

Communication Disorders in OEF/OIF Veterans with Traumatic Brain Injury: Diagnosis and Rehabilitation

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Objectives

- A review of military TBI
- Impact of co-morbid conditions and aging
- Strategies for improving communication

What is your primary role in the VA?

1. Clinician
2. Researcher
3. Manager, Administrator, Policy-maker
4. Student, trainee, fellow
5. Other

VA/DoD Definition of TBI

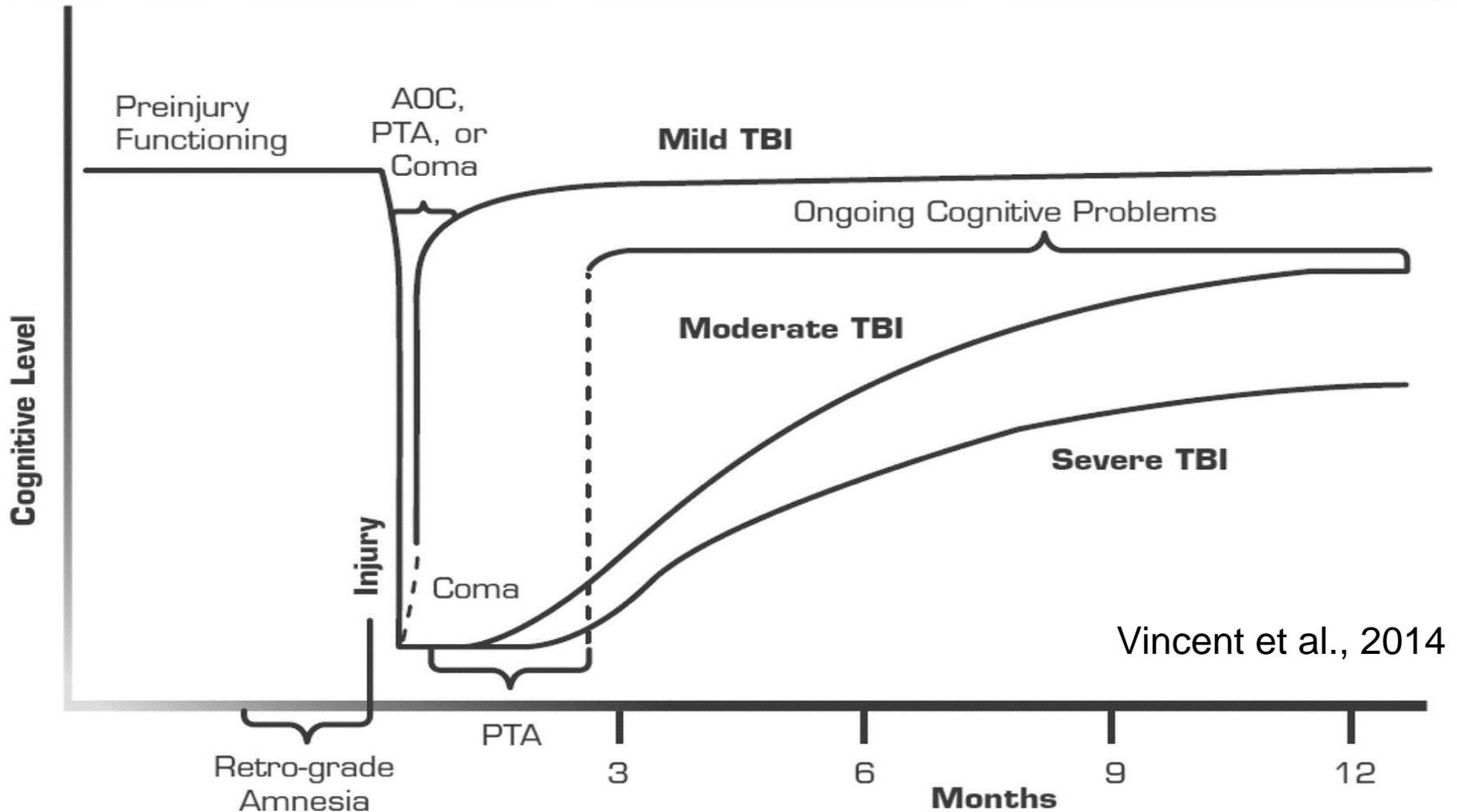
A traumatically induced structural injury and/or physiological disruption of brain function as a result of an external force that is indicated by **new onset or worsening of at least one** of the following clinical signs, immediately following the event:

- Any period of loss of or a decreased level of consciousness (LOC)
- Any loss of memory for events immediately before or after the injury (post-traumatic amnesia)
- Any alteration in mental state at the time of the injury (confusion, disorientation, slowed thinking, etc.) (Alteration of consciousness/mental state)
- Neurological deficits (weakness, loss of balance, change in vision, praxis, paresis/plegia, sensory loss, aphasia, etc.) that may or may not be transient
- Intracranial lesion

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 hours	> 24 hours
Alteration of Consciousness (AOC)	a moment up to 24 hrs.	>24 hours severity based on other conditions	>24 hours severity based on other conditions
Post-traumatic Amnesia	0-1 day	>1 and < 7 days	> 7 days
Glascow Coma Scale	13-15	9-12	< 9

Typical Recovery Pattern from TBI



TBI and Military

- 22% of all combat injuries from OIF/OEF/OND conflicts are brain injuries
- The primary causes of TBI in OEF/OIF Veterans are blasts, blast related motor vehicle accidents, MVAs, and gunshot wounds.
- People with previous brain injuries may find that it takes longer to recover from their current injury.



DoD Numbers for Traumatic Brain Injury Worldwide – Totals

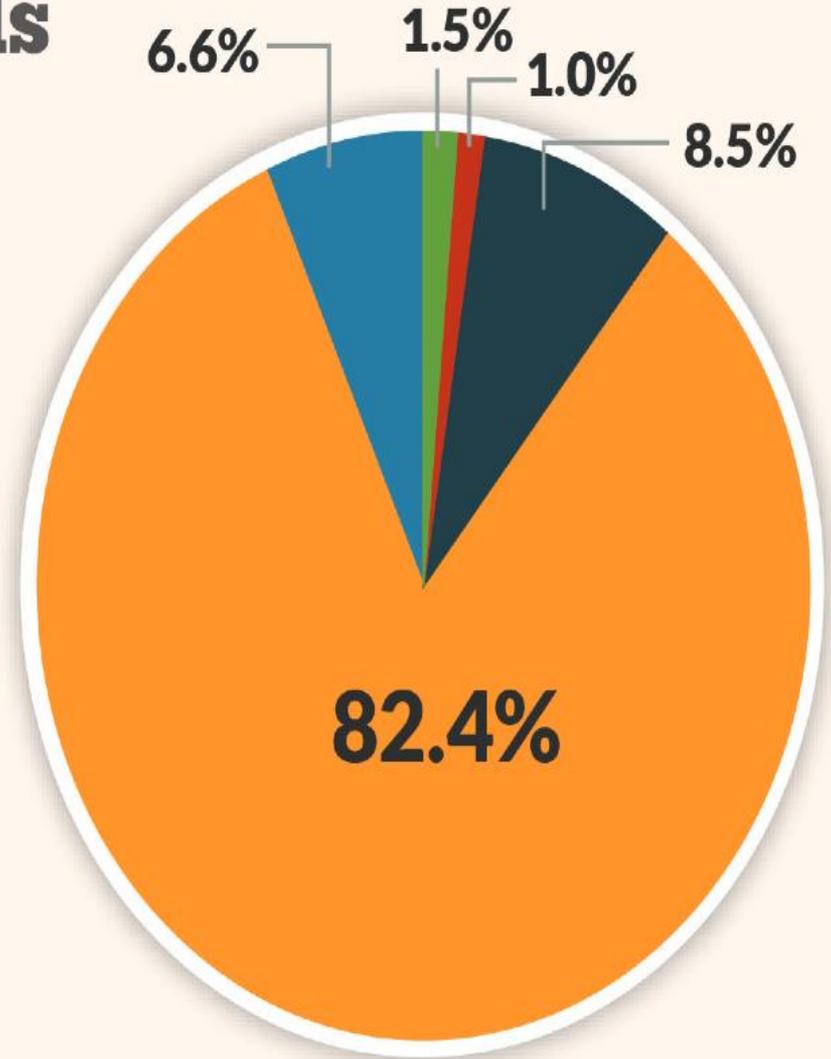
2000-2015 Q1

Penetrating	4,865
Severe	3,422
Moderate	27,728
Mild	269,580
Not Classifiable	21,704

Total - All Severities **327,299**

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

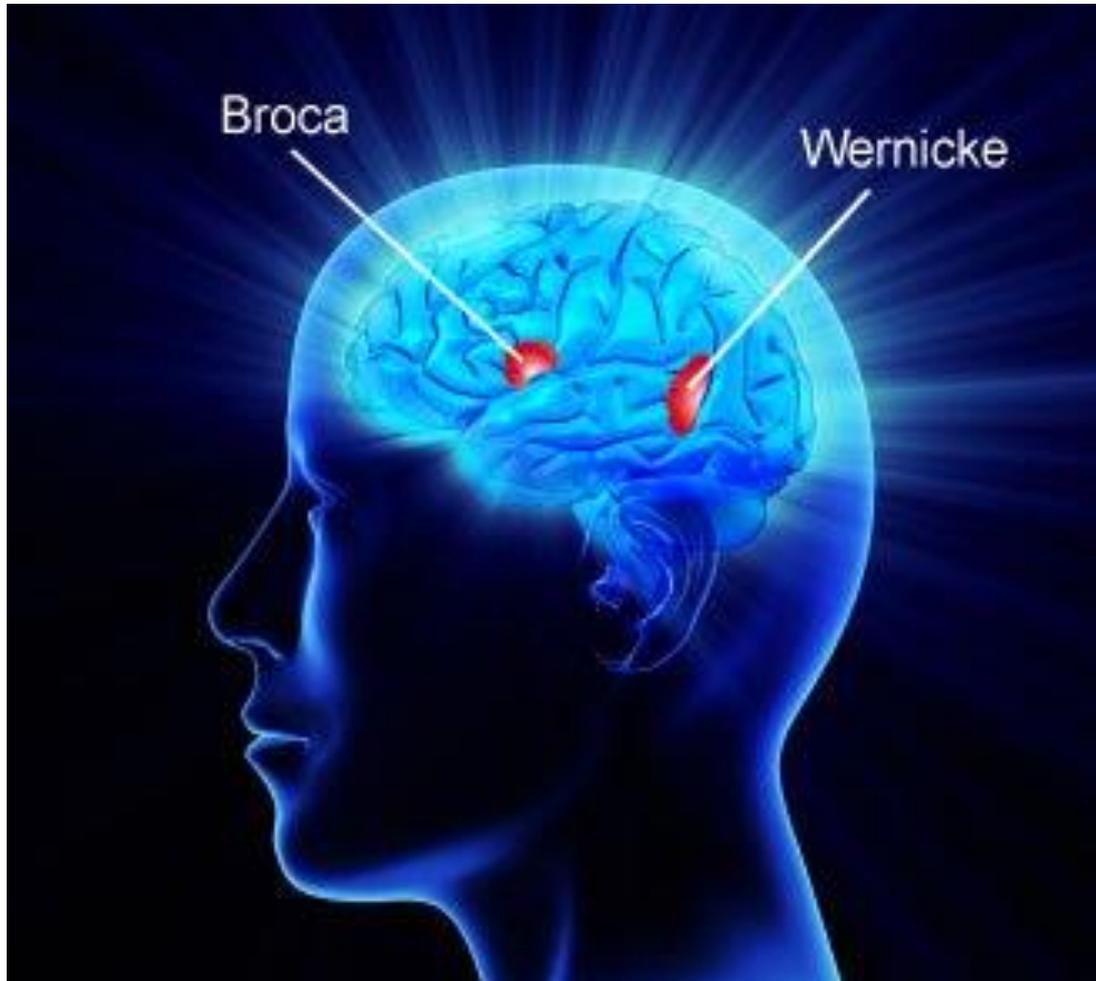
Prepared by the Defense and Veterans Brain Injury Center (DVBIC)



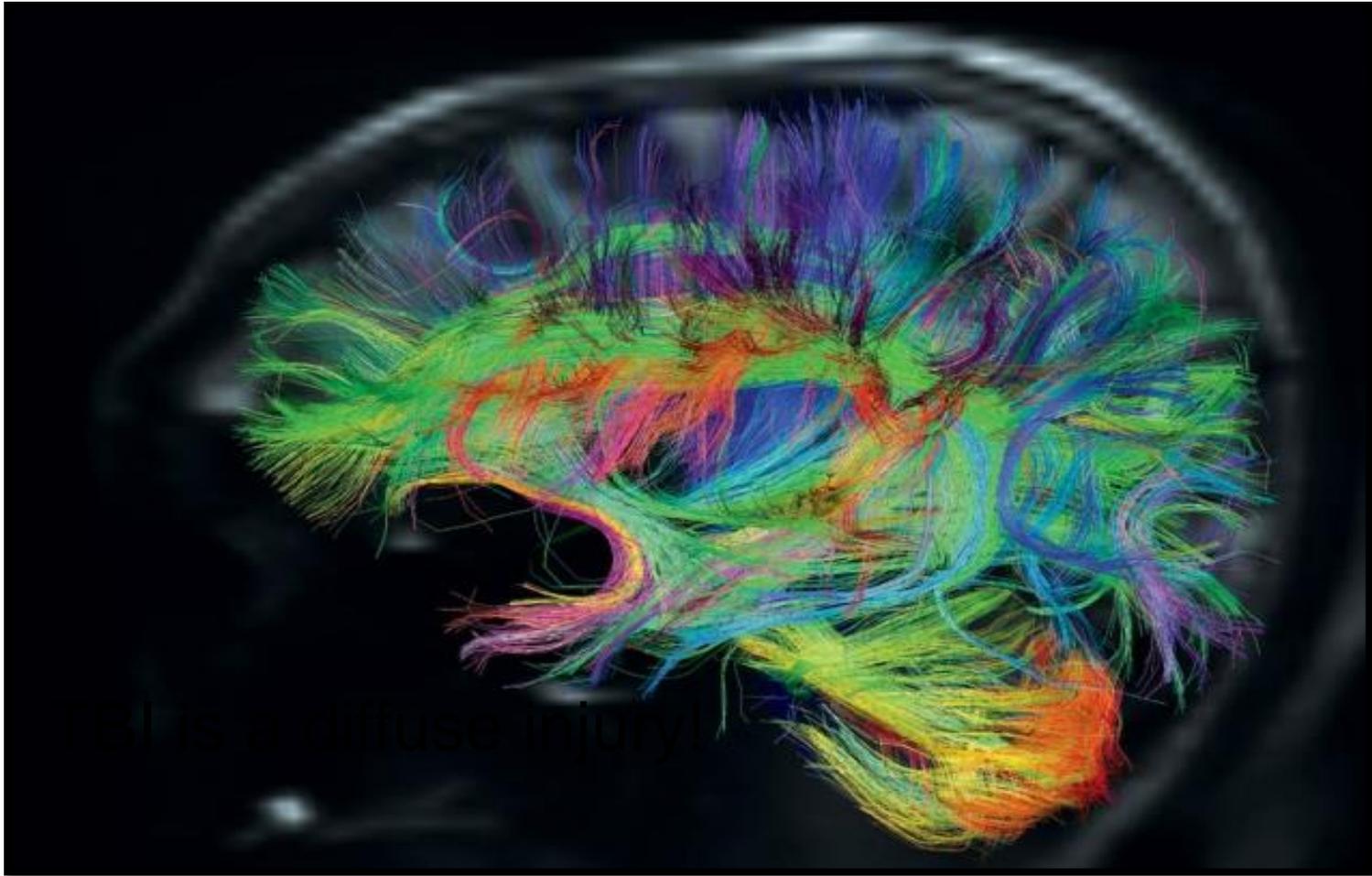
2000-2015 Q1, as of May 15, 2015

Communication

Can we localize communication?



Can we localize communication?

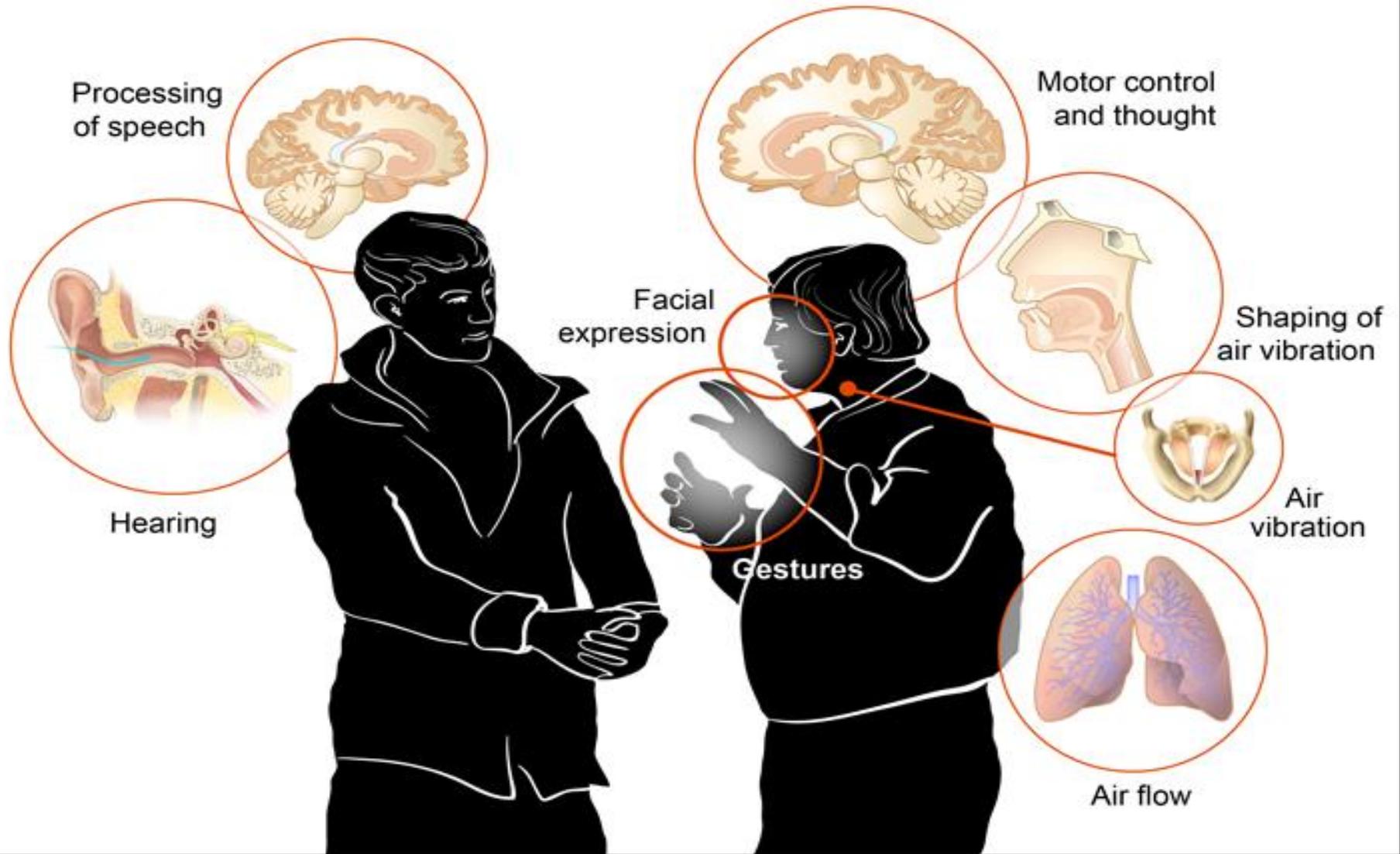


Defining communication disorders



David R. Ford 5/2007

THE ANATOMY OF LANGUAGE



Classification of communication disorders

- **Expressive:** aphasia, dysarthria, fluency, voice disorders
- **Receptive:** comprehension, hearing loss, tinnitus
- **Social communication:** verbal and non-verbal

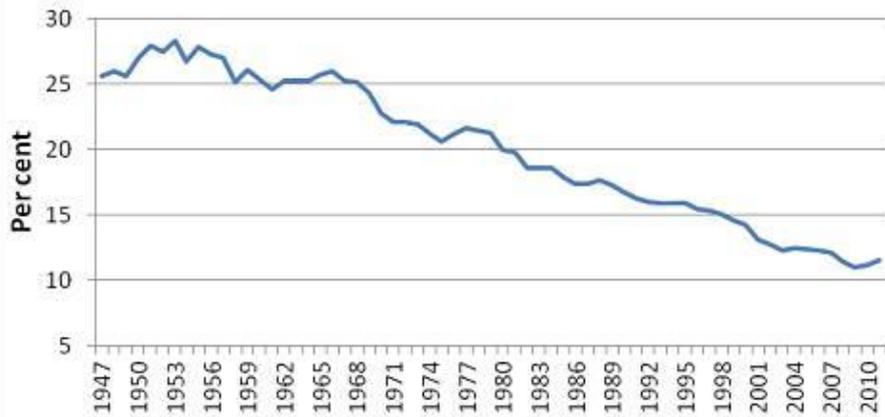
<http://www.asha.org/>

Why are we interested in communication disorders in veterans?

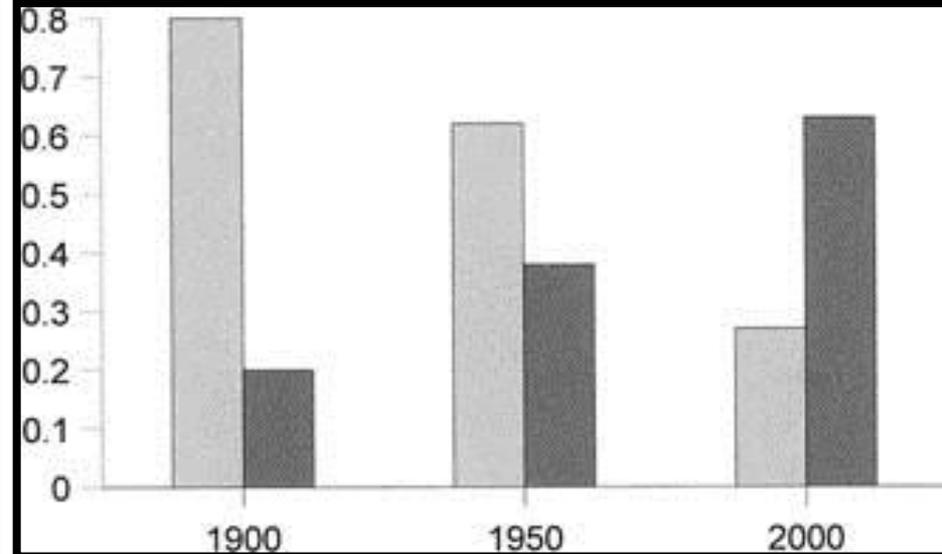
- Occurs in 5-10% of general population
- Veterans are working age, building families, part of our communities
- Current economy is dependent on communication skills *(Ruben, 2000)*

Changes in our Economy--> Changes in Employment

Share of manufacturing in U.S. GDP



Source: U.S. Bureau of Economic Analysis



Ruben, 2000

Source: US Bureau of Economic Analysis
Bureau of Labor Statistics. 2013. <http://data.bls.gov>

Effects of TBI

- Structural and nervous system damage that can affect “strength, accuracy, coordination and timing of speech”

2010)

(Cherney et al.,



Expressive Communication

- After TBI, individuals are at risk for language disorders
- Non-aphasic in nature
- Often related to cognitive-impairment
- “language is imprecise, disorganized, tangential” (LeBlanc, 2006)

Receptive Communication

- Processing concerns
- Reading
- Hearing loss
- subclinical hearing loss
- Tinnitus



Effect of physical and social environments



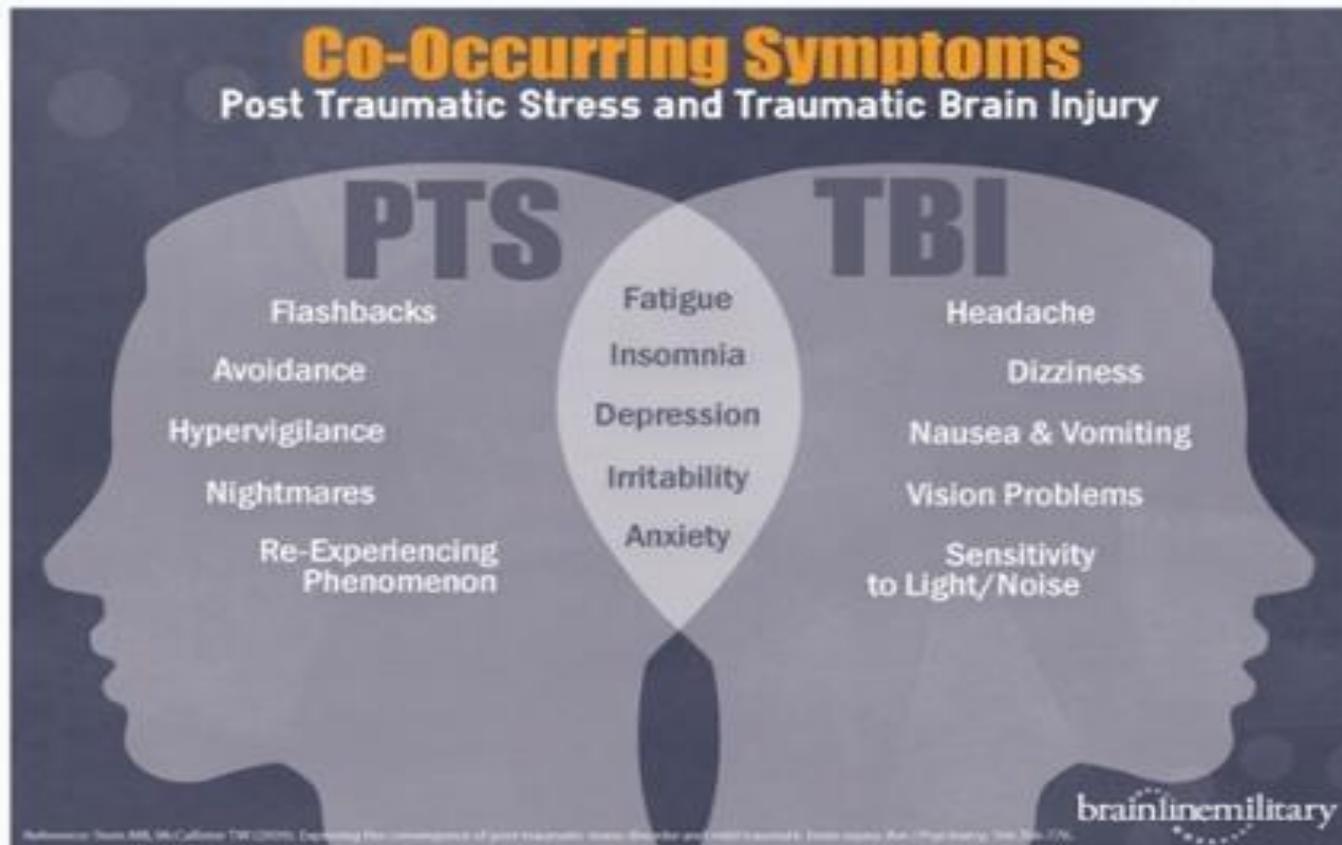
Comorbid Conditions

Effects of PTSD

- Changes in speed of information processing
- Verbal memory
- Comorbid conditions (e.g. tinnitus) are exacerbated



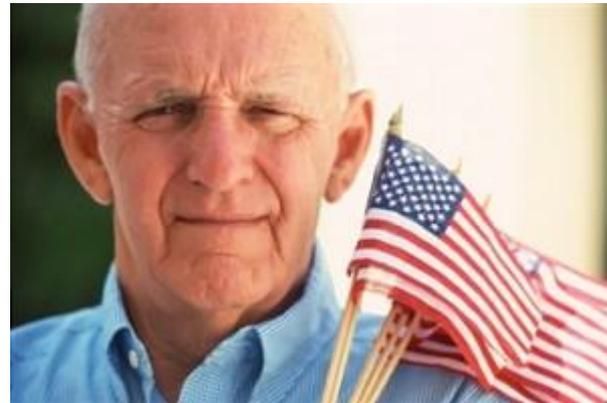
OVERLAP of TBI and PTSD



AGING

Typical aging effects on cognition:

- Information processing speed
- Working memory
- Hearing



Aging and TBI

- TBI may place individuals at greater risk for developing neurodegenerative diseases such as dementia of the Alzheimer's type and other dementias across the life span.

Vincent et al., 2014, J Alzheimer's and Dementia



Diagnosis

Diagnosing Communication Disorders in Severe TBI

- The American Speech-Language Hearing Association Functional Assessment of Communication Skills in Adults
- Behavior Rating Inventory of Executive Function
- Communication Activities of Daily Living, 2nd Ed
- Functional Independence Measure
- Repeatable Battery for the Assessment of Neuropsychological Status
- Test of Language Competence-Extended
- Western Aphasia Battery

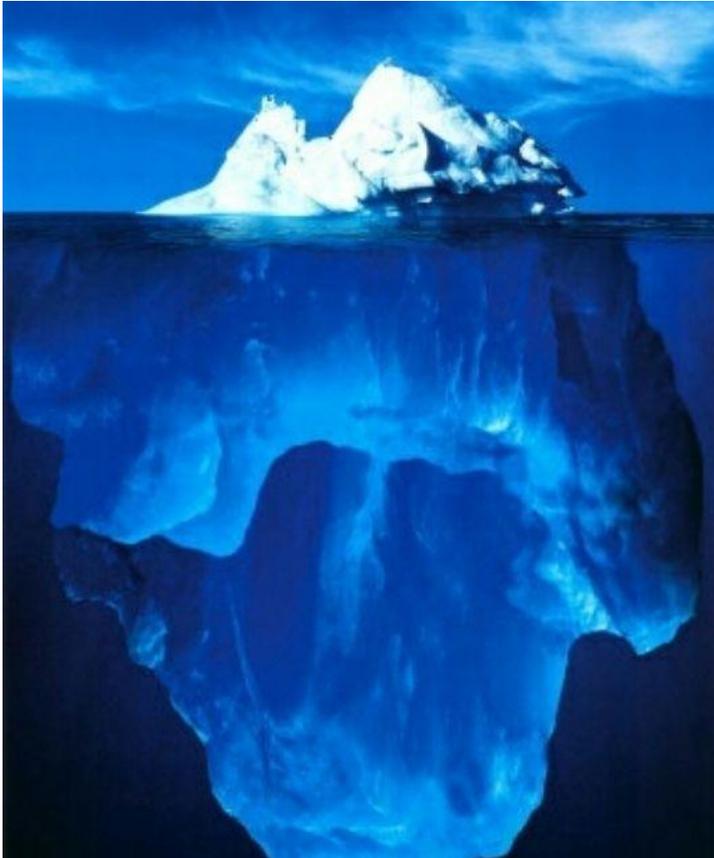
Diagnosing Hearing Impairment

- Perform otologic examination
- Review medications for ototoxicity
- Refer to audiology for comprehensive evaluation
- The comprehensive evaluation: pure tone air and bone conduction thresholds, tympanometry as well as speech reception thresholds and word discrimination.

Diagnosing Communication Disorders in mild TBI

- Gap in the literature
- Comprehension (Le Blanc et al, 2006)
- Increased latency for naming (Barrow et al., 2006)

Diagnosing Communication Disorders in mild TBI



- Deficits are subtle and difficult to capture
- Lack of appropriate instruments
- “Individuals with mTBI may present as normal despite deficits in daily functioning”
(Duff et al., 2002)

Alternatives to Standardized tests

- Patient education to normalize and validate symptoms
- Assessment of co-occurring symptoms
- Problem-focused interview (Krug & Turkstra, 2015)

ORIGINAL ARTICLE

Traumatic brain injury in veterans of the wars in Iraq and Afghanistan: Communication disorders stratified by severity of brain injury

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Abstract

Objective: To describe the prevalence of communication disorders in veterans of the wars in Iraq and Afghanistan with traumatic brain injury (TBI).

Design: Retrospective study of the prevalence of aphasia, fluency and voice disorders among veterans with different severity levels of TBI. Data was obtained from the VA National repository for OEF/OIF/OND veterans who received VA care in Fiscal Years 2010 and 2011.

Results: Among the 303 716 veterans in this study, 1848 were diagnosed with a communication disorder; 40% of these were also diagnosed with a TBI. Voice disorders were the most prevalent diagnosis (3.5 per 1000) followed by aphasia (1.9 per 1000) and fluency disorder (0.7 per 1000). Individuals with a TBI diagnosis were more likely to have a diagnosis of aphasia, followed by fluency and then voice disorder. The odds ratio (OR) of aphasia with TBI was 11.09–252.75 (95% CI = 8.78–441.52, $p < 0.01$). OR for fluency disorders with TBI was 3.58–10.41 (95% CI = 2.56–42.40, $p < 0.01$) and association of voice disorders with TBI was significant for all levels of TBI severity (OR = 1.5–6.61, 95% CI = 1.24–14.05, $p < 0.01$).

Conclusions: Veterans who sustained a TBI were more likely to have a diagnosis of a communication disorder, regardless of TBI severity. Those with TBI, including mild TBI, should be screened and evaluated for communication disorders.

Keywords

aphasia, epidemiology, fluency disorder, TBI severity, Veterans Health Administration, voice disorder

History

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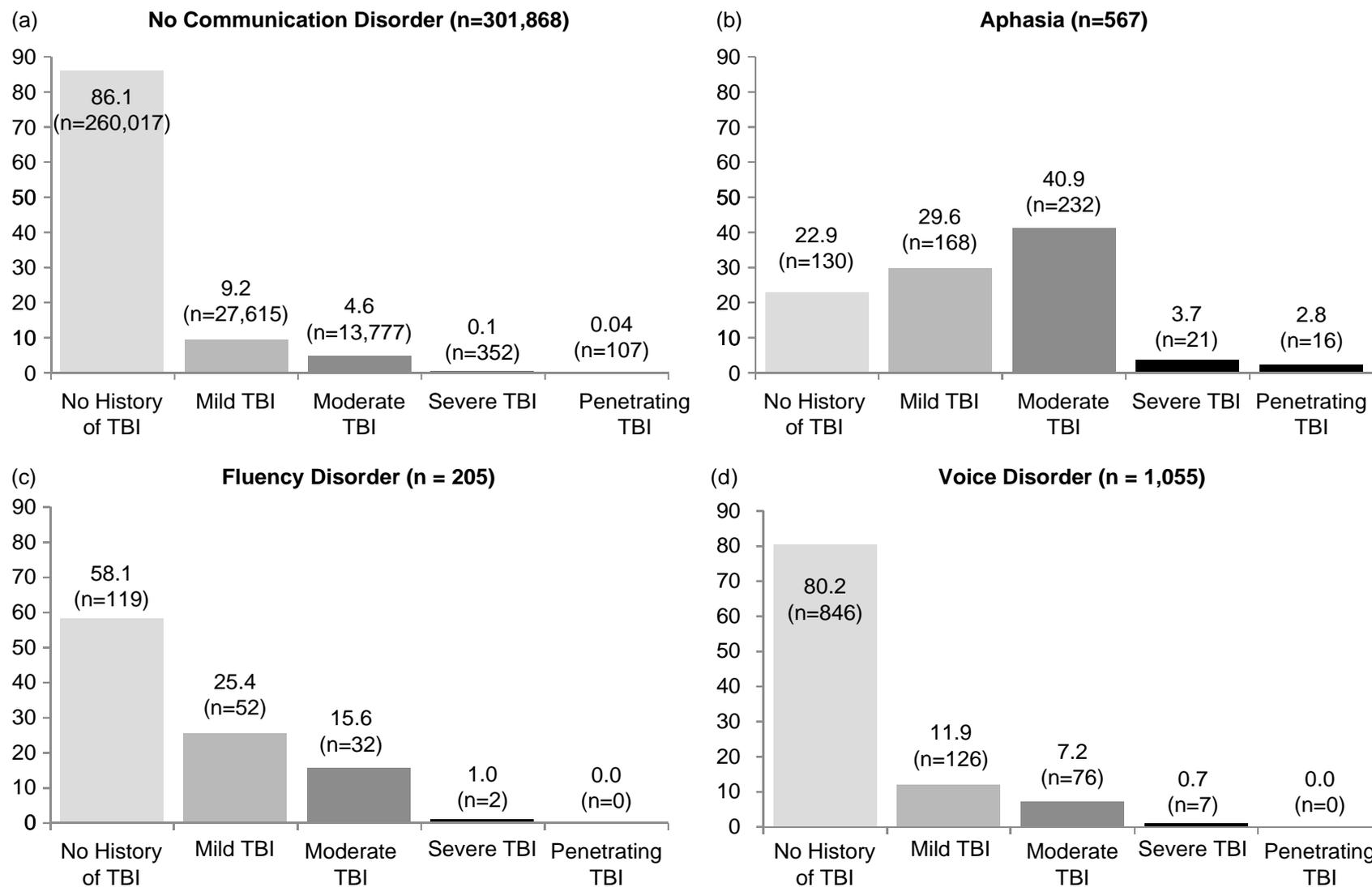


Figure 1. Prevalence of no communication disorder, aphasia, fluency disorder and voice disorder in OEF/OIF/OND veterans by TBI severity level. (a) Prevalence of no communication disorder among OEF/OIF/OND veterans by TBI severity; (b) Prevalence of aphasia among OEF/OIF/OND veterans by TBI severity; (c) Prevalence of fluency disorder among OEF/OIF/OND veterans by TBI severity; and (d) Prevalence of voice disorder among OEF/OIF/OND veterans by TBI severity.

Major Findings

- The greatest amount (9.2%, $n=27,615$) of those with communication disorder were in the mild TBI category
- **Aphasia:** majority in moderate TBI category (40.9%, $n=232$), followed by mild TBI (29.6%, $n=168$) and no history of TBI (22.9%, $n=130$)
- **Fluency disorder:** most in 'no history of TBI' category (58.1%, $n=119$), followed by mild TBI (25.4%, $n=52$) and moderate (15.6, $n=52$)
- **Voice disorders:** most in 'no history of TBI' (80.2%, $n=846$), mild TBI (11.9%, $n=126$) and moderate TBI (7.2%, $n=76$).

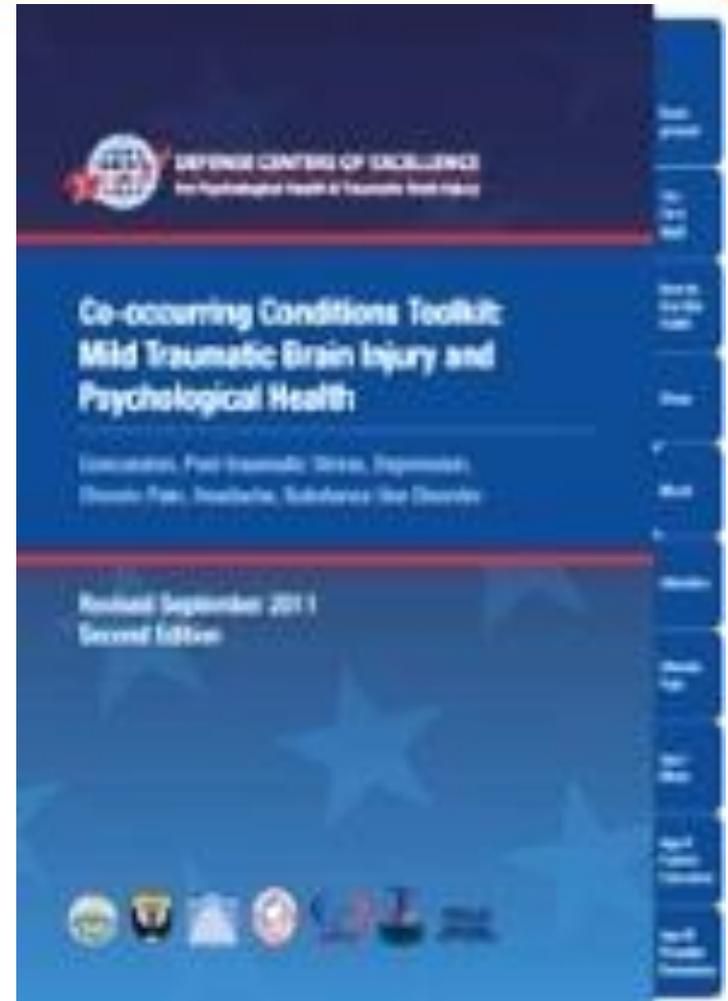
Conclusions from Norman et al. 2013

- Capturing communication disorders in mTBI is challenging
- “aphasia” for mild word-finding
- “stuttering” for word finding or speech that is filled with revisions, false starts, etc.
(Parrish, 2009)
- Currently investigating effects of PTSD & meds

Treatment

Communication

- ▶ Use short, simple sentences
- ▶ Minimize the amount that is said at one time
- ▶ Speak slowly and clearly
- ▶ Use the same words when repeating information
- ▶ Summarize key points throughout appointment
- ▶ Allow the individual extra time to respond



Communication Strategies

- Have conversations in areas with good lighting
- Limit background noise
- Gain listener's attention
- Maintain eye contact
- Keep hands away from face
- Speak naturally
- Rephrase

Interdisciplinary Team



Behm & Gray (2012)

Treatment for Severe TBI

- Disorder-specific
- Take into consideration cognitive status
- Proceduralize treatment targets

Treatments for Severe TBI

- Alter the environment (listener training, etc)
- Use assistive technology (hearing aids, AAC, voice amplification)

Treatments for mTBI

- “out of the box” treatments
- Tailored to client
- Focus on the functional goals (e.g. communication demands of the workplace)

Affective aspects of treatment

- Therapeutic alliance
- Cultural competence
- Motivation (severe vs. mild)



Case Study

32 year-old female veteran with two combat deployments to Afghanistan presents to outpatient Polytrauma clinic after screening positive on her VA TBI screen.

During her comprehensive evaluation, her major complaints include headaches, tinnitus and word-finding difficulties, particularly at her job as a full-time nurse. While at work she reports having trouble recalling medication names, lab tests and following conversations with her co-workers.

She was started on Imitrex for her migraine headaches with a decrease in frequency and duration after medication initiation.

She was referred to Audiology for her tinnitus and her audiogram evaluation results are within normal limits .

She was also referred to the SLP for evaluation of her word finding difficulties. The Western Aphasia Battery and RBANS were administered and found to be within normal limits however, the SLP notices mild word finding difficulties in conversation. The veteran seems to have trouble putting her thoughts together and requires additional processing time.

Poll Question

What would be an appropriate course of treatment for this veteran?

- a) Share results of testing , tell her nothing is wrong
- b) Validate her concerns and set up positive expectations
- c) Complete patient interview for functional goals
- d) Refer back to PCP
- e) Both b and c

Treatment Approach

- Veteran and provider develop functional word-finding goals
- Veteran begins keeping notes on common medication names on her I-phone and refers to it as needed on the job
- Veteran modifies her work environment and begins charting in a quiet space on the floor
- Veteran uses white-noise app on her phone as needed
- Veteran educates her co-workers on communication partner strategies

Clinical Implications mTBI: Treatment

- Validation of symptoms
- Team management
- Compensation vs. Restoration

Conclusion

- Communication disorders are important factors to consider in the treatment of OEF/OIF veterans
- Important for community reentry & employment opportunities

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