



NEURO
INSTITUTE

Continuing Education for Rehabilitation Professionals



Post-Traumatic Stress Disorder (PTSD) and Traumatic Brain Injury (TBI) in Combat Veterans

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Dedication

This presentation is dedicated to the men and women of the Armed Forces of the United States and their families, past and present, to whom we owe a debt we cannot repay.

“The willingness with which our young people are likely to serve in any war, no matter how justified, shall be directly proportional as to how they perceive the Veterans of earlier wars were treated and appreciated by their country.”

George Washington

Learning Objectives

1. Identify at least 3 psychiatric diagnoses other than PTSD associated with traumatic stress.
2. Identify at least 3 issues that complicate the diagnosis of TBI with PTSD in combat soldiers.
3. Identify at least 2 clinical issues that complicate diagnosis with standard psychometric tests.
4. Identify 4 clinical similarities between PTSD and TBI.
5. List 4 treatment strategies for each condition.

The Call to the Nation

- We face increased rates of co-occurring diagnoses arising from the wars in Iraq and Afghanistan.
- Military officials, soldiers, and families continue to advocate that our vets receive needed care after their psychological and physical injuries.
- Utilizing existing resources to provide treatment and care.

A Little History

- Service providers still playing catch-up at this point
- Better late than never
- Co-occurring TBI & PTSD here to stay
- Civilians suffer too
- PTSD long underdiagnosed across the board
- Clinical services should improve for all

Barriers to Treatment

- Easily misdiagnosed and undiagnosed
- Mild TBI mimics PTSD in several aspects
- PTSD confuses TBI
- ABI + PTSD frustrates treatment providers
- Something's not right....but I'm not certain what I am missing
- Dismiss what I don't understand or what does not respond to my treatment

Preparing for the Challenge

- Step 1: Familiarize one's self with various presentations of Traumatic Brain Injury
 - Physical signs and symptoms
 - Psychological Impact
 - Psychiatric symptoms
 - Cognitive effects
 - Psychosocial impact

Preparing for the Challenge

- Step 2: Familiarize one's self with signs and symptoms of Post-Traumatic Stress
 - Physical signs and symptoms
 - Psychological Impact
 - Psychiatric Symptoms
 - Behavioral Impact
 - Cognitive Impact
 - Psychosocial Impact

DSM-V Diagnostic Criteria

- A. The person has been exposed to a traumatic event in which both of the following were present:
1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or threat of physical integrity of self or others.

PTSD continued

2. The person's response involved INTENSE FEAR, HELPLESSNESS, OR HORROR

PTSD continued

B. The traumatic event is persistently RE-EXPERIENCED in one (or more) of the following ways:

1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions
2. Recurrent distressing dreams of the event
3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the event, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated)

PTSD continued

4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

PTSD continued

C. Persistent AVOIDANCE of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma) as indicated by three (or more) of the following:

1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma
2. Efforts to avoid activities, places, or people that arouse recollections of the trauma

PTSD continued

3. Inability to recall an important aspect of the trauma (amnesia, dissociation)*
4. Markedly diminished interest or participation in significant activities*
5. Feeling of detachment or estrangement from others*
6. Restricted range of affect (unable to have loving feelings)*
7. Sense of foreshortened future (e.g., does not expect to have a career, marriage, children, or normal life span)

PTSD continued

D. Persistent symptoms or increased arousal (not present before the trauma) as indicated by two (or more) of the following:

1. Difficulty falling or staying asleep *
2. Irritability or outbursts of anger *
3. Difficulty concentrating *
4. Hypervigilence
5. Exaggerated startle response

More PTSD

- Feelings of guilt over what was done/not done
- Survivor's guilt
- Other cognitive problems—memory/concentration*
- Feeling out of control and unable to do anything about it*
- Chronic worry*

More PTSD continued

- Impaired ability to regulate emotion*
- Self-destructive and impulsive behaviors (up to 75% attempt suicide)*
- Somatic complaints*
- Feelings of ineffectiveness, shame, despair, hopelessness*
- Feelings of being permanently damaged*

More PTSD continued

- Loss of previously sustained beliefs (about self and world)*
- Social withdrawal*
- Feeling constantly threatened*
- Impaired relationship with others*
- A change in previous personality characteristics*

PTSD continued

E. Duration of the disturbance (symptoms from Criterion B, C, and D) is more than ONE Month (Acute Stress Disorder is less than one month.)

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning*

Common Concurrent Disorders

Depressive disorders*

Panic D/O*

Generalized Anxiety*

Obsessive-Compulsive D/O*

Substance Abuse D/Os*

Amnesias*

Eating D/Os*

Dissociative Disorders

Self-mutilative behaviors (less common)*

More on Concurring Difficulties

- About 80% suffering PTSD will have additional psychological symptoms stemming from the trauma
- About 60% will have 3 or more additional difficulties
- About 50% will evidence depression
- 7%, Generalized Anxiety

Other possibilities

Stress Disorders

Acute Stress Disorder (ASD)

Brief Psychotic Disorder with Marked Stressors (BPDMS)

Adjustment Disorder

With depressed mood

With anxiety

With mixed anxiety and depressed mood

With disturbance of conduct

With mixed disturbance of emotions and conduct

Unspecified

Other possibilities

Conversion Disorder

Examples:

Seizures*

Paralysis*

Aphonia

Difficulty swallowing*

Blindness*

Deafness*

Stocking-Glove anesthesia

Hallucinations*

Other possibilities

- Somatization Disorder*
- Psychotic Depression*
- Panic Disorder without Agoraphobia
- Panic Disorder with Agoraphobia
- Bereavement

COMPLEX PTSD: Disorders of Extreme Distress

- Dissociative Identity Disorder
- Borderline Personality Disorder
- Combat-Stress
- Multiple life occurrences
- Childhood sexual abuse
- **LAYERS UPON LAYERS OF STRESS**

PTSD: Biological Markers

- Decreased size of Hippocampus
- Reduced glucocorticoid receptors
- Permanent effects on HPA axis
- Soft neurological changes per childhood events of long duration
- Disturbances of hormonal balances*
 - Corticosteroid and thyroid levels

Biological Markers continued

- Elevated resting heart rate within first 9 days after traumatic event
- Loss of normal EEG synchrony

Physical Effects of PTSD

- Reduction of HDL (High-Density Lipids)
- Increased myocardial infarction
- Increased rate of Obesity
- Sleep disorders, including Obstructive Sleep Apnea and Insomnia

Diagnostic Considerations: Predisposing Factors

- Characteristics of the Trauma:
 - Previous trauma: multiple/accumulated vs single exposure
 - More severe compared to less severe
 - Longer vs shorter exposure
 - Purposeful/man-made violence vs natural disaster
 - Results in death vs injury

Predisposing Factors continued

- Dismemberment or severe disfigurement
- Sexual abuse vs physical abuse
- No warning/little time to prepare vs expected (military/law enforcement training in preparation of violence, Stress Inoculation)
- Children are involved

Predisposing Factors

The Person at the Time of the Trauma

- Avoidant coping style
- Generally inadequate pre-morbid coping strategies
- Lower cognitive abilities (IQ)
- Responding with Hyper-Arousal (elevated resting heart rate w/in 9 days of TBI event)
- Significant dissociation/numbing during the trauma (feelings that trauma events and sequelea are strange or unreal; feeling out of touch or in a daze); feeling outside of oneself; being on automatic pilot (highway hypnosis)
 - Higher rate of dissociation with mild TBI

More Person at the Time of the Trauma

- Initial symptoms of re-experiencing
- Insufficient preparation/prior training for handling the event
- Co-occurring stressors/anxiety at time of the traumatic event
- Job dissatisfaction and/or insecure job future

Duty-Accumulated Related Trauma: Occupational Risks

- Military service—risk of PTSD increases with number of firefights, number of tours, number of exposures to life-threatening situations
- Law enforcement
- EMS workers
- Medical workers
- Peace-keepers in areas of military conflict or civil unrest

PTSD: Disturbances of Memory

- Denial: Too painful to consider
- Amnesias & Dissociation: Memory formed but not readily accessible
- Other factors interfering with memory formation/retrieval
- Co-occurring TBI
- Substance Abuse—Blackouts, etc.

Memory Systems



- Explicit vs Implicit
- Declarative vs Non-Declarative
- Conscious vs Subconscious

Predisposing Factors

- Person Prior to Identified Traumatic Event
 - Hx of maltreatment during childhood
 - Hx of brain injury
 - Hx of psychological difficulties, e.g., depression, anxiety, other
 - Narrow support system (few friends)
 - Significant introversion

Predisposing Factors: More Person Prior to Trauma

- Difficulty recognizing/expressing feelings
- Impaired ability to regulate emotion
- Impaired ability to relax forehead tension as detected via biofeedback methods

Associated Characteristics After Trauma

- Chronic pain/significant injury as a result of incident
- Presence of sensory hypersensitivity after trauma
- Signs of impaired peripheral vaso-constriction after trauma
- Insufficient practical assistance after trauma

Associated Characteristics After Trauma continued

- Insufficient social support by supervisors or unit (military/law enforcement personnel)
- Slow or accusatory actions by legal and administrative agencies

Making the Diagnosis

- Getting the history is a MUST!
 - Extensive history of the individual prior to the traumatic event
 - Extensive and thorough history of the identified traumatic event
 - Extensive review of post-traumatic manifestations

Making the Diagnosis

Gold Standard

- Clinician Administered PTSD Scale (CAPS)—WITH JUDGMENT provides best success for accurate diagnosis of PTSD alongside TBI
- Self-Report questionnaires produce overwhelming number of false positives
- CAPS without judgment also provides many false positives

With Judgment?

- The Scale guides the interview
- Clinical judgment guides the interpretation
- A case of misdiagnosis

Barriers to Correct Diagnosis

- Military Culture (Man up!)
- Secondary Gain (A way out)*
- ETOH/Substance Abuse*
- Toxic Exposure
- Harassment

Traumatic Brain Injury (TBI)

- What is traumatic brain injury?
- Mechanics of injury
- Consequences of brain injury
- Mild traumatic brain injury (mTBI or MTBI)
- Effects of injury

Mechanisms of Injury

- **Acceleration injuries** occur when the head is struck by a fast moving object or the pressure wave from a concussive blast.
- **Deceleration injuries** occur when the moving head strikes a fixed or semi-fixed, solid object.
- **Blast wave injury** results from the interaction of the body with the complex pressure wave created by an explosion, especially affecting fluid-filled organs (lungs, ears, GI tract) and organs surrounded by fluid (brain, spinal cord).

TBI in Warfare



Combination of any/all mechanisms of injury

- Example: Direct blast wave penetrates soldier's body AND causes shrapnel that strikes head/helmet AND also hurls soldier into nearby object (wall, vehicle, etc.)

Consequences of Brain Injury

Sensory and/or motor problems

- Hemiplegia/hemiparesis
- Visual defects
- Loss of smell
- Loss of hearing
- Loss of somatosensation
- Fine motor dyscontrol and/or incoordination
- Gait problems

Consequences of Brain Injury

Neurobehavioral Consequences

Changes in:

- Attention
- Concentration
- Memory
- Perception
- Communication
- Communication
 - Expression
 - Comprehension

Consequences of Brain Injury

Neurobehavioral Consequences (cont'd)

- Emotional control
- Personality
- Fine motor skills
- Walking
- Balance
- Sleep
- Feeding
- Ability to learn

Consequences of Brain Injury

Physical/Emotional Symptoms

- Headaches (No. 1 most frequent complaint)
- Fatigue
- Sleep problems
- Depression
- Anxiety
- Irritability
- Restlessness
- Blurred vision
- Other...

Consequences of Brain Injury

Cognitive Complaints

- Decreased mental efficiency (slowed processing)
 - Examples: Difficulty making decisions, difficult to think through problems and solutions, protracted problem solving times, slowed thinking, decreased judgment
- Impaired attention and concentration
- Decreased reasoning abilities
- Changes in personality: Mood stability, interests, drives, and social behavior

TBI Assessment

- Physical Therapy
- Occupational Therapy
- Speech Language Therapy
- Psychological/Neuropsychology
- Medical – Endocrinological, Chronic Pain, Bowel/Bladder Function, etc.

Areas of Functioning Assessed

- Attention
- Memory
- Language
- Visuospatial Abilities
- Executive Functions
- Motor Abilities
- Perception
- Emotional Functioning

Brain-behavior Relationships

- **Behavior arises from complex interactions of brain processes**
- **Location of injury related to behaviors, e.g.,**
 - Sexual orientation changes
 - Information processing abilities
 - Self-regulation abilities (Frontal Lobe)
 - Speech

Role of Neuropsychological Assessment

...is a psychometric assessment of brain-behavior relationships that can aid diagnosis, patient care and planning, treatment planning and remediation, and/or treatment effectiveness.

Value of Neuropsychological Evaluation

- Correlates test findings to brain functions
- Determines characteristics of information processing deficits, if present
- Locates sites of injury if unknown
- Makes appropriate recommendations to guide treatment

Importance of Diagnosis

- Other conditions may be present
- Those conditions may be concurrent and related, pre-existing, or independent
- Rule out or establish possible medical conditions or factors
 - Diabetes, incontinence, hypertension, hormone deficiencies, vitamin deficiencies
- Diagnosis informs treatment:
 - Pharmacological vs Psychotherapy

MTBI

“Minor brain injury’ is an oxymoron. There is nothing minor about a brain injury.”

- Lois McElvary, Motivational Speaker, TBI Survivor

Traumatic Brain Injury (TBI)

- 5.3 million Americans have long-term or lifelong need for help in performing activities of daily living due to TBI
- About 75% of TBIs that occur each year are concussions or other forms of mild TBI (mTBI)
- “Mild” TBI is a misleading term
- “Mild” should not be equated with “Insignificant” or “Minor”

Terminology

- mTBI, Mild Head Injury (MHI), Concussion, and Minor Head Trauma are overlapping but not equivalent terms
- *mTBI* is term used by rehabilitation physicians and other professionals
- *Concussion* is a term used by neurologists

Definition of mTBI

mTBI is an injury with ONE of the following:

- Any period of loss of consciousness;
- Any loss of memory for events immediately before or after the accident;
- Any alteration in mental state at the time of the accident (e.g., feeling dazed, disoriented, or confused);
- Focal neurological deficit(s) that may or may not be transient;
- Loss of consciousness (LOC) \leq 30 minutes;
- Glasgow Coma Scale (GCS) at 30 minutes post-injury = 13-15;
- Posttraumatic amnesia (PTA) \leq 24 hours

Most Likely

- mTBI is most likely to be confused with Post-Traumatic Stress symptoms due to confusion caused by overlap of symptoms.

Overlapping Signs & Symptoms

PTSD

- Insomnia/sleep problems
- Impaired memory
- Poor concentration/attention
- Depression
- Anxiety
- Irritability/mood swings
- Headaches
- Dizziness/Imbalance
- Excessive fatigue: mental and physical
- Noise/light intolerance
- Ringing in the ears
- Vision Changes: blurred or double

Overlapping Signs & Symptoms

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Severity of TBI

Predicted by:

- Glasgow Coma Scale
- Length of Loss of Consciousness (LOC)
- Length of Post-Traumatic Amnesia (PTA)

Severity of TBI Glasgow Coma Scale

Mild (Grade 1)	Moderate (Grade 2)	Severe (Grade 3)
Altered MS or LOC < 30 min with normal CT or MRI	LOC < 6 hrs with abnormal CT or MRI	LOC > 6 hrs with abnormal CT or MRI
GCS 13-15	GCS 9-12	GCS < 9
PTA < 24 hrs	PTA < 7 days	PTA > 7 days

TBI & Disturbances of Memory

- Loss of consciousness – from seconds to months/years
- Islands of memory
- Post-Concussive Amnesias
- Coma
- Recovered traumatic memories
- Constructed traumatic memories

Other Facts of Concern

- After the first TBI, 3x more likely to have a second;
- After second TBI, 8x more likely to have a third.
- TBI population 8x more likely to commit suicide.

Treatment for TBI with Co-Occurring PTSD

- Rule out physical/medical conditions
- Support medical care as needed
- Evaluate for sleep disorders/seek treatment
- Evaluate for substance abuse/start treatment
- Look for overlapping areas of concern
 - One treatment may serve for both maladies

Treatment Methods

- Medications—symptom based regimen
 - Benzodiazepines (addictive, negative impact on memory functions) May be useful for PTSD but contraindicated for TBI
- Please refer to Medication Handouts

Psychotherapy

- Cognitive-Behavior Therapy addresses psychological issues presented with both TBI and/or PTSD
 - Individual
 - Group

Treatment Methods Continued

- Exposure Therapy to counteract Avoidance Behaviors in PTSD
 - Risk re-traumatizing in presence of perseveration (Perseverative behaviors present with TBI)
 - Many clinicians skilled with PTSD do utilize
 - Some highly skilled clinicians do not for concerns exacerbating symptoms

Treatment Methods Continued

- Eye Movement Desensitization and Reprocessing (EMDR)
 - Used to reprocess traumatic memories
 - Reduces fear reactions
 - Produces changes in thoughts, feelings, and images surrounding traumatic event
 - Area of considerable research
 - Very helpful in civilian and military populations
 - VA uses method a great deal for treatment of PTSD
 - Successful within TBI population also
 - This intervention is less dependent upon intellectual functioning, insight, memory, etc.
 - Contraindicated in presence of psychosis

Treatment Methods Continued

- Treating the whole person
 - Reduce psychosocial stress across the board
 - Physical safety
 - Financial support
 - Social support network
 - Marriage and children
 - Job stress, if applicable
 - Physical health

Treatment Methods Continued

- **Speech/Cognitive Therapies** not indicated for PTSD but will be included per TBI issues
- **OT** will be needed to recover from physical impairments and establishment of necessary life skills lost as a result of TBI. Not indicated for PTSD issues.
- Many cognitive deficits presenting out of PTSD (anxiety disorder) and possibly co-occurring conditions, e.g., depression, will clear as psychiatric/psychological matters are resolved
- **Behavior Therapy**

Outcomes TBI



- Full recovery
- Partial recovery
- Lifelong impact of varying degrees of severity

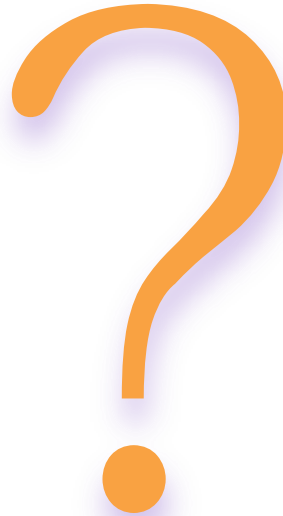
Outcomes PTSD

- Stress reactions frequently clear on their own
- PTSD if symptoms persist for more than 1 month
- Symptoms may remit completely
- Symptoms may remit partially
- Symptoms may be lifelong and resistant to treatment
- Symptoms may appear after years

Outcomes: TBI with Co-Occurring PTSD

- Recovery pattern may be any combination of remittance of symptoms
- Affected individual deserves best treatment possible
- What the individual providers know or do not know directly impacts the well-being of the individual suffering either or both condition
- Keep learning

Questions



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