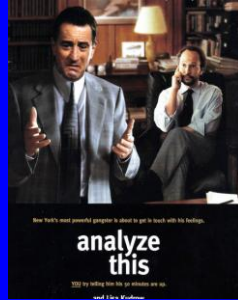




Older Adults and Veterans
TBI and Neurocognitive Disorders
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Disclosure



The presenter DOES NOT have an interest in selling a technology, program, product, and/ or service to CME/ CE professionals.

www.aoaam.org

www.biausa.org

www.dvbjc.org

www.ptsd.va.gov

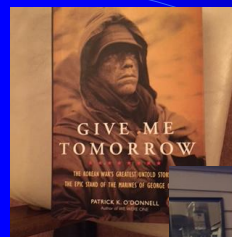
www.NeuroRestorative.com

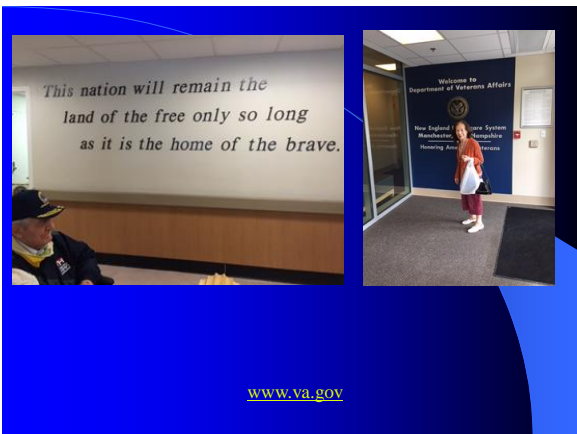
Our Objectives



- 1) Discuss DSM 5 Neurocognitive Disorders to include TBI and substance-induced neurocognitive disorders
- 2) Assess our understanding of the structure and function of neurocognitive disorders

This lecture supports the www.whitehouse.gov/joiningforces initiative.





The neurocognitive disorders referred to in the DSM IV as “Dementia, Delirium, Amnestic, and other Cognitive Disorders begin with delirium”.

Delirium is defined as a temporary confusion caused by underlying medical problems, **drug toxicity** or environmental factors.

Delirium does not involve structural brain damage.

Individuals may completely improve from delirium if the medical problem is identified and treated.

www.alzfdn.org/AboutDementia/delirium_pr.html

ASAM Definition of Addiction

“Addiction is a primary, **chronic** disease of brain reward, motivation, memory and related **circuitry**. Dysfunction in these **circuits** leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in the individual pursuing reward and/or relief by substance use and other behaviors”.

“Addiction is characterized by impairment in behavioral **control**, **craving**, inability to **consistently** abstain, and diminished recognition of significant problems with one’s behaviors and interpersonal relationships”.

Dementia is a progressive decline in memory and at least one other cognitive area in an alert person. In order to make a diagnosis of dementia, delirium must be ruled out.

D Dementia
E Electrolyte disorders
L Lung, liver, heart, kidney, brain
I Infection
R Rx Drugs
I Injury, Pain, Stress
U Unfamiliar environment
M Metabolic

www.hopkinsmedicine.org

Major and Mild Neurocognitive Disorders

Diagnostic Criteria:

- Cognitive decline from a previous level of performance in one or more cognitive domains (complex attention, executive function, learning and memory, language, perceptual-motor, or social cognition)
- Cognitive deficits +/- interfere with independence in everyday activities
- Cognitive deficits do not occur exclusively in the context of a delirium

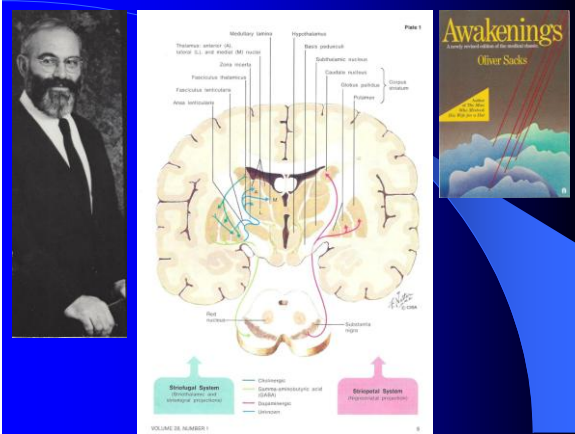
Major and Mild Neurocognitive Disorders

Diagnostic Criteria Cont.

D. Cognitive deficits are not better explained by another mental disorder (MDD, schizophrenia)

Specify whether due to:

| | |
|-----------------------------------|--------------------------|
| Vascular Disease | Traumatic Brain Injury |
| Alzheimer’s Disease | Substance/Medication Use |
| Frontotemporal Lobar Degeneration | Parkinson’s Disease |
| Lewy Body Disease | Huntington’s Disease |
| HIV Infection | Prion Disease |
| Another Medical Condition | Unspecified |
| | Multiple Etiologies |



Neurocognitive Domains

- Complex Attention
 - Sustained Attention
 - Selective Attention
 - Divided Attention
- Executive Function
 - Planning
 - Decision Making
 - Working Memory
 - Feedback/ Error Utilization
 - Overriding Habits/ Inhibition
 - Mental/ Cognitive Flexibility

Simplified Brain Behavior Relationships

Brain Power = Energy
Time

Neurocognitive Domains

- Learning and Memory
 - Immediate Memory
 - Recent Memory
- Language
 - Expressive Language
 - Grammar and Syntax
 - Receptive Language

General Patterns of Dysfunction by Location of Injury

| Right Side of Brain | Left Side of Brain | Diffuse Injury |
|---|---|--|
| <ul style="list-style-type: none"> Impairments in visual-spatial perception Left-neglect, or inattention to the left side of space or body Decreased awareness of deficits Altered creativity and music perception Loss of the greatest, or "big picture" Visual memory deficits Decreased control over left-sided movements | <ul style="list-style-type: none"> Difficulties in understanding language (receptive language) Difficulties in speaking or verbal output (expressive language) Catastrophic reactions (depression, anxiety) Verbal memory deficits Decreased control over right-sided movements Impaired logic Sequencing difficulties | <ul style="list-style-type: none"> Reduced thinking speed Increased confusion Reduced attention and concentration Increased fatigue Impaired cognitive functions across all areas |

P = I x V

Neurocognitive Domains

- Perceptual-Motor
 - Visual Perception
 - Visuoconstructional
 - Perceptual- Motor
 - Praxis
 - Gnosis
- Social Cognition
 - Recognition of Emotions
 - Theory of Mind

Partial Recovery of Brain Dopamine Transporters in Methamphetamine (METH) Abuser After Protracted Abstinence

V = I x R
BP = CO x TPR

Severity Rating for TBI

Traumatic Brain Injury Description

| Severity | GCS | AOC | LOC | PTA |
|----------|-------|---------|-------------------|-------------------|
| Mild | 13-15 | ≤24 hrs | 0-30 min | ≤24 hrs |
| Moderate | 9-12 | >24 hrs | >30min <24 hrs | >24hrs <7 days |
| Severe | 3-8 | >24hrs | ≥24 hrs | ≥7 days |

GCS- Glasgow Coma Score AOC- Alteration in consciousness
LOC -Loss of consciousness PTA- Post-traumatic amnesia

www.dvbic.org

| MOI | Glasgow Coma Scale | |
|------------------|-----------------------------|---|
| LOC | Eye opening | |
| AVPU | spontaneous | 4 |
| | to speech | 3 |
| | to pain | 2 |
| | no response | 1 |
| Primary Survey | Verbal response | |
| ABCDE | alert and oriented | 5 |
| | disoriented conversation | 4 |
| | speaking but nonsensical | 3 |
| | moans/unintelligible sounds | 2 |
| | no response | 1 |
| Secondary Survey | Motor response | |
| | follows commands | 6 |
| | localizes pain | 5 |
| | withdraws from pain | 4 |
| | decorticate flexion | 3 |
| | decerebrate extension | 2 |
| | no response | 1 |

Source: Heegaard VVG and Biros MH (see Suggested Reading)

TBI: Etiology

Civilian population

- 50% vehicular
- 20% falls
- 20% assaults/ violence
- 10% sports



Figure 1.3 Raccoon Eyes

Ecchymosis in the periorbital area, resulting from bleeding from a fracture site in the anterior portion of the skull base. May also be caused by basal fractures. (Courtesy of Frank Blyskal, MD)



Figure 1.4 Hemotympanum


Seen in a basilar skull fracture when the fracture line extends into the middle ear, resulting in bleeding into the middle ear. Blood can be seen behind the tympanic membrane. (Courtesy of Richard A. Clark, MD, PhD)



Figure 1.5 Cerebrospinal Fluid Leak

This example, from the nose, can be difficult to distinguish if blood is mixed. The distinctive haloing sign, seen here, and green blood (earrings) and CSF (earrings) help. The stability sign has been questioned. (Courtesy of David W. Nelson, MD)

Differential Diagnosis of Closed Head Injury



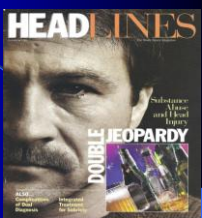
▶ A 47-year-old woman presented after hitting the windshield in a motor vehicle accident.

- Epidural hematoma
- Subdural hematoma
- Intracerebral hematoma
- Intracerebral contusion
- Subarachnoid hemorrhage
- Cerebral concussion
- Malignant brain edema syndrome
- Second-impact syndrome
- Cervical spine injury

Treating the Head Injured Substance Abuser

Alcohol's Effects

- ❑ Lower level of consciousness
- ❑ Longer coma
- ❑ Longer stay in hospital
- ❑ Longer period of agitation in coma, which slows recovery process
- ❑ Lower cognitive status at discharge
- ❑ Increased likelihood of high number of memory defects



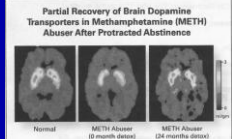
Rancho Los Amigos TBI Scales

| | |
|------------------|--|
| Level I | No Response No response to pain, touch, sound, or sight |
| Level II | Generalized Response Reflex response to pain |
| Level III | Localized Response Responds to physical discomfort, blinks to strong light, turns toward/away from sound, inconsistent response to commands |
| Level IV | Confused - Agitated Alert, very active, aggressive or bizarre behaviors, performs motor activities but behavior is non-purposeful, extremely short attention span |
| Level V | Confused - Non-Agitated Grossly attends to environment, highly distractible, needs continuous re-direction; difficulty learning new tasks; agitated by too much stimulus; May engage in social conversation but with inappropriate wording |
| Level VI | Confused - Appropriate Inconsistent orientation to time/place; retention span/recent memory impaired; begins to recall past; Consistently follows simple directions |
| Level VII | Automatic - Appropriate Performs daily routine in highly familiar environment in non-confused but automatic robot-like manner; skills noticeably deteriorate in unfamiliar environment |


Addiction

“a chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences. It is considered a brain disease because drugs change the brain- they change its structure and how it works. These brain changes can be long lasting, and can lead to the harmful behaviors seen in people who abuse drugs”.


-National Institute on Drug Abuse



Risk



Benefit



MVA Trauma

MOI MOA CB1 CB2

LOC AVPU Dose


A

B

C

D

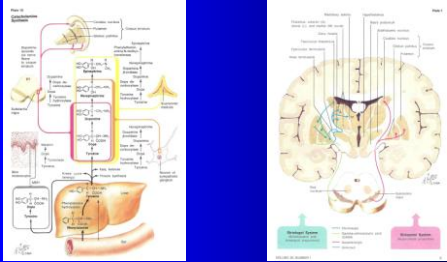
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Mechanism of Action: Inhibition of Neurotransmitter Release

CB1 Central & Peripheral Nervous System

CB2 Non-neuronal Tissue & Spinal Cord



Cannabis Use Disorder DSM-5

Diagnostic Criteria

A. A problematic pattern of cannabis use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period:

1. Cannabis is often taken in larger amounts or over a longer period than was intended.
2. There is a persistent desire or unsuccessful efforts to cut down or control cannabis use.
3. A great deal of time is spent in activities necessary to obtain cannabis, use cannabis, or recover from its effects.
4. Craving, or a strong desire or urge to use cannabis.

Cannabis Use Disorder DSM-5

Diagnostic Criteria

5. Recurrent cannabis use resulting in a failure to fulfill major role obligations at work, school, or home.
6. Continued cannabis use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis.
7. Important social, occupational, or recreational activities are given up or reduced because of cannabis use.
8. Recurrent cannabis use in situations in which it is physically hazardous.

Cannabis Use Disorder DSM-5

Diagnostic Criteria

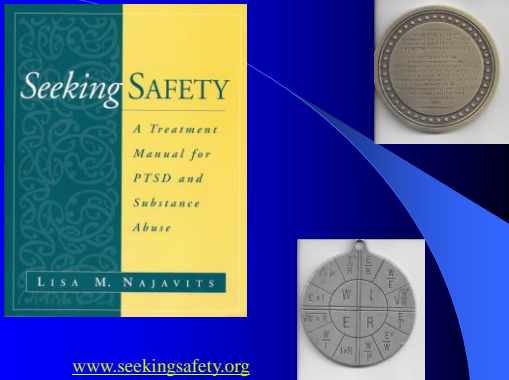
9. Cannabis use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis.
10. Tolerance, as defined by either of the following:
 - a. A need for markedly increased amounts of cannabis to achieve intoxication or desired effect.
 - b. Markedly diminished effect with continued use of the same amount of cannabis.
11. Withdrawal, as manifested by either of the following:
 - a. The characteristic withdrawal syndrome for cannabis.
 - b. Cannabis (or a closely related substance) is taken to relieve or avoid withdrawal symptoms.

Seeking SAFETY

A Treatment Manual for PTSD and Substance Abuse

LISA M. NAJAVITS

www.seekingsafety.org



Concluding Dialogue:

Is there value in exploring structure and function in the differential diagnosis of Neurocognitive Disorders?