DEFENSE CENTERS OF EXCELLENCE
For Psychological Health & Traumatic Brain Injury

Stress and Anxiety Following Traumatic Brain Injury

February 12, 2015, 1-2:30 p.m. (EST)

Presenter:

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Silver Spring, Md.

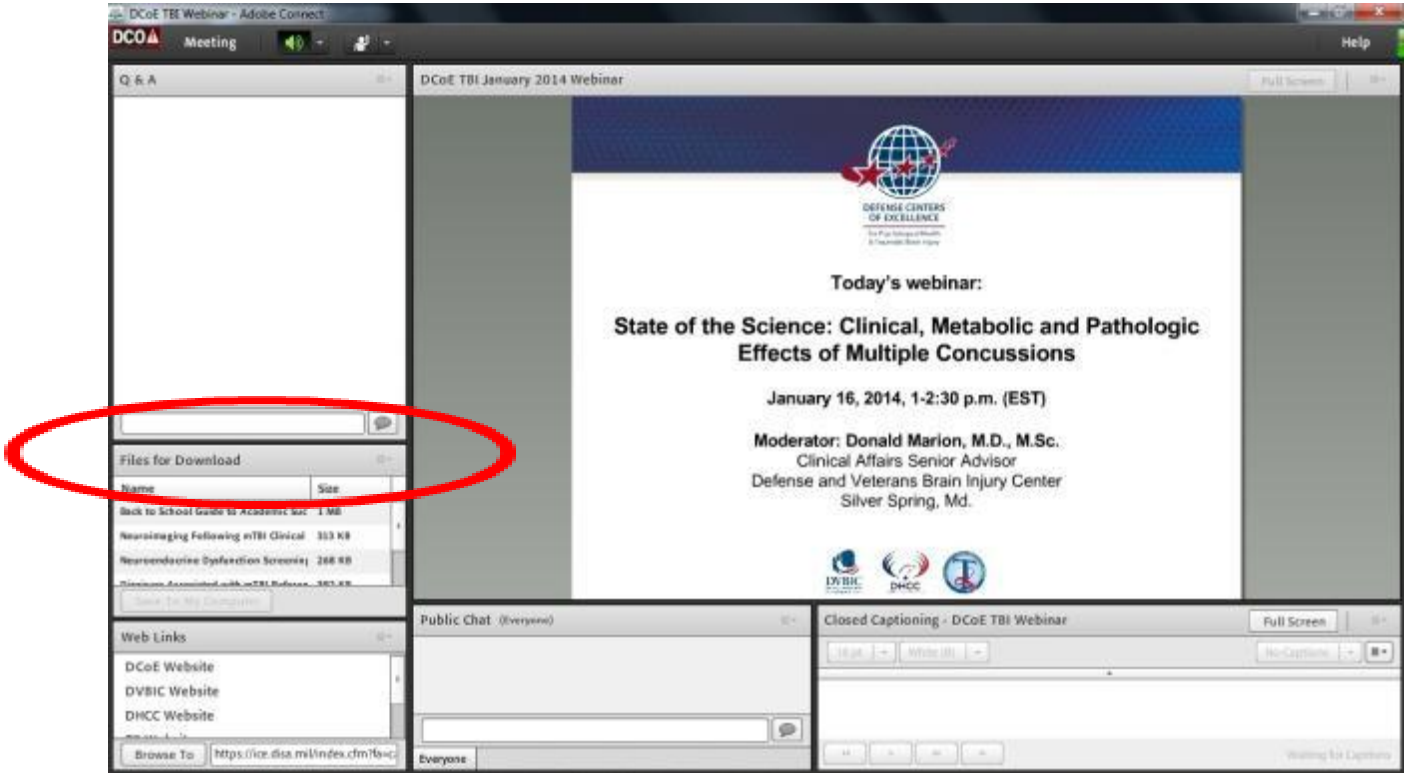
DVBIC
DHCC

Webinar Details

- Live closed captioning is available through Federal Relay Conference Captioning (see the “Closed Captioning” box)
- Webinar audio is **not** provided through Adobe Connect or Defense Connect Online
  - Dial: CONUS **800-369-2075**; International **312-470-7430**
  - Use participant pass code: **9942561**
- Question-and-answer (Q&A) session
  - Submit questions via the Q&A box

Resources Available for Download

Today's presentation and resources are available for download in the "Files" box on the screen, or visit **dvbic.dcoe.mil/online-education**



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- 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.

- All who registered **prior** to the deadline on **Thursday, February 12, 2015,** at 3 p.m. (**EST**) and meet eligibility requirements stated above are eligible to receive CE credit or a certificate of attendance.

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- The Duke Medicine website online CE evaluation and post-test will be open through **Thursday, February 19, 2015,** until 11:59 p.m. (**EST**).

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- Credit Designation – The Duke University School of Medicine designates this live webinar for:
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- Additional Credit Designation includes:
  - 1.5 ANCC nursing contact hours
  - 0.15 IACET continuing education credit
  - 1.5 NBCC contact hours credit commensurate to the length of the program
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  - 1.5 NASW contact hours commensurate to the length of the program for those who attend 100% of the program

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- Psychology: This activity complies with all of the Continuing Education Criteria identified through the American Psychological Association (APA) Continuing Education Requirements.
- NASW: National Association of Social Workers (NASW), North Carolina Chapter: Southern Regional AHEC will award contact hours commensurate to the length of the program to participants who attend 100% of the program.

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- Throughout the webinar, you are welcome to submit technical or content-related questions via the Q&A pod located on the screen. **Please do not submit technical or content-related questions via the chat pod**.
- The Q&A pod is monitored during the webinar; questions will be forwarded to presenters for response during the Q&A session.
- 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

Human behavior is a result of the constant interaction between the organism and its environment is a belief of the early 20th century psychologist Clark Hull (Freeman, Moore, & Freeman, 2009). Current research notes when injury or stress occurs, behavior reinforces the optimal biological conditions of survival.

This is just as true today when a service member survives both the stress of injury from a brain insult and the effects of the concussion/TBI when either stress or TBI may be repetitive in highly paced or frequent deployment environments. When TBI occurs on a battlefield, both a TBI and a stress/fear response occur.

If a threat or anxiety becomes overwhelming, the service member may revert to protective modes, including exacerbation of posttraumatic stress disorder (PTSD), family conflict, alcohol or substance abuse, or other maladaptive reactions. Discussion will include a variety of evidence-based assessment and treatment strategies related to stress and anxiety following TBI.

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

- Describe the complex interaction between the effects of stress and anxiety during the recovery course of TBI
- Examine and select strategies for treating comorbid symptoms with the core symptoms of TBI
- Discuss the integration of evidence-based practices into the assessment of stress and anxiety following TBI

C. Alan Hopewell, Ph.D., MP, ABPP

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- Assistant professor, Department of Psychiatry and Behavioral Health, University of North Texas Health Science Center, Ft. Worth, Texas
- Fellow, American Psychological Association
- Former TBI Center director of neuropsychology and behavioral health
- Former Defense and Veterans Brain Injury Center (DVBIC) site director at the Carl R. Darnall Army Medical Center, Ft. Hood, Texas
- Awarded *Bronze Star Medal* for Meritorious Service as a Major in the U.S. Army Medical Service Corps in support of Operation Iraqi Freedom (OIF)
- Designated "Medicine Warrior" of the 56th Medical Battalion
- Education:
  - M.S., Clinical Psychopharmacology, California School of Professional Psychology/Alliant International University
  - M.A. and Ph.D., Clinical Psychology, University of North Texas

Stress and Anxiety Following TBI

Courtesy photo by Dr. Hopewell

Mahmoudiyah terrorists

A little stress at our office with a concussion thrown in for good measure!

Could Freud have helped?

Disclosures

- The views and opinions expressed in this presentation are those of the presenter and do not represent official policy or data figures of the Department of Defense, the United States Army, DVBIC, or the Carl R. Darnall Army Medical Center, *unless so designated by other documentation*.

- The views and opinions expressed in this presentation also do not represent official policy or data figures of John Peter Smith Hospital or the University of North Texas Health Science Center *unless so designated by other documentation*.

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Learning Objectives

- Identify various ways in which anxiety can be comorbid to or can influence the symptoms and the recovery course of TBI
- Explain why it is critical to treat comorbid symptoms such as anxiety along with the core symptoms of TBI
- Familiarize self with assessments frequently used in evaluating anxiety
- Review recent innovations in the joint assessment of anxiety and TBI
- Understand and appraise strategies to choose appropriate treatment modalities and how to integrate these with the treatment of TBI

Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) Definitions

"Anxiety disorders include disorders that share features of excessive fear and anxiety and related behavioral disturbances.

Fear is the emotional response to real or perceived imminent threat, whereas *anxiety* is anticipation of future threat. Obviously, these two states overlap, but they also differ, with fear more often associated with surges of autonomic arousal necessary for fight or flight, thoughts of immediate danger, and escape behaviors, and anxiety more often associated with muscle tension and vigilance in preparation for future danger and cautious or avoidant behaviors. Sometimes the level of fear or anxiety is reduced by pervasive avoidance behaviors.

Panic attacks feature prominently within the anxiety disorders as a particular type of fear response."

(DSM-5, 2013, p. 189)

DSM-5 Definitions

"The ***anxiety disorders*** differ from one another in the types of objects or situations that induce fear, anxiety, or avoidance behavior, and the associated cognitive ideation. Thus, while the anxiety disorders tend to be highly comorbid with each other, they can be differentiated by close examination of the types of situations that are feared or avoided and the content of the associated thoughts or beliefs.

Anxiety disorders differ from developmentally normative fear or anxiety by being excessive or persisting beyond developmentally appropriate periods."

(DSM-5, 2013, p. 189)

Stress Reactions

Physical	Emotional	Cognitive	Behavioral
▪ Pounding heart ▪ Rapid breathing ▪ Sweaty palms ▪ Cold hands ▪ Cold feet ▪ Lack of energy ▪ Headaches ▪ Muscle tension ▪ Stomach disturbances ▪ Loss of libido	▪ Irritability ▪ Nervous, edgy ▪ Lack of patience ▪ Losing temper ▪ Worrying ▪ Emotional sensitivity	▪ Memory lapse ▪ Lack of concentration ▪ Increased amount of carelessness ▪ Negative attitude ▪ Pre-occupation	▪ Aggression ▪ Yelling ▪ Social isolation ▪ Crying ▪ Drinking ▪ Smoking ▪ Sleep difficulties

Case Study: “Mad” vs. “Bad” vs. “Sad” with Concussion

- Sergeant W. K., in his 20s, volunteered for wartime service. He had suffered a concussion when a grenade exploded near him on the battlefield.
- The Sergeant did light work for three years and was then recalled and reexamined for military service.
- The examination was inconclusive. The Sergeant walked with two canes, holding his head as if it were glass, but he had been working for three years steadily in a print shop. The examining psychiatrist opined that the Sergeant was malingering and simply did not want to return to combat.
- An inquest was held to review his medical treatment and duty status.

(Shepard, 2003, p. 137-138)

Case Study

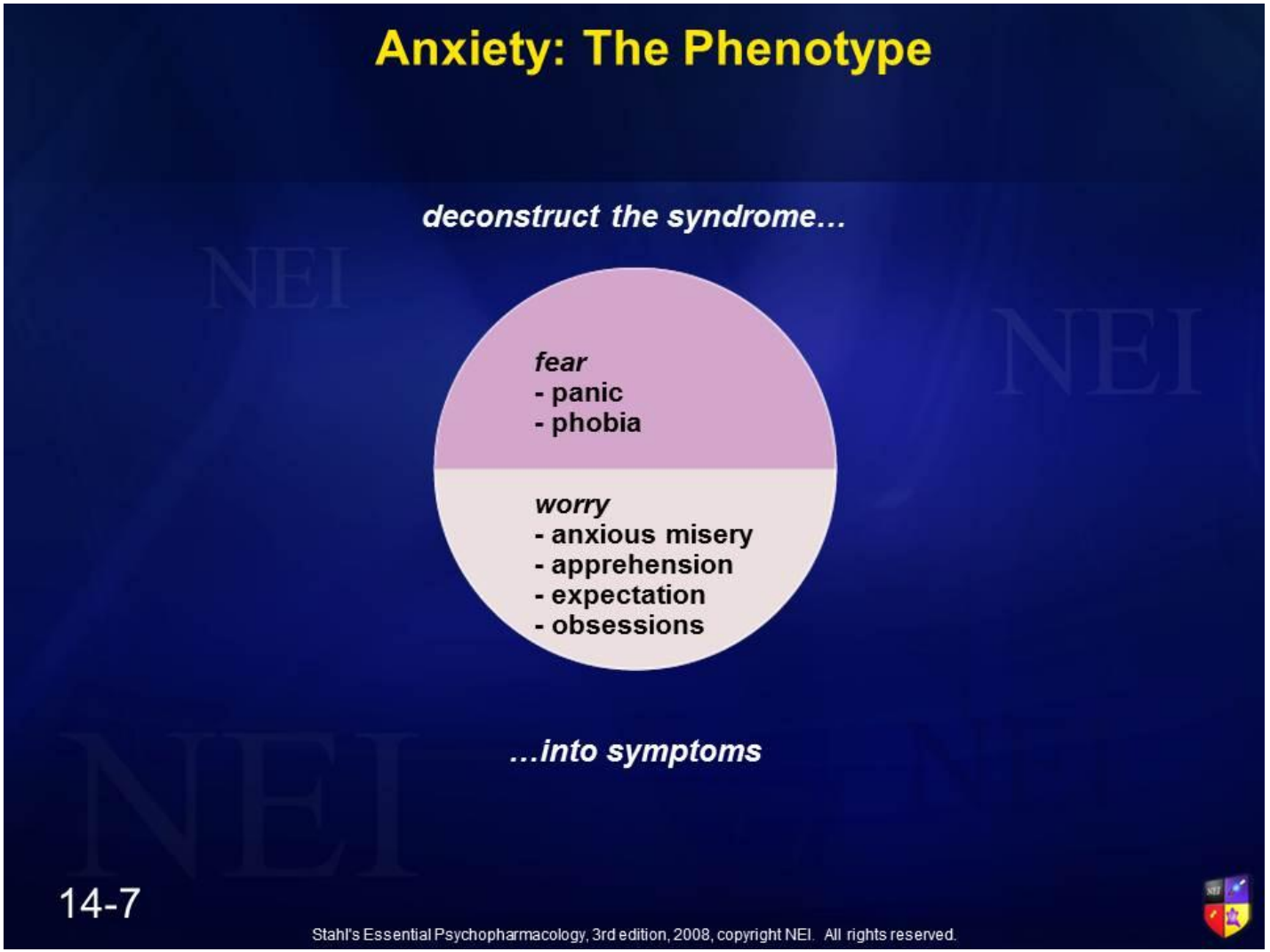
- The treating military psychiatrist had provided vocational work with plants and animals, music therapy, occupational therapy, bibliotherapy and education. He was accused, however, of being abusive by providing a variant of electrical therapy and isolating the soldier.

- A civilian “expert witness” who sat out the entire war seeing only his private patients opined that Sergeant W.K. was not malingering but had some type of organic damage. He then proceeded to lecture the military psychiatrists and the Board of Inquiry for an entire day on the exotic and impractical treatment he felt they “should” have provided.

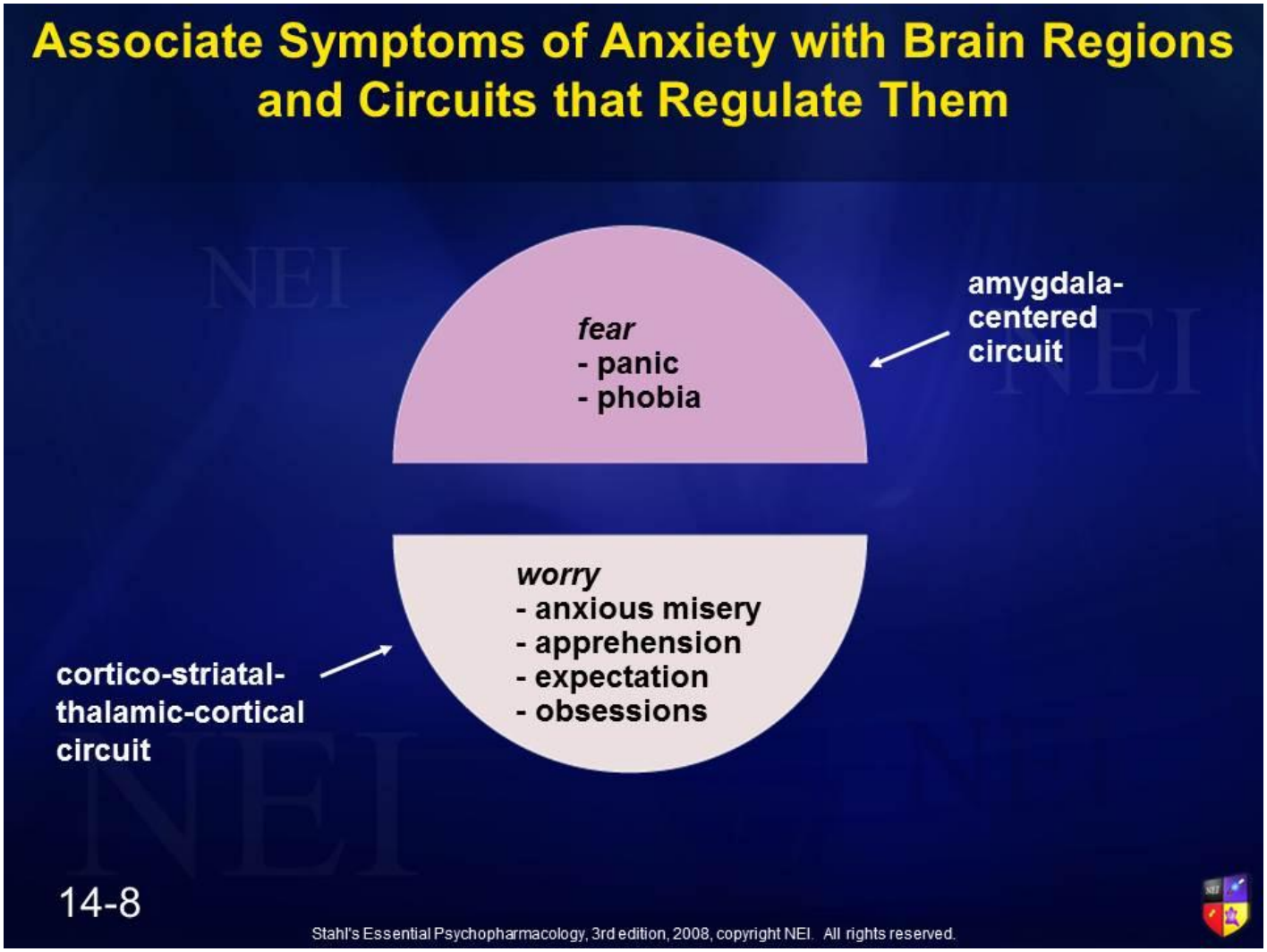
- The newspapers engaged in “exaggeration.”

(Shepard, 2003, p. 137-138)

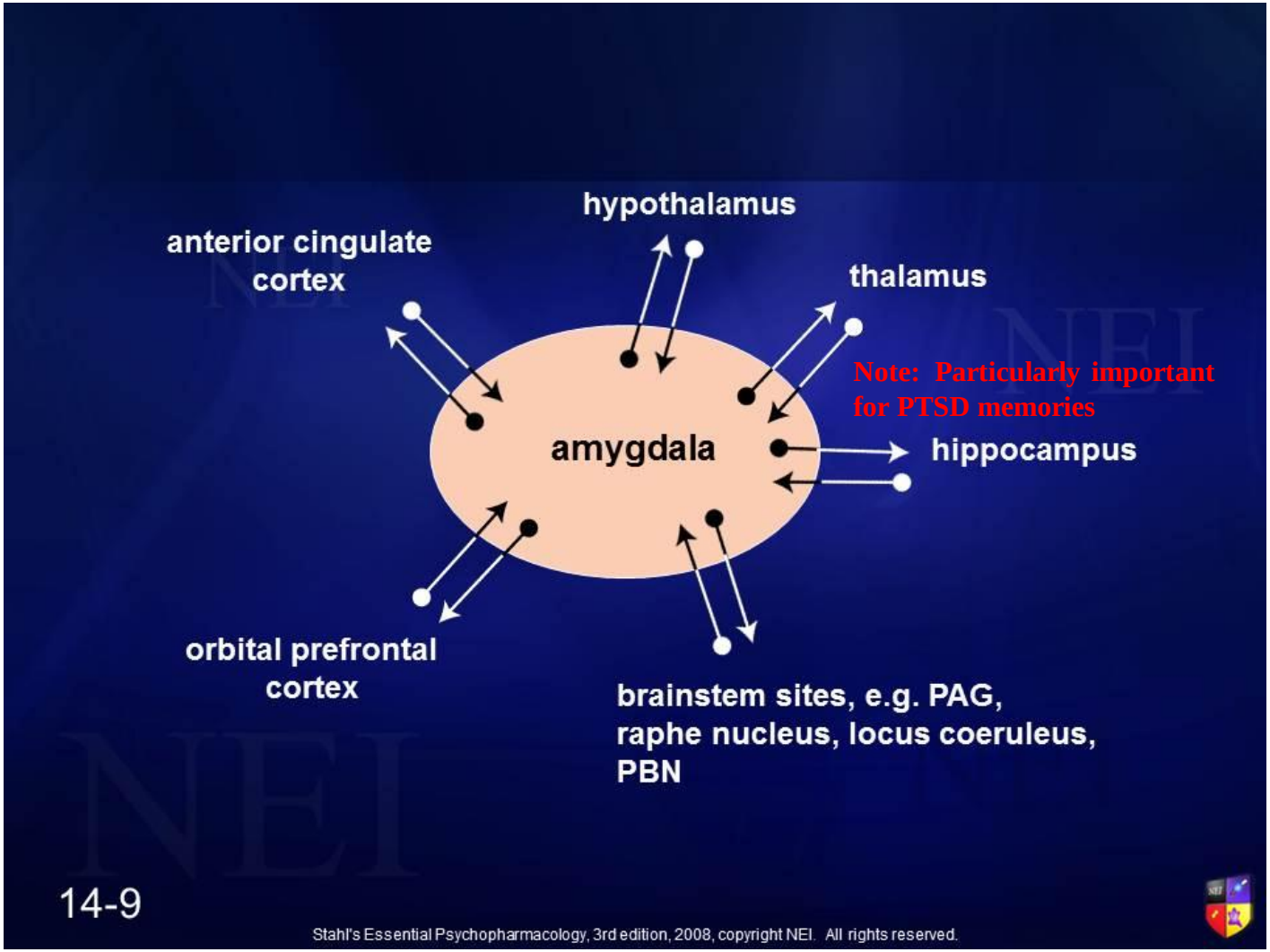
Anxiety



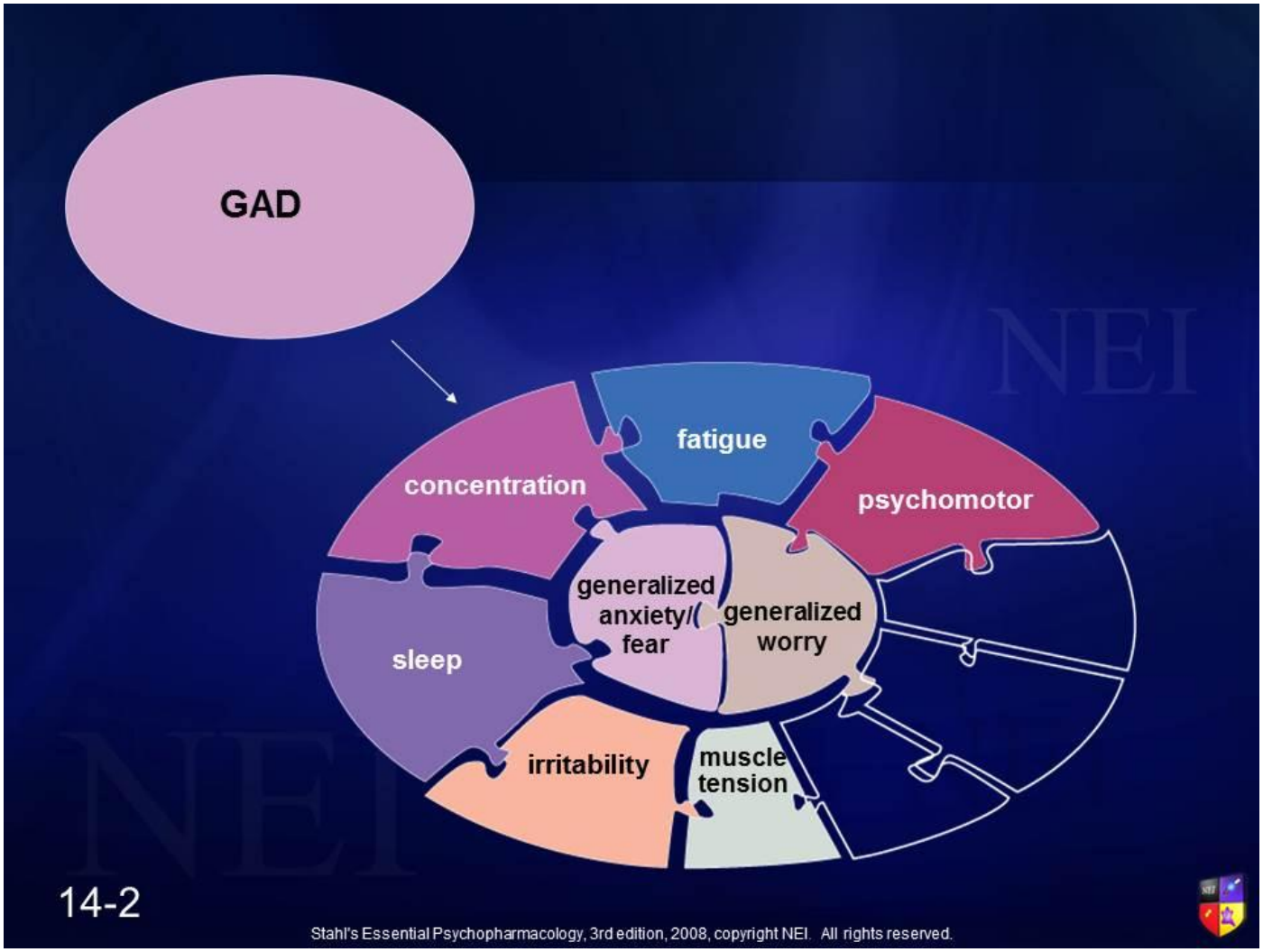
Anxiety



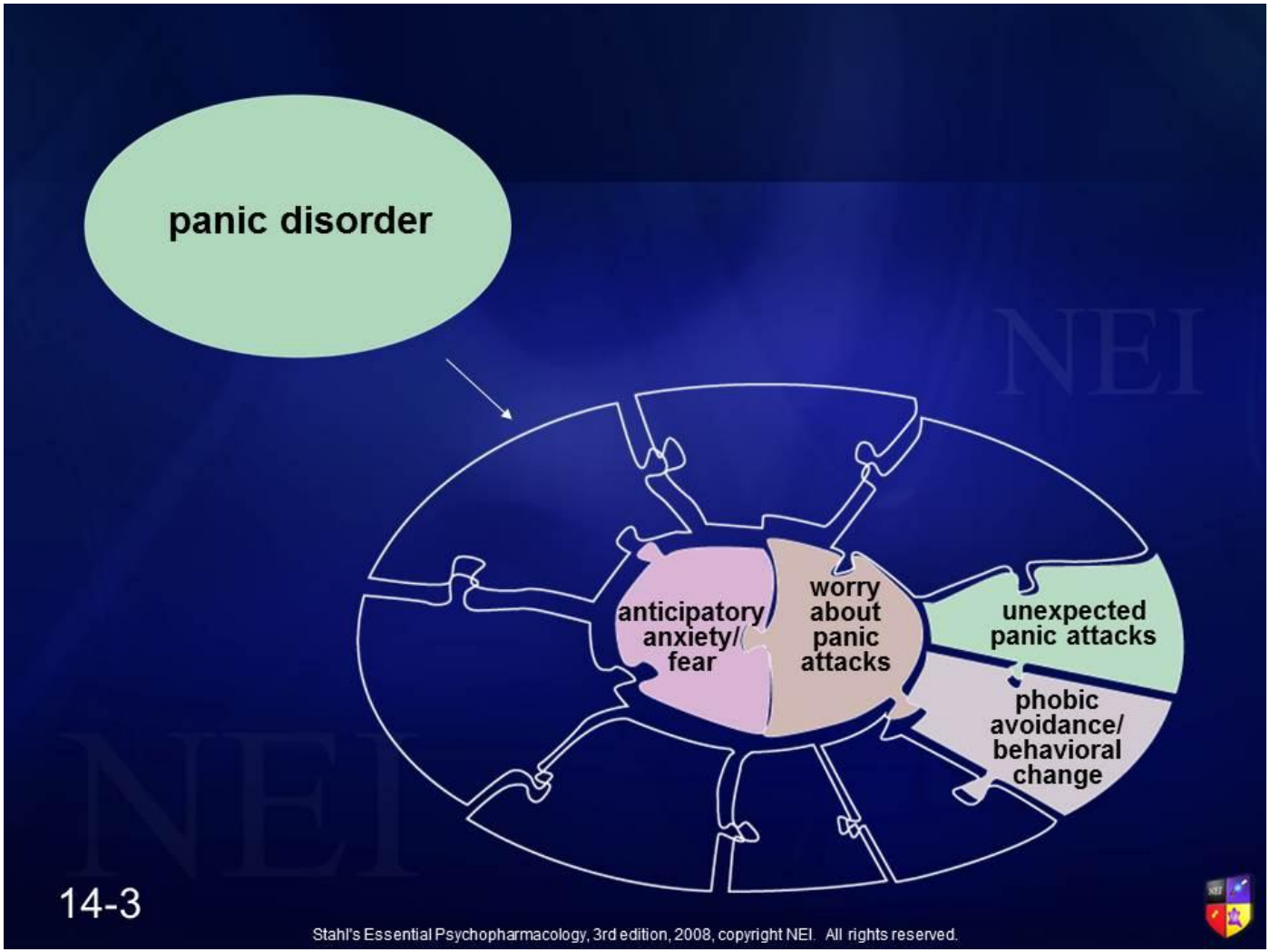
Functional Amygdala Circuits



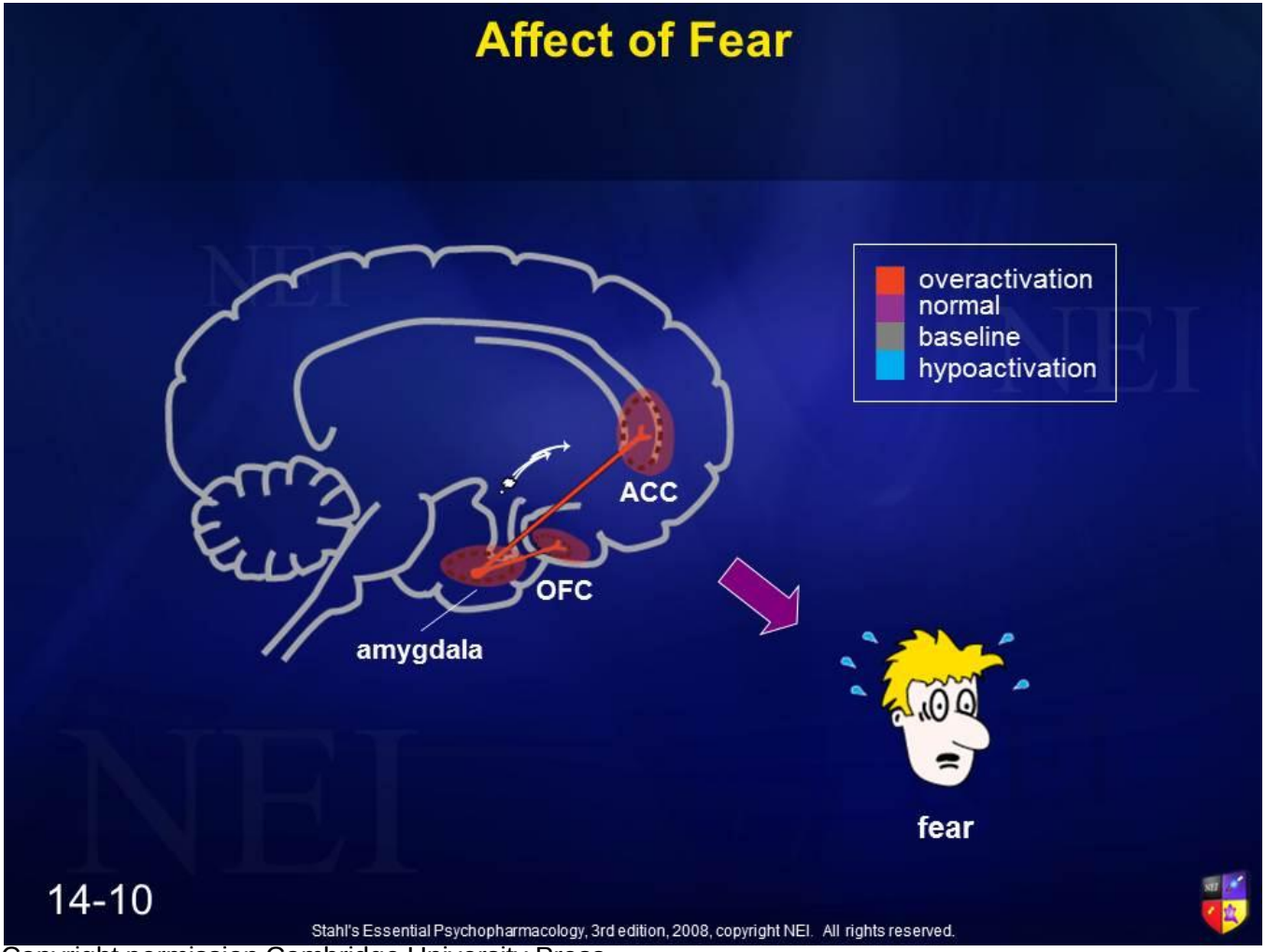
Generalized Anxiety Disorder Deconstructed



Panic Disorder

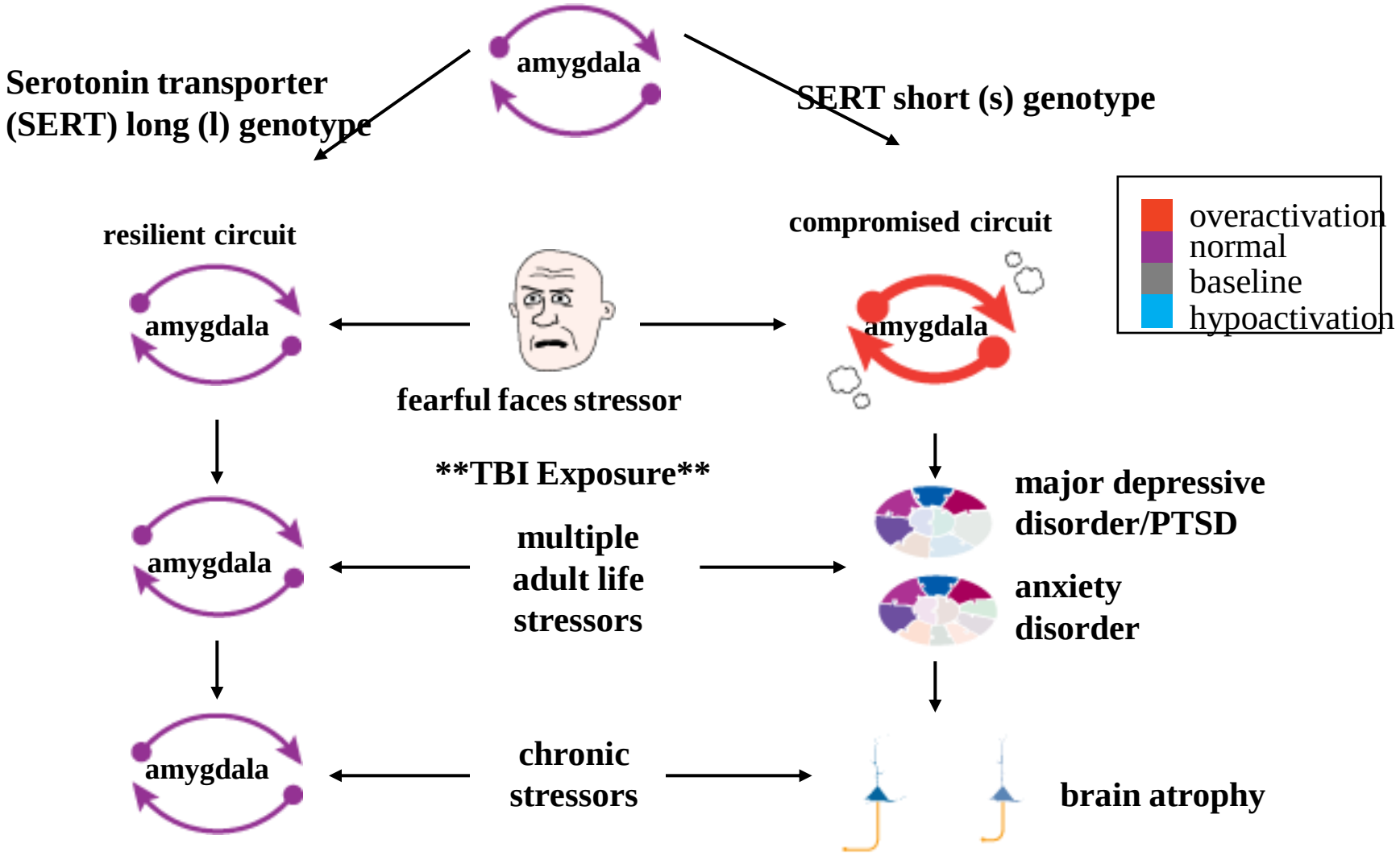


Affect of Fear



Fear and anxiety syndromes overlap with PTSD symptoms and involve many of the same neural pathways and neurotransmitters/hormones

Born Fearful? Serotonin Genetics and Life Stressors



(Stahl, 2008)

Hypothalamic – Pituitary – Adrenal (HPA) Axis

“The sympathetic division of the autonomic nervous system (SNS), which originates in the brain and distributes throughout the rest of the body, implements the brain’s mobilization of the rest of the body. The activation of the SNS increases blood pressure and pulse, dilates the pupils, increases respiratory rate, increases the blood supply to the muscles, and inhibits digestion.

The HPA axis is activated, thereby releasing a variety of stress-related hormones. Neural and hormonal signals activate the adrenal glands, which release important stress-related hormones, including epinephrine (or adrenaline) and cortisol. These hormones enter the bloodstream rapidly, acting in all organ systems to prepare the body to fight or flee.

The cost of such an adaptive hyperarousal mechanism can be substantial; the alarm reaction consumes energy and depletes stores of available neurotransmitters and hormones.”

(Moore, Hopewell & Grossman, 2009, p. 315-316)

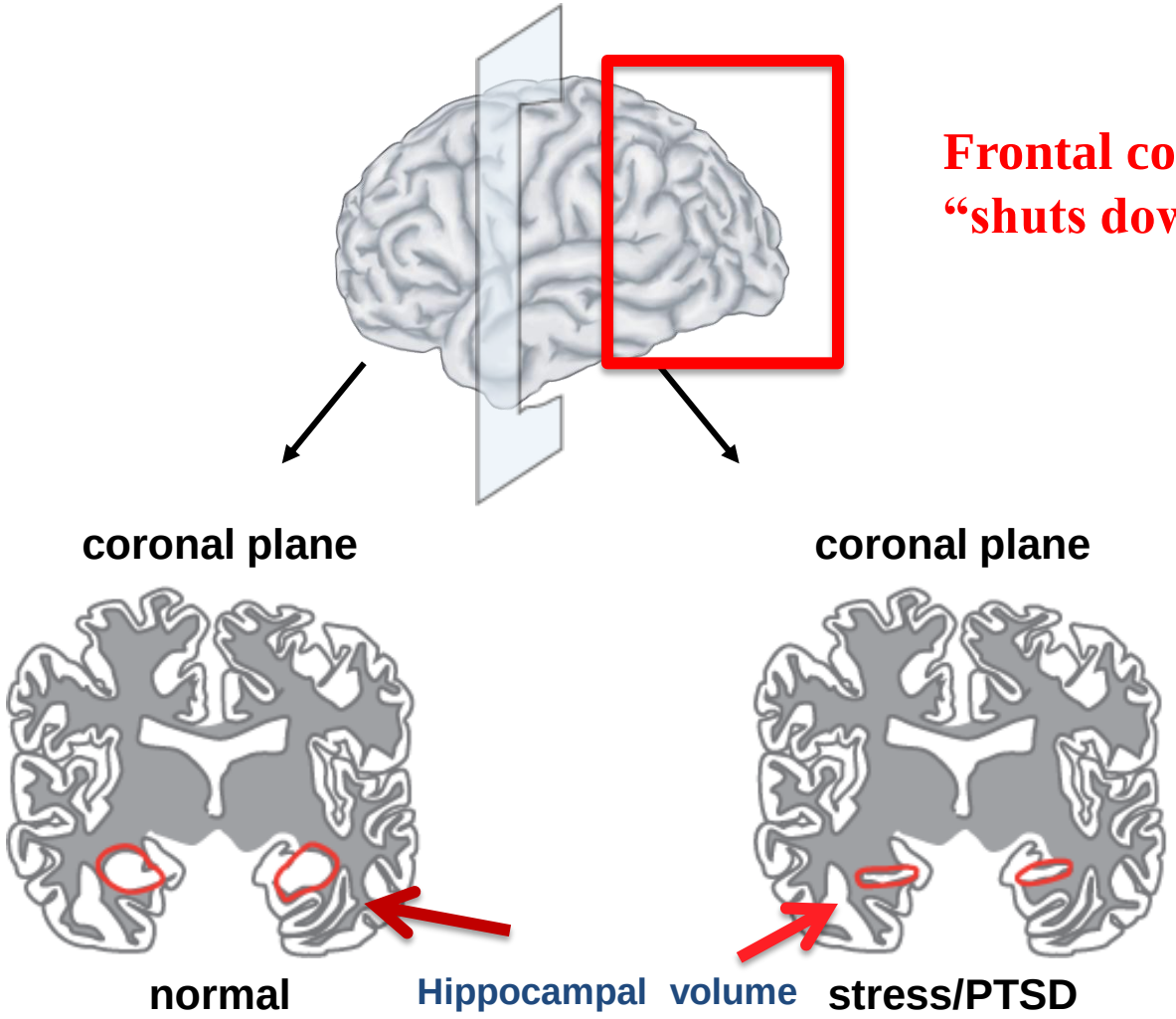
Dual/Multi-Comorbid Disorders

- When asked by a journalist “how does a soldier get over the war?,” Audie Murphy is said to have replied “I don’t think they ever really do.”
- He had depressive episodes and opioid abuse secondary to pain.
- Remember that PTSD is often a dual diagnosis disorder among both civilians and veterans.

Courtesy photo courtesy by Dr. Hopewell

Stalag Luft III Memorial
National Museum of the U.S. Air Force

Stress Both Overrides the Frontal System and Damages the Hippocampus



(Stahl, 2008)

Modifications of DSM-5 vs. DSM-IV

DSM-5 Trauma and Stress Related Disorders

- Reactive attachment disorder
- Disinhibited social engagement disorder
- **PTSD**
- **Acute stress disorder**
- Adjustment disorders

DSM-IV Anxiety Disorders

- **PTSD**
- **Acute stress disorder**
- **Etc.**

Freiherr Manfred von Richthofen – der “rote Baron”

- On 6 July 1917 during combat near Wervica, Belgium (Flanders), Freiherr Manfred von Richthofen sustained a serious head wound when a machine gun round struck his head, causing instant disorientation and temporary partial blindness.
- He regained consciousness in time to ease his aircraft out of a free-falling spin and executed a rough landing, probably even increasing deceleration forces.
- The injury required multiple surgeries to remove bone splinters and he was hospitalized and grounded for over a month.
- He returned to active service in October 1917 against medical advice but suffered from post-flight nausea, headaches, marked irritability and withdrawal.
- He suffered from “target fixation” and was shot when he flew over enemy lines, a fatal mistake.

Von Richthofen with his nurse, Sister Kate, 1917. (Allmers, 1999)
Photo courtesy of *Lancet*

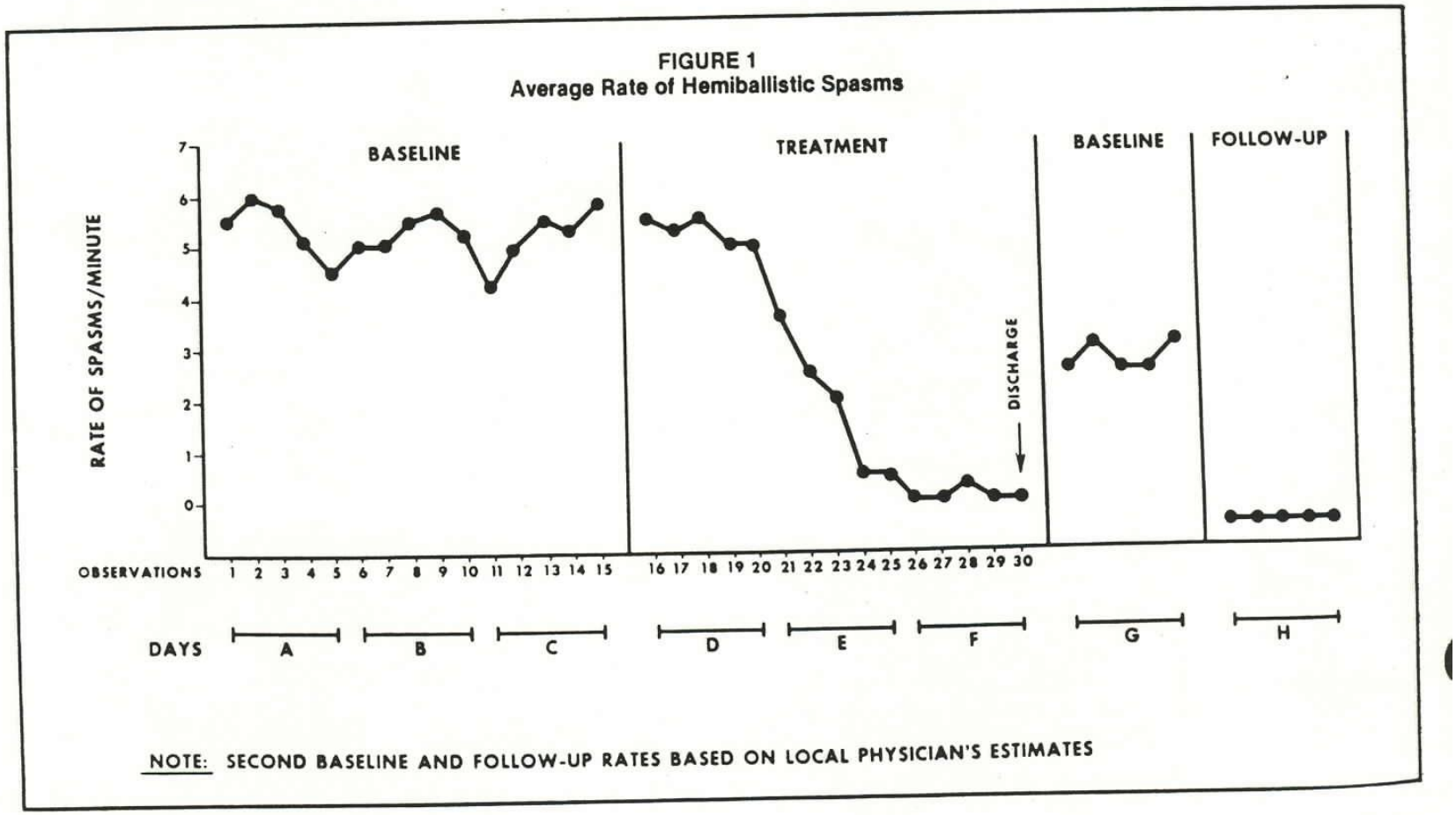
Compare with Traumatic Event Sequelae Inventory (TESI) symptoms for Operation Iraqi Freedom soldier

Freiherr Manfred von Richthofen

- In 1999, a German medical researcher found the original medical records which were still held by the family and published an article in British medical journal *The Lancet.* This article suggested that it was likely that brain damage from the head wound Richthofen suffered in July 1917 played a part in the Red Baron's death.
- Richthofen's behavior after his injury was noted as being consistent with brain-injured patients, and such an injury could account for his perceived lack of judgment on his final flight: *flying too low over enemy territory* and suffering *target fixation*.
- Contemporary descriptions also strongly indicate that Richthofen was comorbidly suffering from *cumulative combat stress* which made him fail to observe some of his usual precautions. He was observed to be:
  - Stressed at being grounded
  - Separated from his comrades and squadron
  - Stressed at being perceived a failure since he was a national hero
  - Extremely anxious to return to lead his squadron, driving him to return to flight duties too early and Against Medical Advice

(Allmers, 1999)

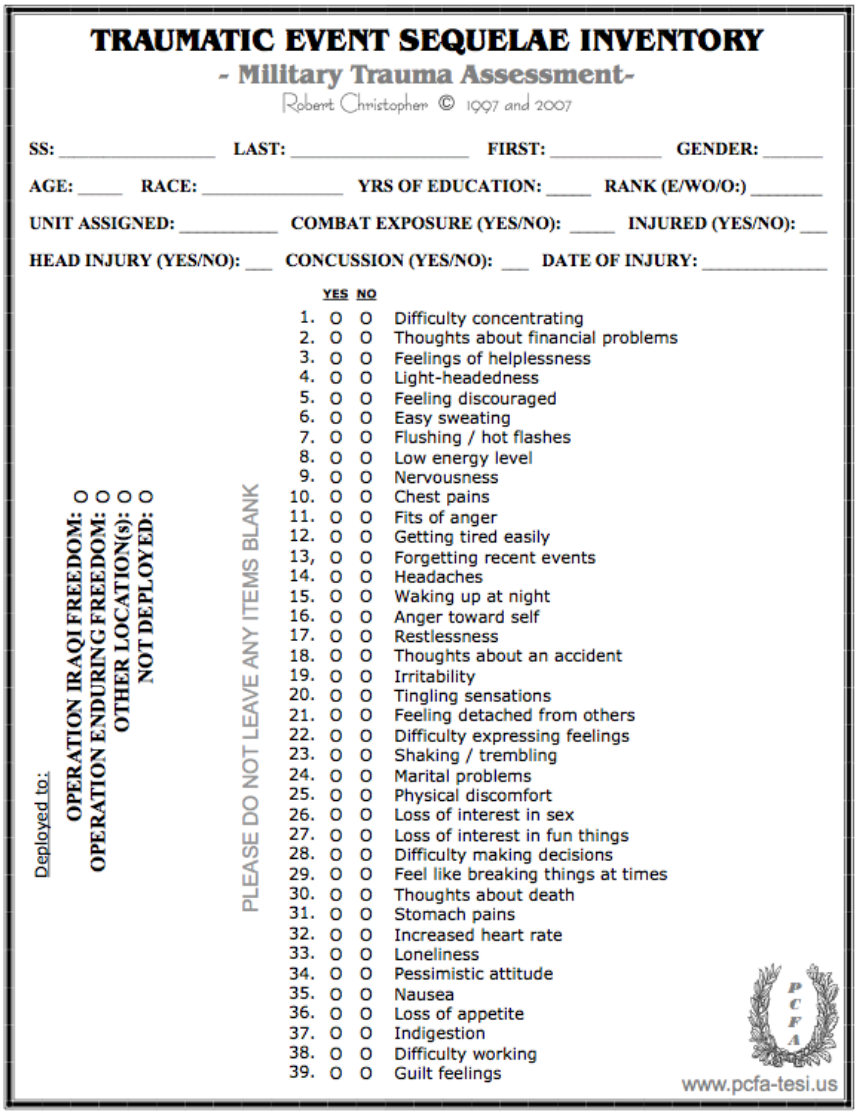
Hysteria Conversion – From Vienna to Landstuhl



12 year old Anglo girl sustained concussion after falling from motorcycle

(Hopewell, 1983)

Measurement of Stress Along With TBI



TRAUMATIC EVENT SEQUELAE INVENTORY

- Military Trauma Assessment-

Robert Christopher © 1997 and 2007

SS: _____ **LAST:** _____ **FIRST:** _____ **GENDER:** _____

AGE: ____ **RACE:** _____ **YRS OF EDUCATION:** ____ **RANK (E/WO/O:)** _____

UNIT ASSIGNED: _____ **COMBAT EXPOSURE (YES/NO):** ____ **INJURED (YES/NO):** ___

HEAD INJURY (YES/NO): ___ **CONCUSSION (YES/NO):** ___ **DATE OF INJURY:** _____

Deployed to:

OPERATION IRAQI FREEDOM: O
OPERATION ENDURING FREEDOM: O
OTHER LOCATION(s): O
NOT DEPLOYED: O

PLEASE DO NOT LEAVE ANY ITEMS BLANK

	YES	NO	
1.	O	O	Difficulty concentrating
2.	O	O	Thoughts about financial problems
3.	O	O	Feelings of helplessness
4.	O	O	Light-headedness
5.	O	O	Feeling discouraged
6.	O	O	Easy sweating
7.	O	O	Flushing / hot flashes
8.	O	O	Low energy level
9.	O	O	Nervousness
10.	O	O	Chest pains
11.	O	O	Fits of anger
12.	O	O	Getting tired easily
13,	O	O	Forgetting recent events
14.	O	O	Headaches
15.	O	O	Waking up at night
16.	O	O	Anger toward self
17.	O	O	Restlessness
18.	O	O	Thoughts about an accident
19.	O	O	Irritability
20.	O	O	Tingling sensations
21.	O	O	Feeling detached from others
22.	O	O	Difficulty expressing feelings
23.	O	O	Shaking / trembling
24.	O	O	Marital problems
25.	O	O	Physical discomfort
26.	O	O	Loss of interest in sex
27.	O	O	Loss of interest in fun things
28.	O	O	Difficulty making decisions
29.	O	O	Feel like breaking things at times
30.	O	O	Thoughts about death
31.	O	O	Stomach pains
32.	O	O	Increased heart rate
33.	O	O	Loneliness
34.	O	O	Pessimistic attitude
35.	O	O	Nausea
36.	O	O	Loss of appetite
37.	O	O	Indigestion
38.	O	O	Difficulty working
39.	O	O	Guilt feelings

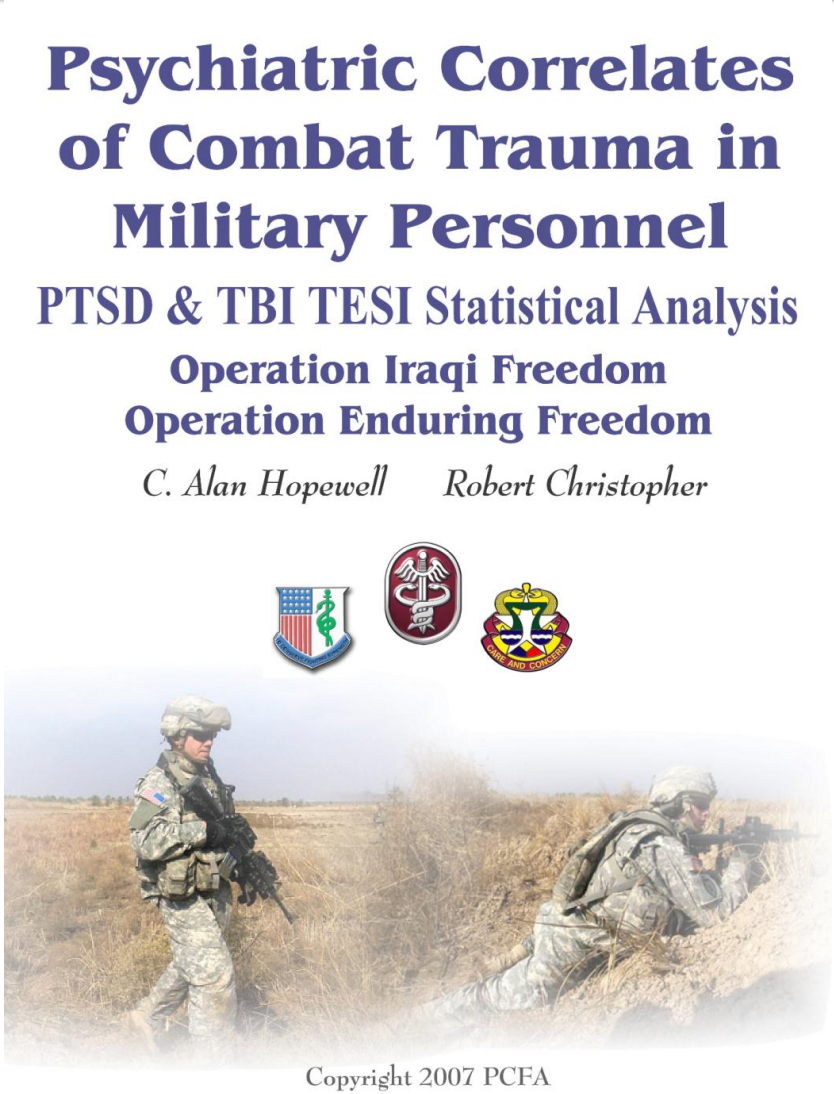
PCFA

www.pcfa-tesi.us

www.pcfa-trauma.us

www.pcfa-tesi.us

Psychiatric Correlates of Combat Trauma



We would expect that:

- People with concussion would be more emotionally upset than people without concussion.
- Females might react more strongly than males.
- This is exactly what we found with 6,000 4th ID cases at Fort Hood. Concussion raised the level of distress by about one level, and males generally were about one level LOWER than females in overall distress.

Camp Liberty 785th Patient

- 24 year old male, 4th Infantry Division (ID), two months status/post vehicle-borne improvised explosive device
- "Hey, Doc!! Want to see me get blown up?!?"

Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)

	Immediate Memory	Visuospatial	Language	Attention	Delayed Memory	Total
Index Score	87	121	78	56	83	80
%ile	18	91	7	0.3	15	9

Data courtesy of Dr. Hopewell

Traumatic Event Sequelae Inventory (TESI)

Gradient Frequency Score Levels (GFS) = 8

GFS Levels range from 1 to 8

CLINICAL ISSUES	STATUS
Social withdrawal	**Severe**
Communication deficits	Severe
Manipulativeness	Severe
Cognitive deficits	Severe
Academic difficulties	Severe
Hopelessness	**Severe**
Inadequate self-care	**Severe**
Dissociation	**Severe**
Dysphoric mood	**Severe**
Concentration deficit	**Severe**
Attention deficit	Severe
Ego implosion	Severe
General functional disturbances	**High**

Red - highlighted symptoms suffered by von Richthofen as well?

Data courtesy of Dr. Hopewell

Minnesota Multiphasic Personality Inventory – Two Results

				1	2	3	4	5	6	7	8	9	0
	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
T-Score	39	85	39	68	93	71	64	48	86	91	89	62	73

- Unanswered (?) Items = 0
- Welsh Code: 27 *86"03'149-5: F"L#K#

Data courtesy of Dr. Hopewell
OIF Surge

Concussive Syndromes Are Not a Spectrum Disorder

Hopewell Classification to the National Brain Injury and Texas Brain Injury Foundations, 1980s

- Type I – *Uncomplicated concussion*
  - A single uncomplicated concussive episode produces transient cognitive and affective symptoms which resolve within days or weeks.

- *Type II – *Concussion complicated by emotional factors*
  - Single or repeat concussive episode(s) produce(s) cognitive and affective symptoms which persist and which are influenced or exacerbated by emotional factors, anxiety or secondary gain.

* Most likely to be affected by anxiety

Hopewell Classification

- * Type III – *Concussion complicated by other medical factors*
  - Concussive episode(s) produce(s) cognitive and affective symptoms which persist and which are influenced or exacerbated by concomitant medical factors such as post-traumatic seizure, tinnitus, headache, concussion complicated by chronic alcohol abuse, or serious other medical complications, such as chronic pain associated with severe orthopaedic injuries.

- Type IV – *Cumulative concussion*
  - A concussive episode produces cognitive and affective symptoms which are compounded by the symptoms of multiple pre-existing concussive injuries, such as occurs in repeated injuries or *dementia pugilistica.*

* Most likely to be affected by anxiety

Hopewell Classification

- * Type V - *Concussion complicated by factitious disorder or dissimulation*

- A poorly documented or doubtful concussive episode produces cognitive and affective symptoms which are bizarre, severe, atypical in nature and which frequently present as a delayed or progressive dementia. Such dissimulation may be in the form of the factitious disorders or overt malingering, and generally takes the form of *pseudodementia* or presents a bizarre clinical picture. Secondary gain may be considerable.

* Most likely to be affected by anxiety

Personality Assessment After TBI

- Few, if any personality tests designed, normed or standardized for a brain injury population
- Traditional batteries often ignore or inadequate
- Un-normed tests often adapted
- The International KAS-R Project **- <u>Largest TBI personality study to date</u>** and remains one of the few studies with adequate controls

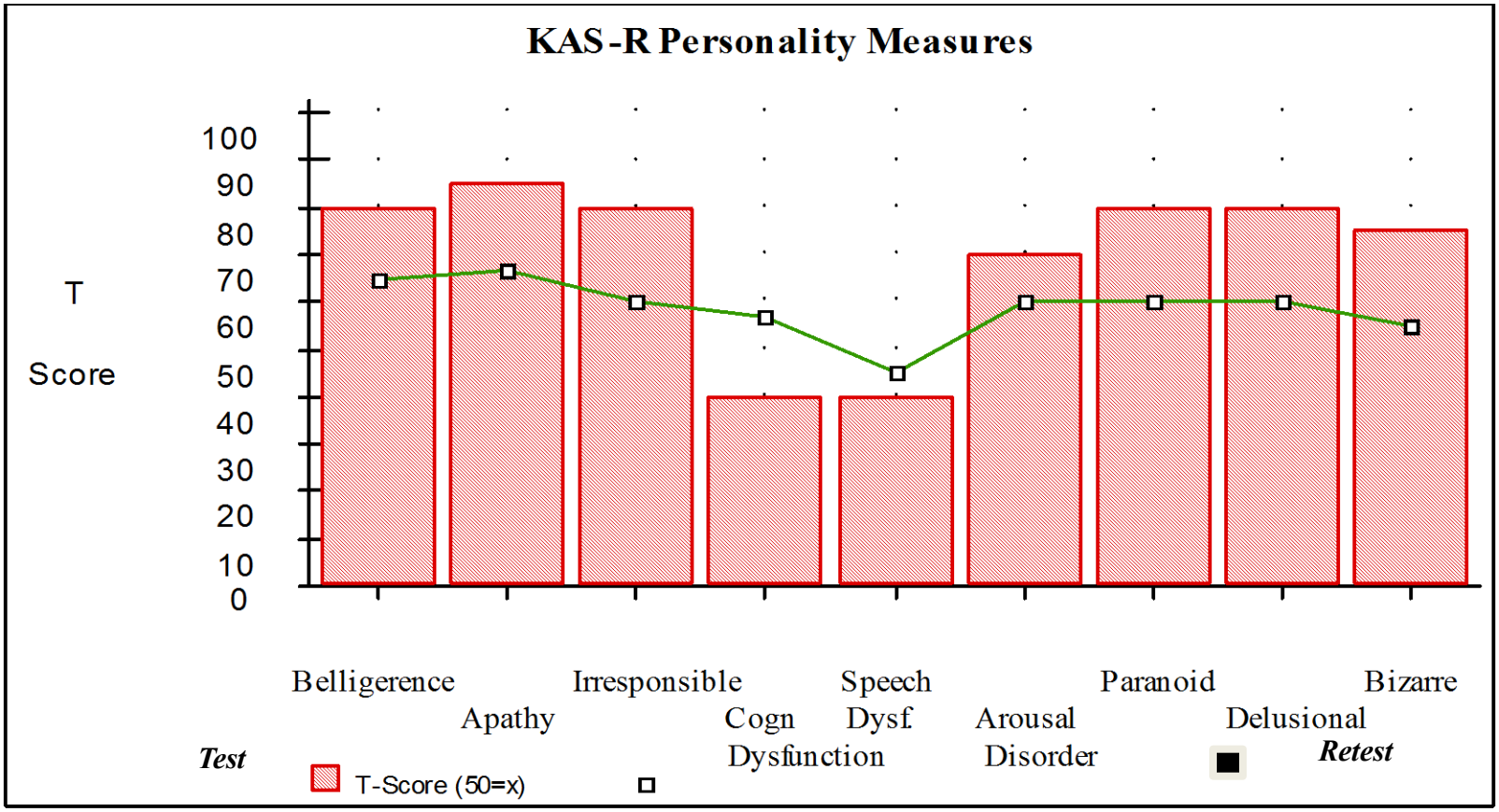
(Jackson et al., 1992***)***

Katz-Lyerly Scale

- The development of measures for assessing adjustment and characterizing patterns of disturbed behavior is described.
- The major characteristics are the translation of psychopathology into everyday language and the use of the relative to measure social behavior.
- The scales are applied to the long-term evaluation of psychiatric treatments.
- Social Sciences Citation Index® indicates that this paper has been cited over 200 times since 1963.

(Katz & Lyerly, 1963)

KAS-R Test/Retest



Data courtesy of Dr. Hopewell

Psychological Trauma of Local Population in Mahmudiyah Area

Presented to
3-320th Field Artillery
Forward Operating Base Mahmudiyah

Presented by
785th Medical Company
(Combat Stress Clinic)

MAJ Alan Hopewell
CPT Jeffrey Greenlinger
SSG Jay Harbeck
SGT Jeremy White

The Stress of War Never Really Changes

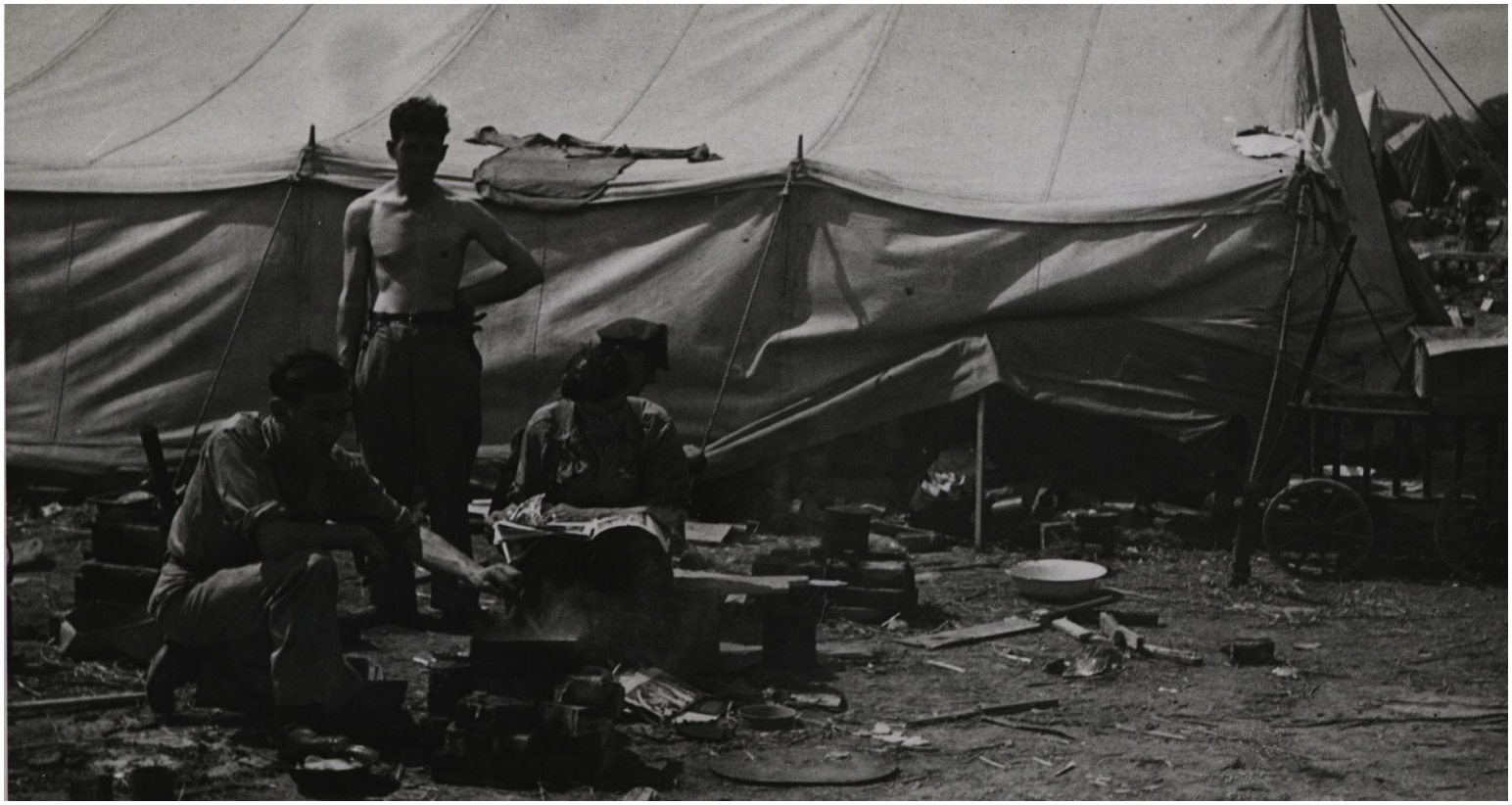
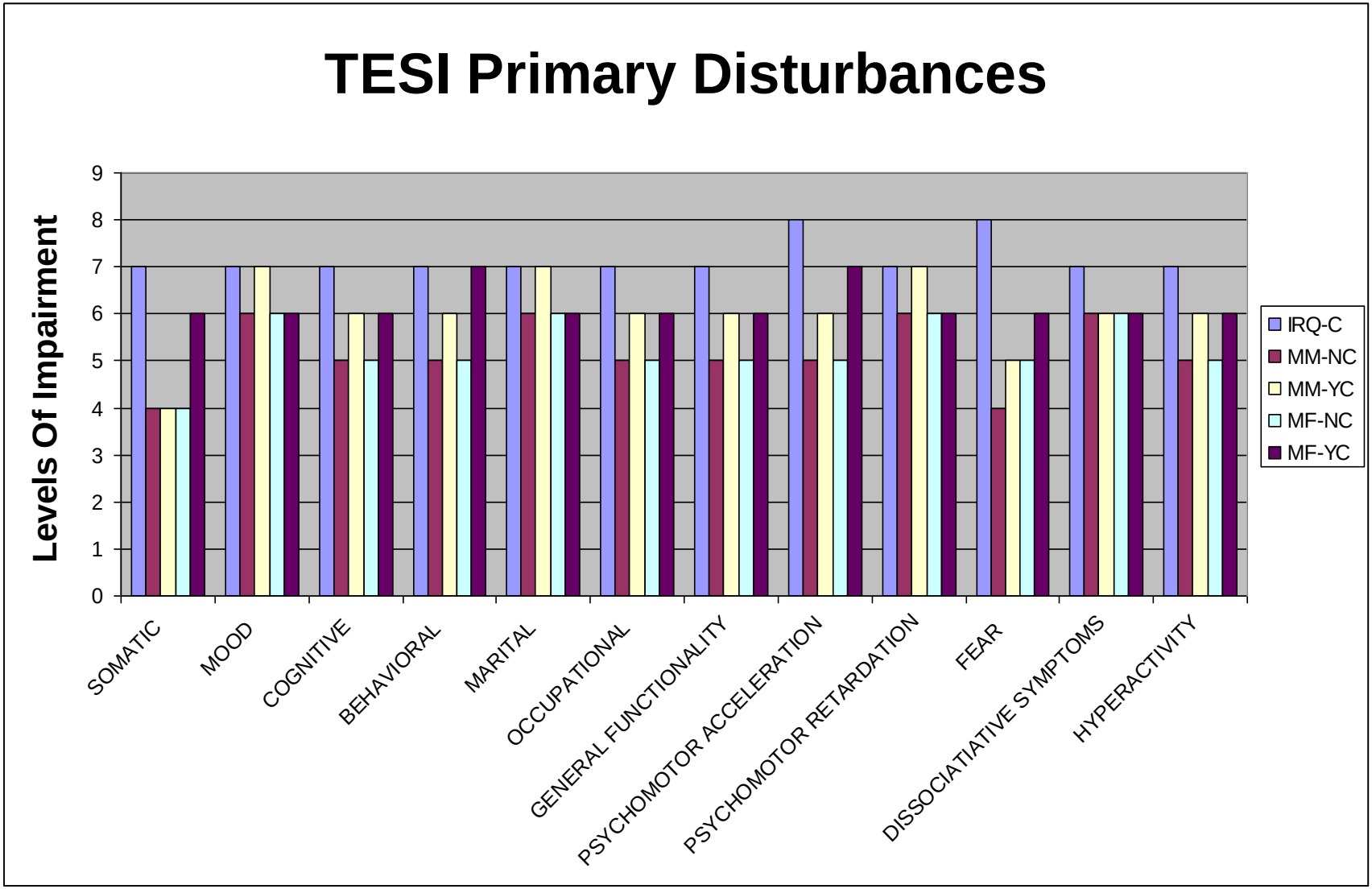


Photo courtesy McDermott Collection, United States Air Force Academy Library

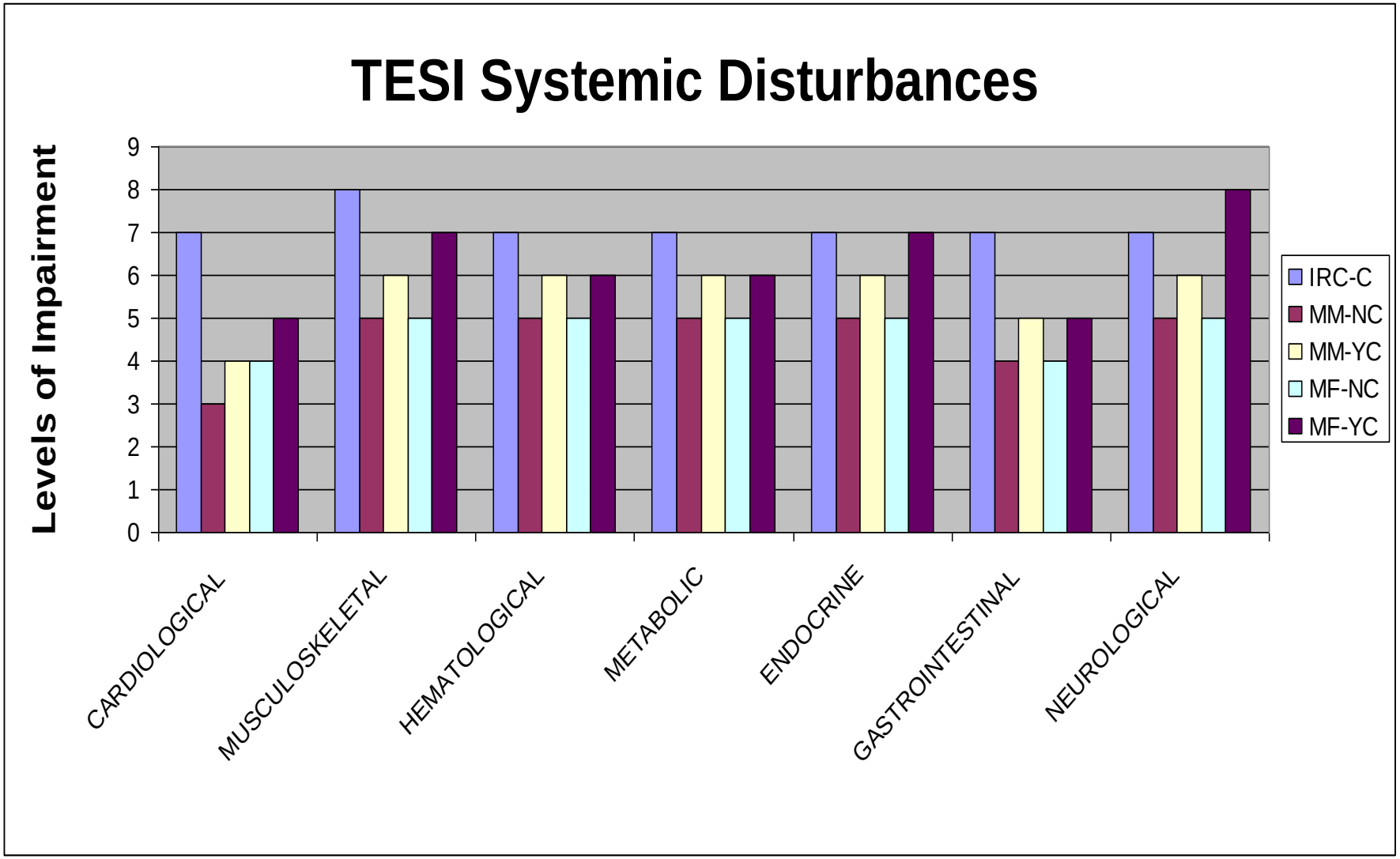
Stalag Luft VII A, 1945

Greenlinger's and Hopewell's Mission to Mahmudiyah



Data courtesy of Dr. Hopewell

Mission to Mahmudiyah



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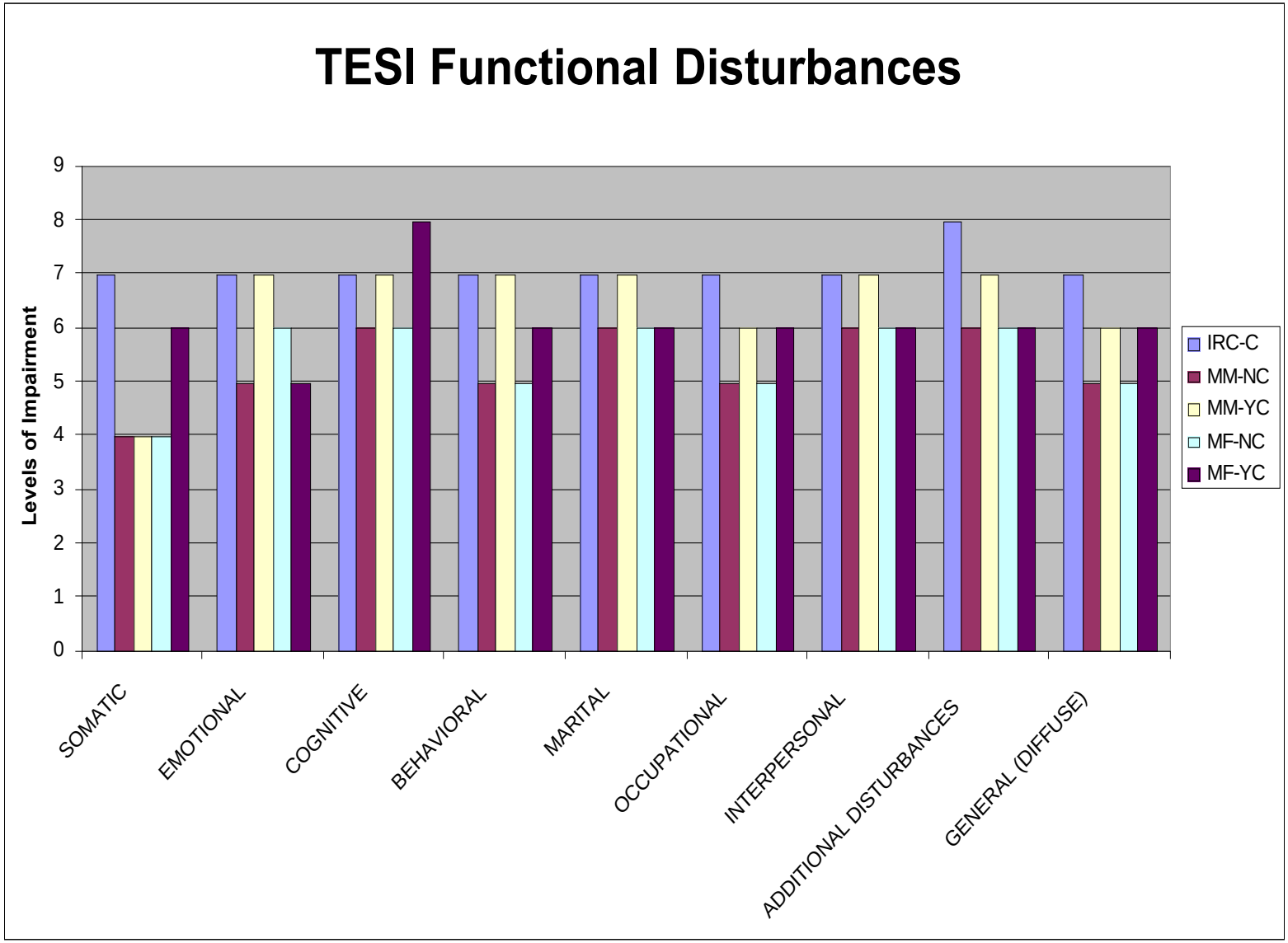
Mission to Mahmudiyah



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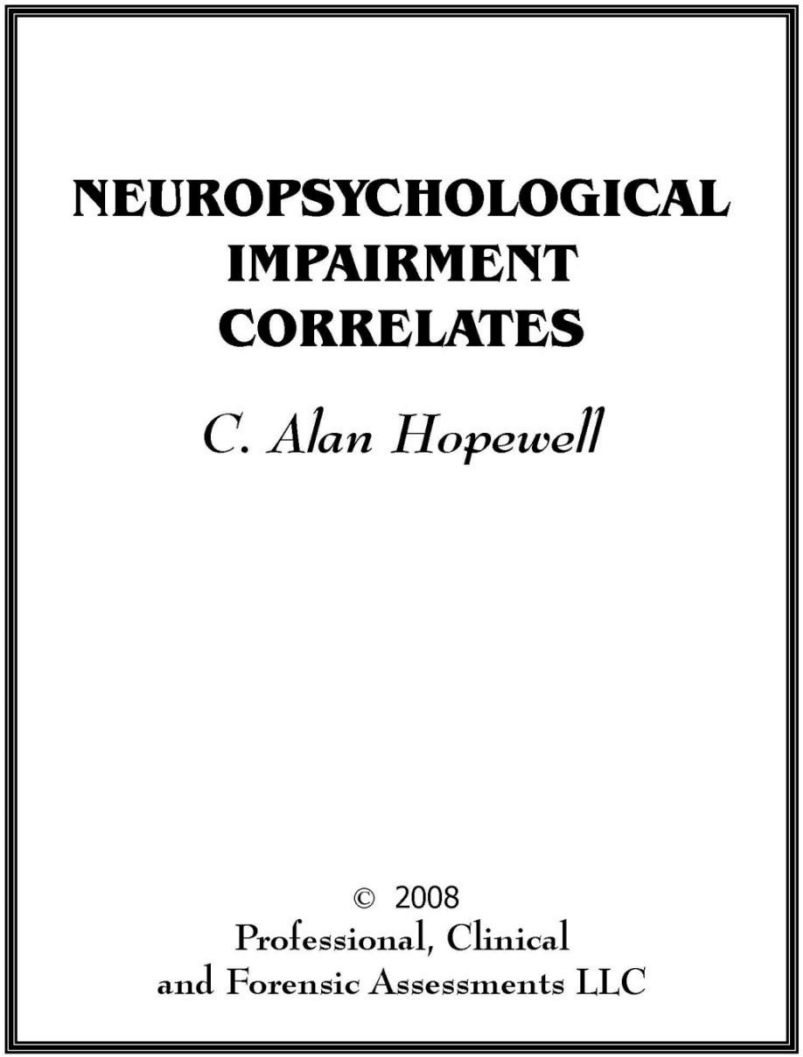
Neuropsychological Impairment Correlates



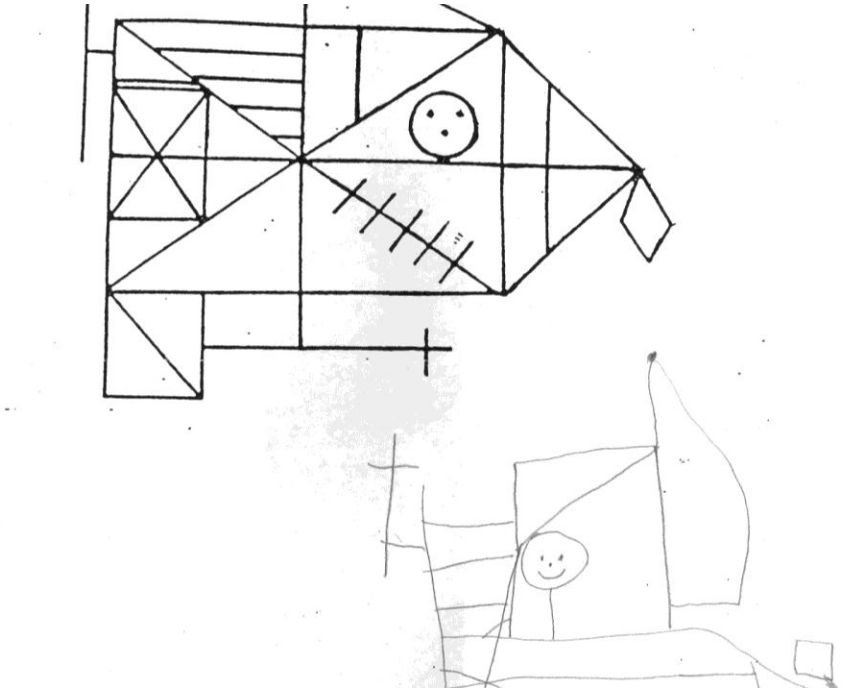
Edición Español cortesía de Daniel Muñoz y Santa Maria y Dr. Hopewell

When Stress is Significant, Consider Possible Dissimulation and Factitious Disorders

- 47 year old Anglo female civilian
- Progress notes indicated that she "landed on rear, headache, but elbows hurt."
- The record further states that she "fell onto backside of car onto the pavement."
- Proved to be a "disorder in search of a diagnosis" (and a lawsuit!)

Data courtesy of Dr. Hopewell

Delayed, Progressive Factitious Disorder

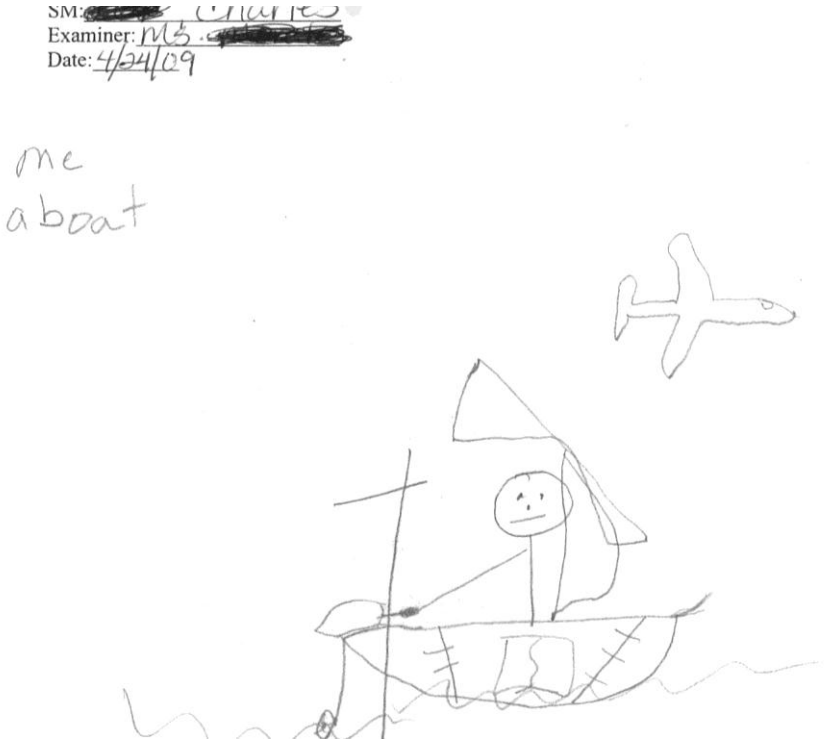


Data courtesy of Dr. Hopewell

Delayed, Progressive Factitious Disorder

- Initially, wife called clinic and was upset that soldier was being seen since “there is nothing wrong with him.”

- Within two years soldier deteriorated to wheelchair mobility and had been hospitalized x 2 and developed pseudodementia.



Data courtesy of Dr. Hopewell

Factors Suggesting Stress Manifesting into Symptom Dissimulation

- Large numbers of complaints, especially if the complaints are atypical or bizarre
- Atypical or bizarre complaints, especially regarding memory, regardless of the number endorsed
- Large numbers of health care practitioners consulted
- The existence of premorbid psychopathology
- Pseudodementia, especially if delayed or progressive (rule out genuine progressive dementias); includes exceptionally poor test performances which are at variance to levels of community functioning

Factors Suggesting Stress Manifesting into Symptom Dissimulation

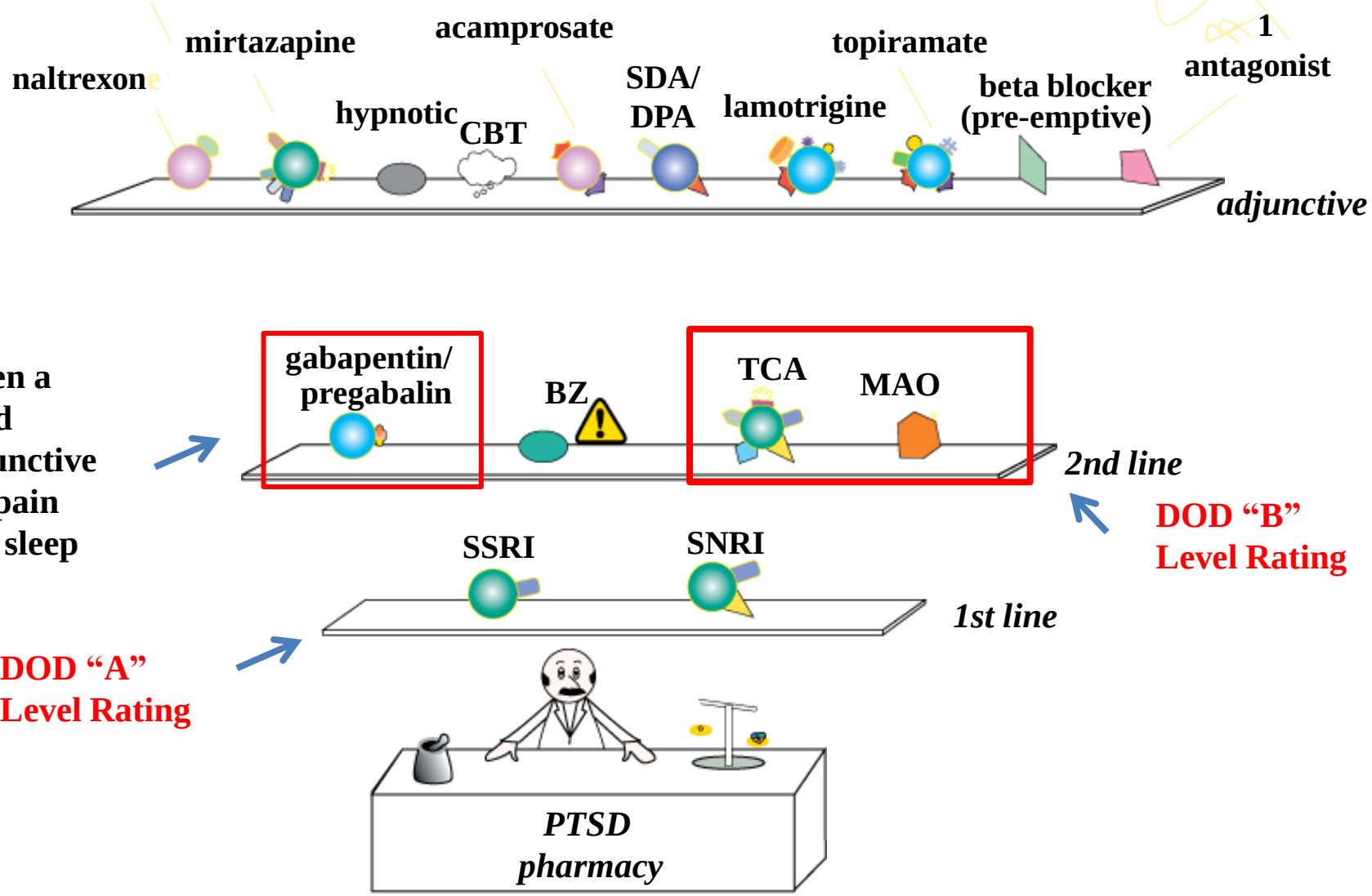
- Lack of contact with recognized head injury support resources, although substantial effects of head injury are claimed (39 ducks praying in middle of street, but not following up with recognized TBI services)
- Activities of daily living well maintained and at variance with complaints of work-related disability
- Episodic bizarre behavioral outbursts with activities of daily living being otherwise well maintained, e.g., driving
- Presence of secondary gain factors
- Pain complaints with secondary gain factors which progress to include postconcussional symptoms (Pain to brain suggests secondary gain!)

VA/DoD Working Group Consensus Development of Resilience and Recovery

- Develop a supportive, therapeutic alliance.
- Assign specific primary care provider to coordinate overall health care.
- Pharmacologic treatment
- Consider (YES!) consultation with mental health providers.
- Implement a collaborative team approach.
- VA/DoD Clinical Practice Guideline contains evidence-based psychotherapeutic and pharmacotherapeutic interventions.

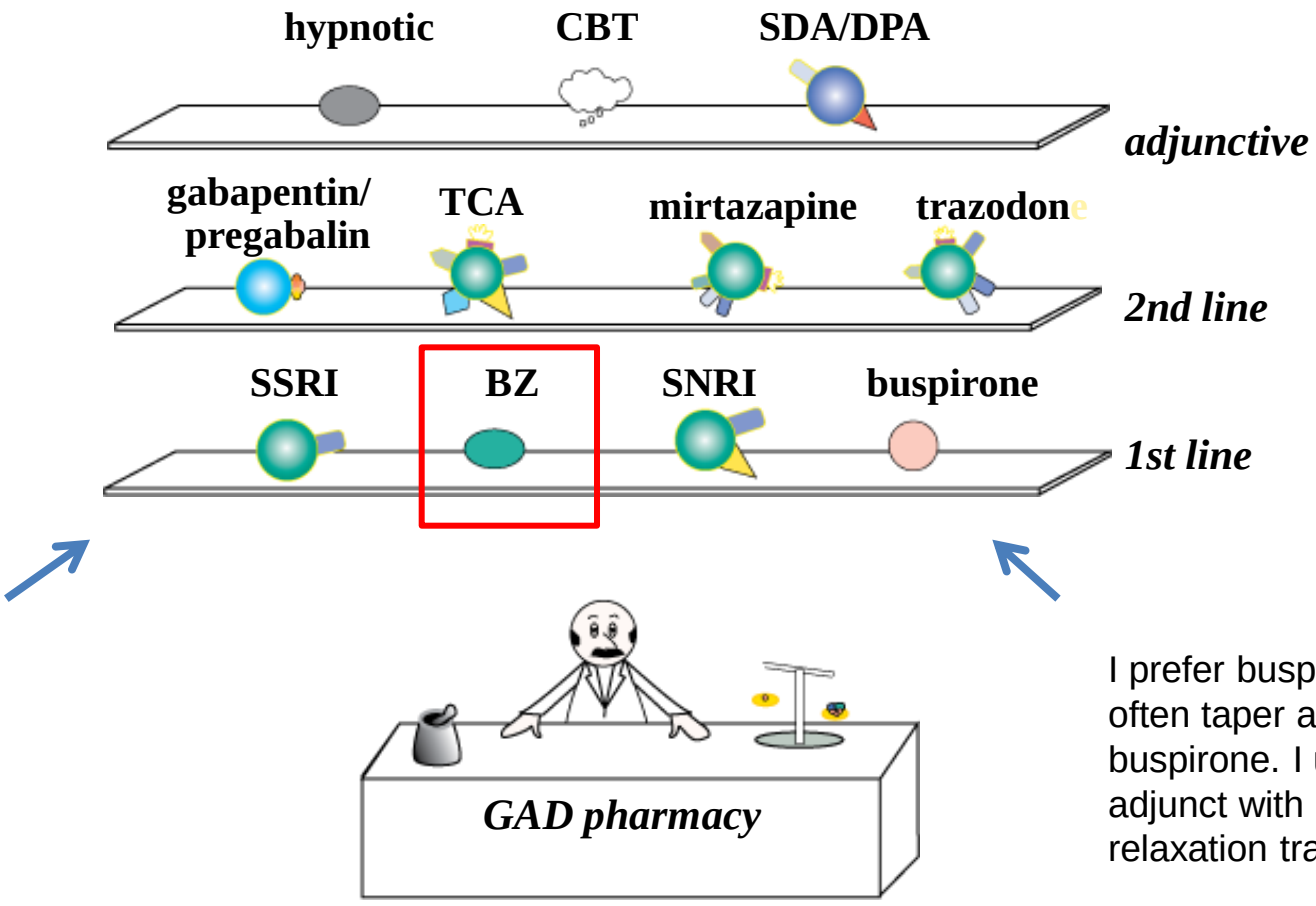
(VA/DoD, 2004)

PTSD Pharmacy



(Stahl, 2008; VA/DoD, 2004)

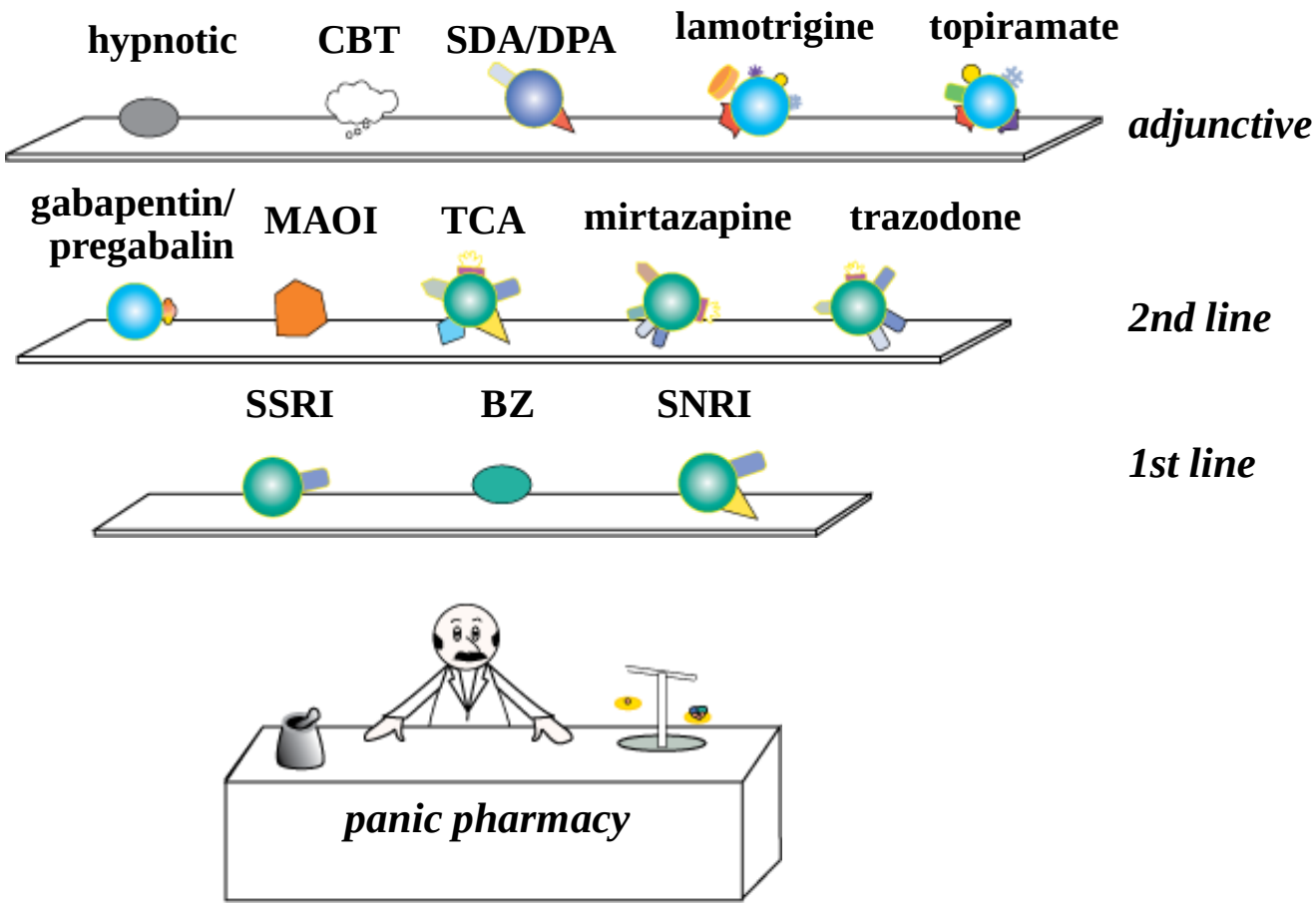
Comorbid Pharmacotherapy for PTSD + GAD



I prefer buspirone, or will often taper and switch BZ to buspirone. I usually also adjunct with biofeedback/ relaxation training.

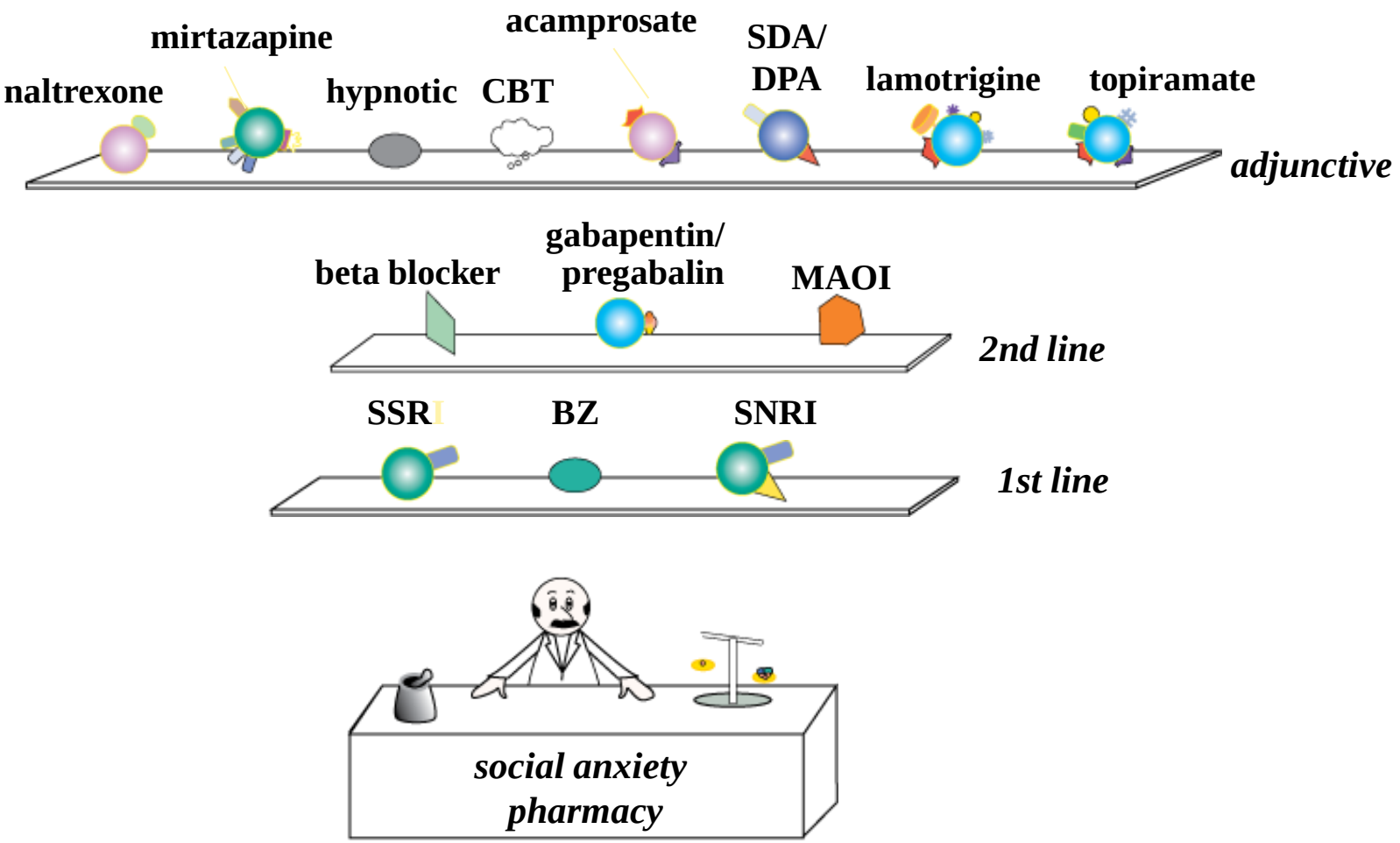
(Stahl, 2008)

Comorbid Pharmacotherapy for PTSD + Panic



(Stahl, 2008)

Comorbid Pharmacotherapy for PTSD + Social Anxiety



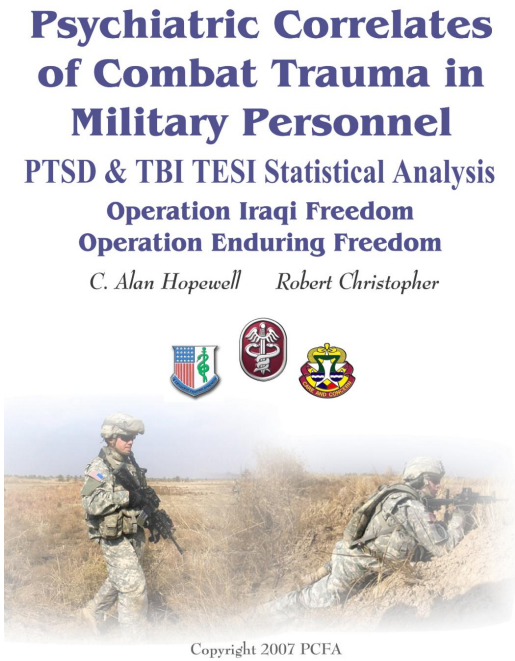
(Stahl, 2008)

Pharmaceutical Acronyms

- BZ – benzodiazepine
- CBT – cognitive behavior therapy
- DPA – dopamine 2 partial agonist
- GAD – generalized anxiety disorder
- MAOI – monoamine oxidase inhibitor
- TCA – tricyclic antidepressant
- SDA – serotonin 2a and dopamine 2 antagonist
- SSRI – selective serotonin reuptake inhibitor
- SNRI – serotonin-norephine reuptake inhibitor

Diversity Considerations

- Do not forget that with the significant ethnic as well as gender diversity in today's Armed Forces, appropriate cultural/ethnic modifications of both pharmacotherapy as well as psychotherapy are not only desirable, but essential for compliance and positive outcomes.



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(De La Cancela, V. & Hopewell, C. A., 1999)

The Real Aggie Muster Flight Team

1,401 Vietnam combat missions

Stressful enough???

Bankers
Engineers
Generals
CEOs

Not disabled victims

Photo courtesy of Texas A&M University

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DVBIC Celebrates Brain Injury Awareness Month

March 2

International Kickoff Event

TBI Educational Forum: Best Practices and Current Research (in lieu of March webinar)

March 18

Capitol Hill Brain Injury Awareness Day

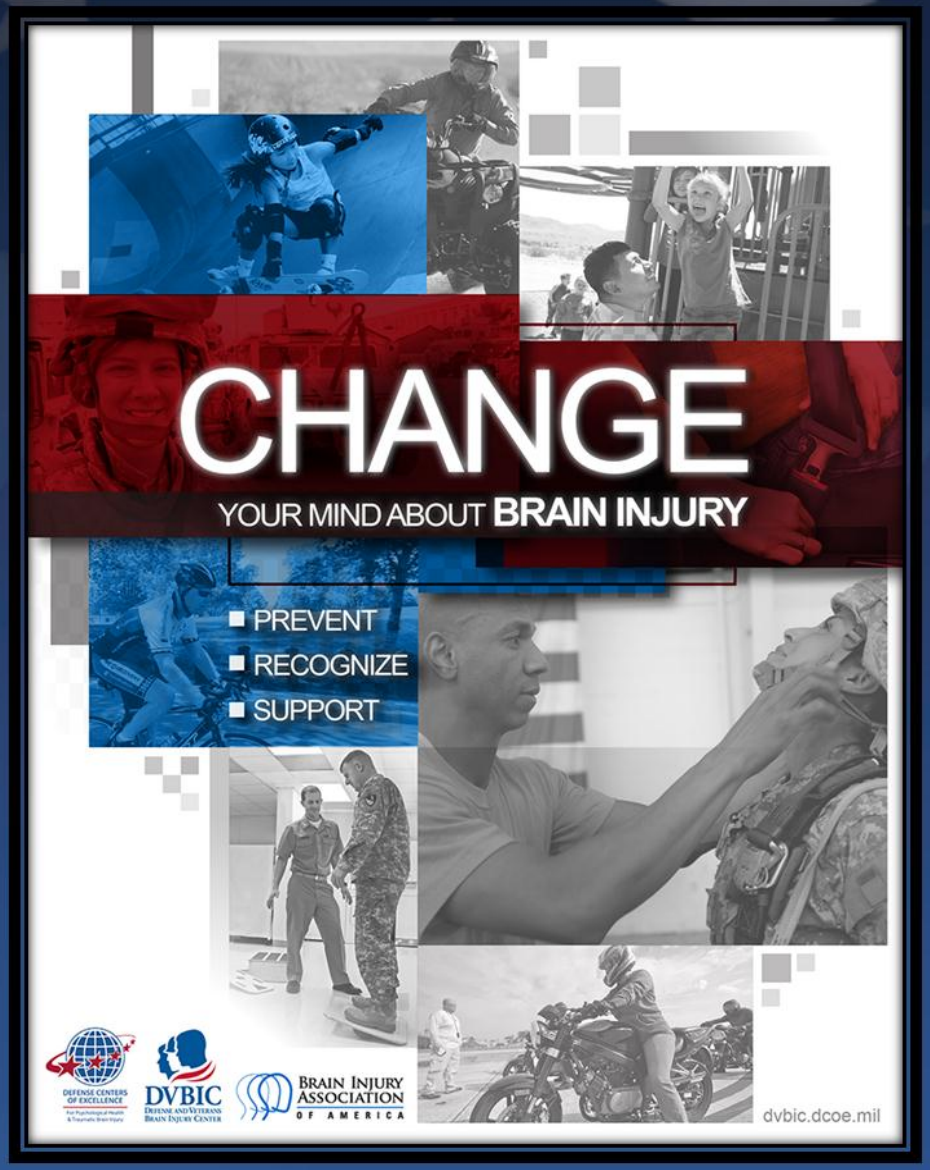
500+

Scheduled outreach events

facebook

DVBIC Facebook page launch

dvbic.dcoe.mil



Brain Injury Awareness Poster

To download or order, visit
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Traumatic Brain Injury Educational Forum: Best Practices and Current Research
Mar. 2, 2015
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