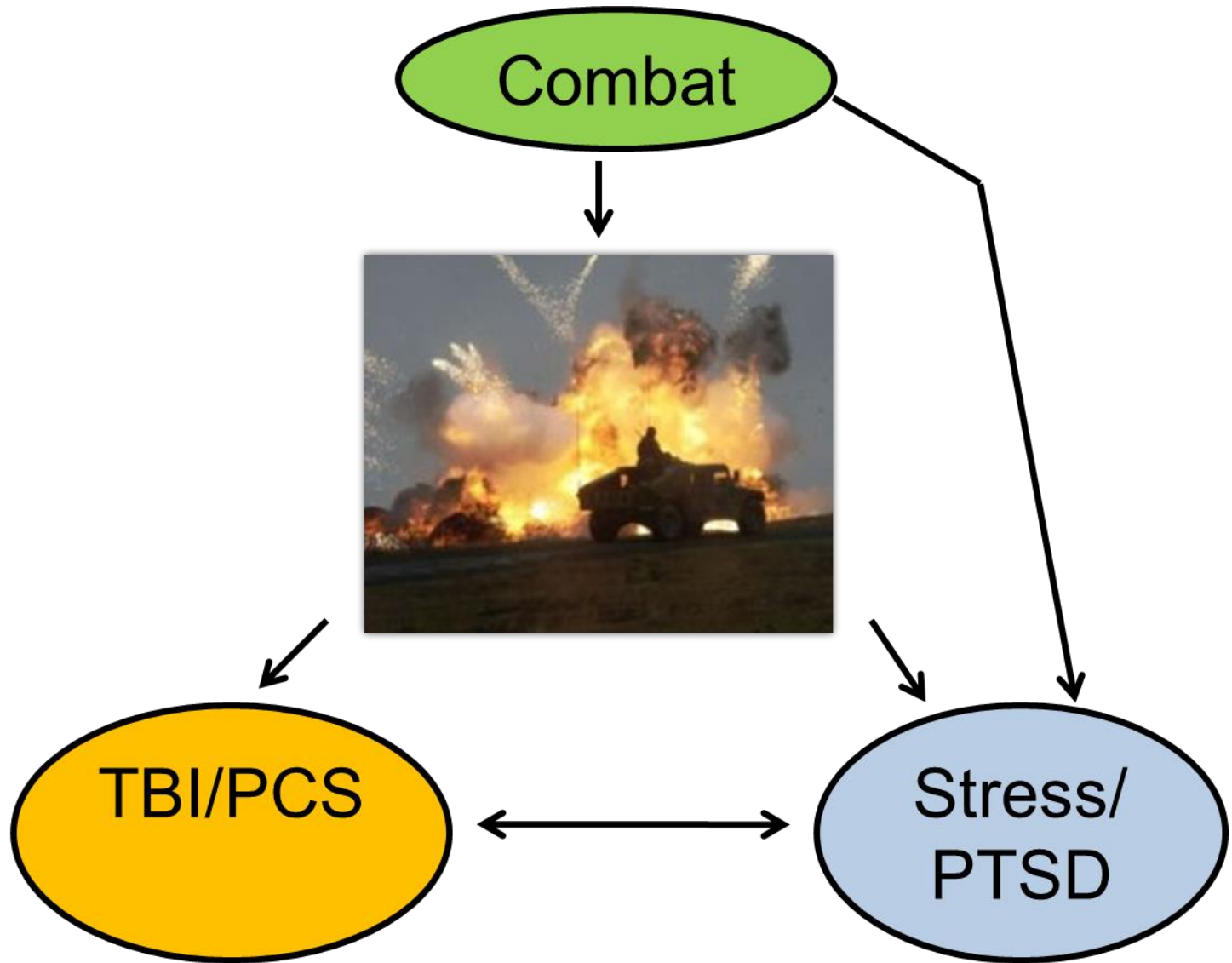
- Tanielian & Jaycox (2008):

Probability sample, weighted for potential selection biases



~ 19.5% reported TBI

# **Co-morbidity: Potential Mechanisms**



# Does TBI Increase Risk of PTSD?

- n = 1084 civilians with traumatic injuries

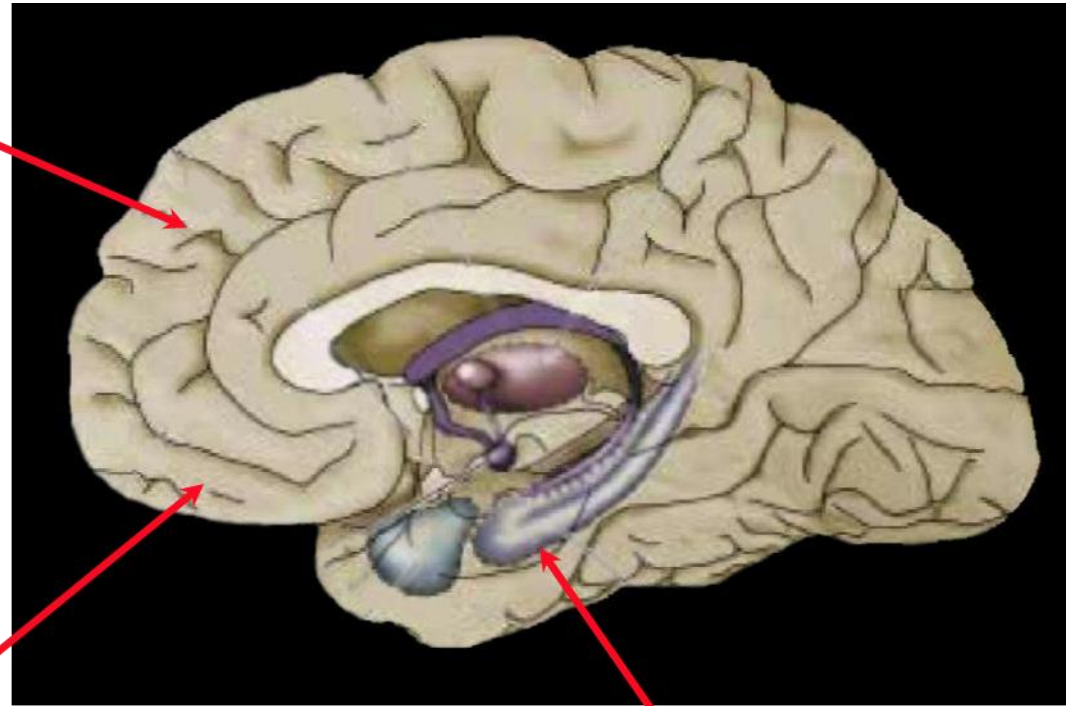
At 12 mos., mild TBI patients ~2x more likely to develop new:

	Adj OR	CI
PTSD	1.92	1.08, 3.40
Panic	2.10	1.03, 4.14
Social Phobia	2.07	1.03, 4.16
Agoraphobia	1.94	1.13, 3.39

Functional impairment related to psychiatric status.

# How does TBI impede emotional recovery?

Dorsolateral Frontal Cortex



Orbital Frontal Cortex

Hippocampus

# Possible Neurocognitive Mechanisms

- Altered **memory formation** for the event and associated emotions, leading to **poorly controlled recall of the event** (i.e., re-experiencing symptoms)
- Changes in **cognitive control** may lead to **emotional dysregulation**.

# Memory for Blast Events

N = 75 blast exposed veterans (50 TBI; 25 no-TBI)

Autobiographical narratives of blast event

Analyses adjusted for combat severity and PTSD severity

- 
- Coherence: TBI < no-TBI
  - Episodic details: TBI > no-TBI



# Does Emotional Distress Impede Recovery from Mild TBI?

Ponsford et al., *Neuropsychology*, 2012

n = 123 mild TBI; n = 100 no-TBI trauma

<u>Predictors</u>	<u>PCS 1 week</u>	<u>PCS 3 mo.</u>
TBI	+	--
PTA duration	--	--
1 wk cognitive performance	--	--
3 mo cognitive performance	n/a	--
Pre-injury psych hx	+	+
1 week anxiety sx	+	+
3 month anxiety sx	n/a	+
3 month PTSD sx	n/a	+

# Longitudinal Outcomes of Blast Concussion

- N = 38 blast concussion; N = 34 controls
- Time 1: 0-7 days post injury; Time 2: 6-12 months later
- Using ROC, best fit for predicting 6-12 month

TBI outcome (Glasgow Coma Scale-Extended) included:

Depression, PTSD, combat severity, and age

**How does emotional  
distress impede  
recovery from TBI?**

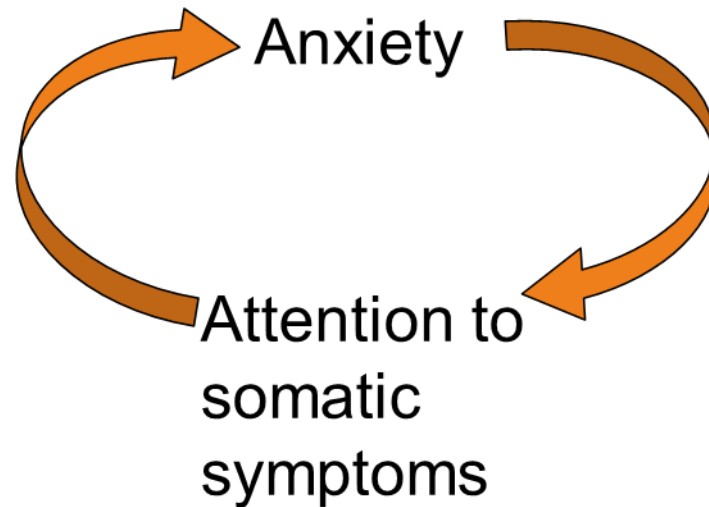
# Resilience

- Psychiatric status can affect resilience

**Resilience** - “adaptive coping, optimism and positive emotion, cognitive re-appraisal, positive reframing and acceptance, social competence and support, purpose in life” (Iverson)

# Somatic Pre-Occupation

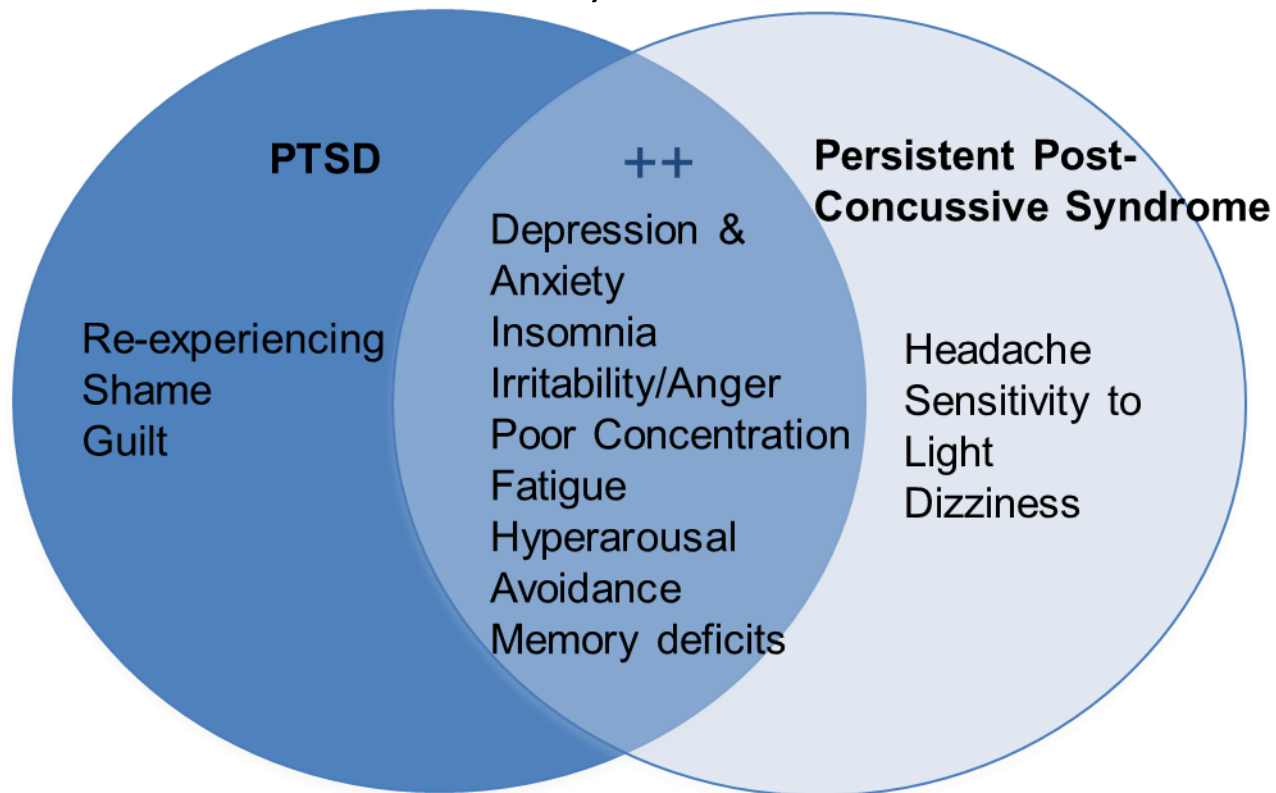
- Increased somatic pre-occupation  
(especially for anxiety disorders)



# **Clinical Implications: Assessment**

# Overlapping Symptoms

Overlap with co-morbidities (and the psychometric scales that measure them)



# Predictors of Cognitive Decline Over Deployment

Iraq

Baseline  
assessment

Post-deployment  
assessment

N = 760 Army Soldiers  
(n = 68 TBI-D+; n= 692 no TBI-D)



Photo courtesy of: Jennifer Vasterling



# Study Findings

- TBI: decrements in:
  - health related functioning
- PTSD: decrements in:
  - neuropsych performance
  - cognitive functioning
  - health related functioning
- TBI x PTSD: no significant interactions
- TBI attributes/prior TBI: not associated with outcomes

# Threats to Diagnostic Validity

- Symptoms:

Attributional errors (e.g., “good old days”)

Measurement overlap

Contextual influences on reporting/performance

- Event reporting:

Lack of witness reports

Chaotic event environments

Autobiographical recall biases and deficits



[www.theodoresworld.net](http://www.theodoresworld.net)

# TBI Recall Stability

- N = 400 soldiers from NDHS cohort
- Screened for TBI during index deployment twice:  
Time 1: post-deployment  
Time 2: 5-7 years later
- Results:  
Kappa = 0.53  
Post-deployment PTSD → Discordance ( $p < .0001$ )

# **Clinical Implications: Treatment**

# When is Etiology of Symptoms Less Important?

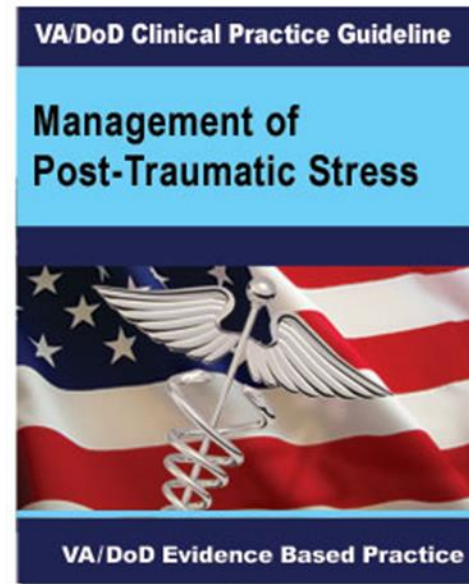
- Treatment of cognitive deficits and non-specific symptoms via cognitive rehab and psychoeducation
- Examples:
  - CogSMART (Twamley et al., JRRD, 2014)
  - Cognitive Strategy Training (Huckans et al., JRRD, 2010)

# Clinical Implications: When Does Etiology of Symptoms Matter?

- Treatment of PTSD



Illustration by Chris Gash



- Psychoeducation for TBI

# **Psychosocial Interventions for PTSD and Related Disorders**

# Cognitive Behavioral Therapy (CBT) for PTSD and Related Disorders

## Cognitive components

Target distorted, maladaptive thoughts with the goal of reappraisal to allow more effective responses

## Exposure:

Exposure to trauma reminders and the trauma memory in a safe context with the goal of modifying the memory to form new emotional associations



# Co-morbid TBI: Can I Treat PTSD and Related Disorders as Usual?

- Does TBI contraindicate PTSD treatment?
- Are standard evidence-based treatments for stress-related disorders effective when there is a TBI?
- Does TBI attenuate treatment response?
- Should interventions be modified or augmented when there is history of TBI?

# Does TBI contraindicate PTSD interventions?

No

- CBT interventions, including prolonged exposure, have been applied across mild, moderate, and severe TBI for PTSD

*Sripada et al., 2013; Walter et al., 2014; Wolf et al., 2012; Wolfe et al., 2015*

- Only a single case report of TBI with severe dysexecutive syndrome noted problems with exposure-based treatment

*King (2002)*

# Is CBT effective following mild TBI?

- CBT for acute stress symptoms after mild TBI reduces risk of subsequent PTSD

*Bryant et al., 2003*

- CBT has been effectively applied to a range of post-concussive symptoms (e.g, insomnia, social anxiety)

*Hodgson et al., 2005; Mittenberg et al., 1996; Ouellet & Morin, 2007*

- Both cognitive processing therapy and prolonged exposure effective for treatment of PTSD following TBI

*Sripada et al., 2013; Walter et al., 2014; Wolf et al., 2012; Wolfe et al., 2015*

# Does TBI attenuate treatment response?

- Mild TBI had no significant effect on response (PTSD symptom reduction) to PE in 51 Veterans receiving PE in a VA PTSD clinic or in 22 Veterans participating in an RCT of PE v. present centered therapy.

*Sripada et al., 2013*

- No significant difference in treatment adherence to CPT for combat-related PTSD, as a function of mild TBI.

*Davis et al., 2013*

- Treatment gains in for PE were actually larger in Veterans with moderate to severe TBI, as compared with mild TBI.

*Wolfe et al., 2015*

# Should interventions be “modified” or augmented?

- “Modification”
  - e.g., reminders, slower progression of session content
- Augmentation
  - e.g., cognitive rehabilitation, psychoeducation,  
intensive inpatient settings
- On-going clinical trial: CogSmart + Cognitive Processing Therapy for treatment of co-morbid PTSD and TBI (PI: A. Jak)

# Inpatient Rehabilitation as an augmentation to Prolonged Exposure

Predictor Variables	PTSD PCL-C
ITT Effect Sizes	d = 1.46
Tampa v. Durham	1.77%
TBI Severity	0.30%
Inpatient v. Outpatient	0.49%
Staff v. Trainee	4.71%*
Completed PE Tx	15.29%**

# PTSD Treatments: Beyond PTSD Symptoms

- CBT for PTSD may improve cognitive performance and alter functional activation on fMRI

(Roy et al., 2010; Thomaes et al., 2012)

- Preliminary multi-site findings suggest that PE addresses post-concussive symptoms and functioning, in addition to PTSD symptoms

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# QUESTIONS?

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For more information about PTSD:

<http://www.ptsd.va.gov>

THANK YOU!

# Questions

- Submit questions via the Q&A box located on the screen.
- The Q&A box is monitored and questions will be forwarded to our presenters for response.
- We will respond to as many questions as time permits.



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- Or send comments to [usarmy.ncr.medcom-usamrmc-dcoe.mbx.dcoe-monthly@mail.mil](mailto:usarmy.ncr.medcom-usamrmc-dcoe.mbx.dcoe-monthly@mail.mil)

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# Save the Dates



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## Next DCoE Traumatic Brain Injury Webinar:

**Management of Headache Following Concussion/Mild Traumatic Brain Injury: Guidance for Primary Care Management in Deployed and Non-Deployed Settings**

**April 14, 2016; 1-2:30 p.m. (ET)**

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## Next DCoE Psychological Health Webinar Theme:

**Prevention of Sexual Assault in Children**

**April 28, 2016; 1-2:30 p.m. (ET)**

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# Save the Date



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## 2016 Summit Call for Abstracts:

The Summit's Call for Abstracts is now open. Please submit your abstract by April 11<sup>th</sup> at <http://dcoe.am.pesgce.com/>.

Summit registration and continuing education information will be available soon.

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**2016 Summit State of the Science: Advantages in Diagnostics and Treatments of Psychological Health and Traumatic Brain Injury in Military Health Care**

**September 13 – 15, 2016**

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# DCoE Contact Info



**DCoE Outreach Center**  
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