National Coalition on Mental Health and Aging and
National Council on Aging
Present

Traumatic Brain Injury and Mental Illness Among Older Adults:

The Problem and New Management Approaches

March 26, 2020

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National Coalition on Mental Health & Aging

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NCMHA
National Coalition on Mental Health & Aging

Mission:

To provide opportunities for professional, consumer and government organizations to work together towards **improving the availability and quality of mental health preventive and treatment strategies** to older Americans and their families through education, research and increased public awareness.

Visit: www.ncmha.org

NCMHA
National Coalition on Mental Health & Aging

History, Membership and Activities:

- Formed in 1991 by a group of organizations from the aging and mental health fields
- Comprised of 100 national and state associations, state coalitions, and governmental agencies, e.g., SAMHSA and ACL.
- Co-sponsor events to highlight challenges of mental health and aging
- Identify new approaches to addressing problems.

Webinar Series on "Addressing Disparities in Behavioral Health Care for Older Adults"

- Following the May 20th **National Older Adult Mental Health Awareness Day (OAMHD)** events, NCMHA developed a plan to collaborate with interested government agencies, private sector groups, and experts to maintain the momentum and recommendations generated from OAMHD.

- A series of webinars during 2019/2020 that **target specific topics with a practical focus and accompanying tools/resources** to address the needs of older adults with mental health conditions, as well as state/local efforts/best practices.

- A special feature of the webinars will be that the sessions will coincide with **monthly, weekly and daily national mental health or aging observances**.

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Key Objectives of the Webinar Series

- **Identify specific approaches that address disparities in behavioral health care for older adults**
- Ensure that older adults with mental health and addiction-related conditions are **integrated within all MH awareness raising, policy, programmatic and research efforts going forward**.
- **Raise awareness among primary care, mental health, other health service providers and the aging network** about the impact of suicide, opioid use, and interrelated problems, and impact provider practice patterns for older adults.
- Identify **specific tools such as geriatric assessment, questions** – suicide ideation, firearm presence, opioid use and other screening tools – and detailed guidance.

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Webinar Series Roll Out – 2019-2020

August 21 (12:00 PM EDT) – Senior Citizen's Day

"Prevention and Health Promotion for Late-Life Mental Health Disorders"

September 18 (12 PM EDT) – Suicide and Healthy Aging Month

"Strategies for Reducing Suicide in Older Adults"

October 10 (2:00 PM EDT) – World Mental Health Day

"Home & Community-Based Mental Health Services: Meeting the Needs of Older Adults"

November 13 – Family Caregivers and Alzheimer's Awareness Month

"The Invisible Health Care Provider: Family Caregivers of Individuals with Dementia"

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Webinar Series Roll Out – 2019-2020

January 23, 2020 (12:00 PM EST) – Mental Health Wellness Month

"Solutions to Behavioral Health Workforce Shortages & Lack of Funding"

February 27 (2:00 PM EST) – Eating Disorders and Mental Health Month

"Bridging the Science-Practice Gap: Potential Opportunities for Geriatric Mental Health"

March 26 (3:00 PM EDT) – National Brain Injury Awareness Month

"Traumatic Brain Injury and Mental Illness Among Older Adults: The Problem and New Management Approaches"

April 7, 2020 (12:00 PM EDT) – National Public Health Week and World Health Day

"Social Determinants of Mental Health for Older Adults: A New Perspective"

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Today's Webinar

In recognition of National Brain Injury Awareness Month:

"Traumatic Brain Injury and Mental Illness Among Older Adults: The Problem and New Management Approaches"

Presenter: Matthew Peters, M.D.

Matthew Peters, M.D., is Assistant Professor at Johns Hopkins University School of Medicine. Dr. Peters is an active clinician, teacher, and researcher, and sees patients in the Acquired Brain Injury Clinic and Memory and Alzheimer's Treatment Center at Johns Hopkins Bayview. He has been internationally recognized for his research work and has received research funding from the National Institutes of Health, Department of Defense, and National Alzheimer's Coordinating Center.

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Presented by: Matthew E. Peters, MD
March 25, 2020

Traumatic Brain Injury in Older Adults

The Problem and New Management Approaches

Relevant Disclosures

- Funding from NIA, DoD, NACC

Outline

- What is a Neuropsychiatric Symptom?
- New TBI in the Aged
- Aging with a TBI
- A Focused Clinical Approach
- Geriatric Approach to TBI Research

Sources

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International Psychogeriatrics (2016), 28:12, 1931–1934 © International Psychogeriatric Association 2016
doi:10.1017/S1041610216001666

GUEST EDITORIAL

Traumatic brain injury (TBI) in older adults: aging with a TBI versus incident TBI in the aged

Editorial
For reprint orders, please contact: reprints@futuremedicine.com

Concussion

Traumatic brain injury in older adults: do we need a different approach?

Matthew E Peters*,[1] & Raquel C Gardner[2,3]

The Growing Epidemic of TBI in Older Patients

May 1, 2019

By Bharat R. Narapareddy, MD, Lisa N. Richey and Matthew E. Peters, MD

Despite advances in neurology, a silent epidemic of older adults who sustain a TBI is growing. The authors provide tools and tips for a geriatric approach to treatment.

Neuropsychiatric Symptoms

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Neuropsychiatric Symptoms

Definition

- "Non-cognitive" symptoms occurring with brain pathology (aging / dementia)
  - Delusions
  - Hallucinations
  - Agitation / Aggression
  - Depression / Dysphoria
  - Anxiety
  - Elation / Euphoria
  - Apathy / Indifference
  - Disinhibition
  - Irritability / Lability
  - Aberrant Motor Behavior
  - Sleep Disturbances
  - Appetite and Eating Disturbances

Neuropsychiatric Symptoms

Difference from Idiopathic Syndromes

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- Neuropsychiatric symptoms are viewed differently than psychiatric symptoms starting earlier in life
- Idiopathic psychiatric syndromes can be lifelong
- If the presentation of an idiopathic syndrome changes with time, brain pathology may be involved

Neuropsychiatric Symptoms

Focus on Dementia

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- Essentially universal in dementia
- Associated with:
  - Faster cognitive decline
  - Accelerated progression to severe dementia and death
  - Greater caregiver stress
  - Lower quality of life
  - Higher neuropathological markers of dementia

Neuropsychiatric Symptoms

Theoretical Causes in Dementia

- **Symptom Hypothesis**
  - NPS are a result of neurodegenerative changes
  - NPS a symptom of dementia
- **Risk Factor Hypothesis**
  - Concurrent non-dementia pathology that lowers the brain's reserve for neurodegenerative pathology
  - NPS are part of a separate process
- **Unmet Needs Model**
  - Individual is unable to meet his/her own needs
  - Caregivers have insufficient knowledge/ability to do so
  - Most relevant for severe dementia

Traumatic Brain Injury (TBI)

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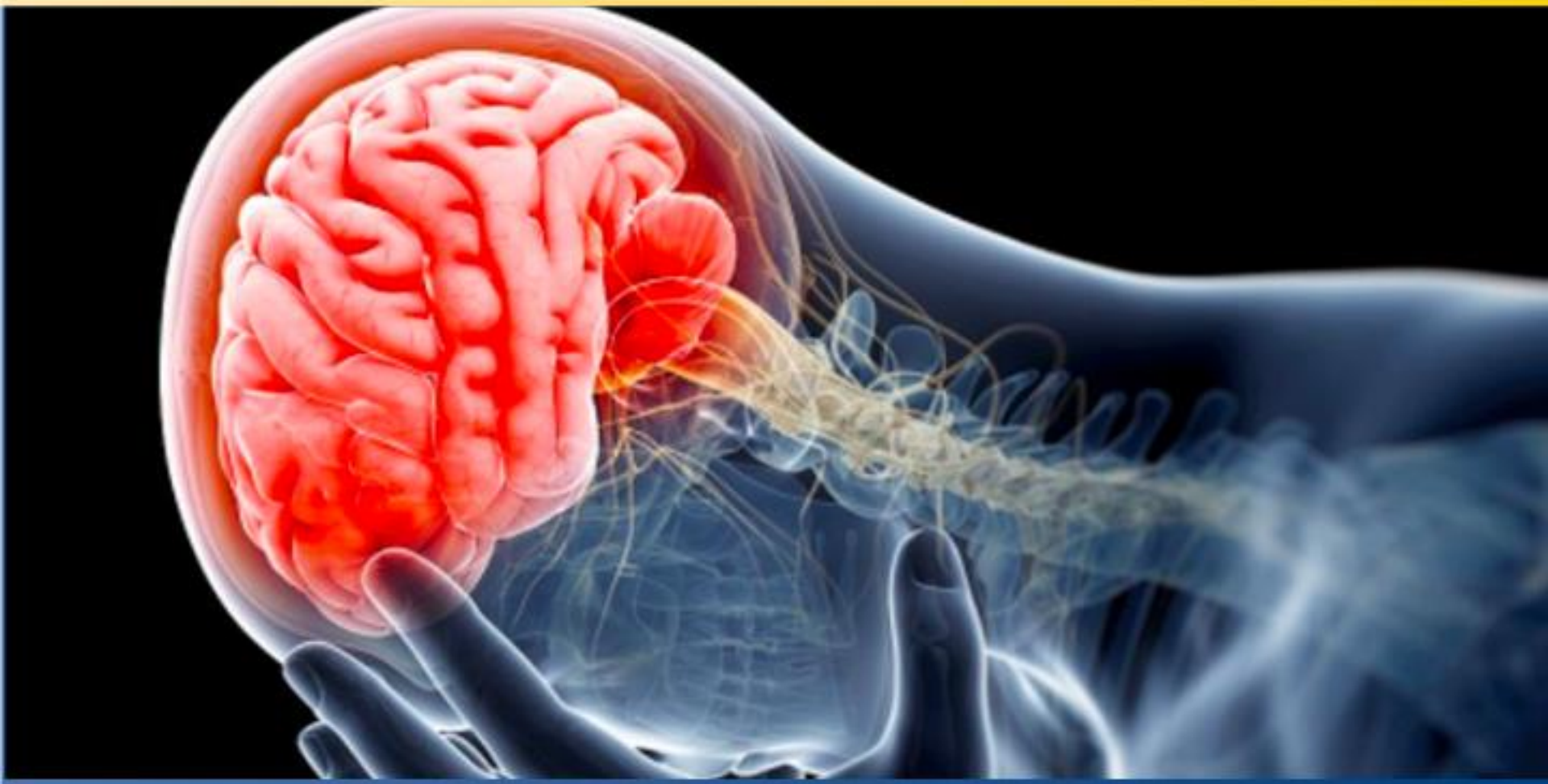

A Focus on TBI
Finite Capacity

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- The brain has a finite capacity for recovery and adaptation
  - Both TBI recovery and aging utilize the same plasticity mechanisms
  - Alters the handling of normal aging

New TBI in the Aged

Overview Statistics

- ~20 million emergency room visits
  - 61% increase from prior years
- Rising levels of hospitalizations and death
  - 75 years and older, highest number of TBIs

New TBI in the Aged

Geriatric Specific Factors

- Mechanism of injury – falls
  - Risk of repetitive TBI
- Female > Male
- Pre-existing medical conditions
  - e.g., anti-coagulant use

New TBI in the Aged

Geriatric Specific Factors

- Increased risk of intracranial bleeding
  - Dura adherence, bridging vein fragility, cerebrovascular atherosclerosis
- Normal neurological examination despite intracranial bleed

New TBI in the Aged

HeadSMART

Table 1.

Baseline demographic comparison of older vs. younger individuals with blunt head trauma.

Characteristics[a]	Younger: age <65 (*n* = 391)	Older: age ≥65 (*n* = 109)	Statistic[b]	*p*-Value
Age, median in years (IQR)	37 (26–51)	75 (70–81)	255.204	<0.001
Sex				
Male	252 (64.5)	44 (40.4)	20.4681	<0.001
Female	139 (35.5)	65 (59.6)		
Race				
Black	187 (47.8)	17 (15.6)	49.0981	<0.001
White	171 (43.7)	89 (81.7)		
Other	33 (8.5)	3 (2.7)		

New TBI in the Aged

HeadSMART

Table 1.

Baseline demographic comparison of older vs. younger individuals with blunt head trauma.

Characteristics[a]	Younger: age <65 (*n* = 391)	Older: age ≥65 (*n* = 109)	Statistic[b]	*p*-Value
Highest level of education				
Less than high school	70 (17.9)	24 (22.0)	2.5191	0.276
High school graduate	234 (59.8)	56 (51.4)		
College graduate	87 (22.3)	29 (26.6)		
Married	107 (27.4)	45 (41.3)	7.8045	0.007
Employed	234 (59.8)	16 (14.7)	69.5582	<0.001
Prior concussion	125 (32.0)	24 (22.0)	4.0347	0.045
Mood disorder	112 (28.6)	40 (36.7)	2.8437	0.296
Non-mood psychiatric disorder	81 (20.7)	18 (16.5)	1.2508	0.488

New TBI in the Aged

HeadSMART

Table 2.

Injury descriptor comparison of older vs. younger individuals with blunt head trauma.

Characteristics[a]	Younger: age <65 (*n* = 391)	Older: age ≥65 (*n* = 109)	Statistic[b]	*p*-Value
Mechanism of injury				
Pedestrian struck	46 (11.8)	4 (3.7)	79.4018	<0.001
Motor vehicle-traffic	105 (26.9)	21 (19.3)		
Fall	100 (25.6)	76 (69.7)		
Assault	83 (21.3)	3 (2.8)		
Struck by/against	21 (5.2)	3 (2.8)		
Pedal cycle	36 (9.2)	2 (1.7)		
Intoxicated on drugs/alcohol	94 (24.0)	12 (11.0)	8.6652	0.002
Abnormal CT findings	65 (16.6)	27 (24.8)	3.7677	0.068

New TBI in the Aged

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Table 2.

Injury descriptor comparison of older vs. younger individuals with blunt head trauma.

Characteristics[a]	Younger: age <65 (n = 391)	Older: age ≥65 (n = 109)	Statistic[b]	p-Value
Symptoms at time of presentation				
GCS < 15 at presentation	61 (15.6)	12 (11.0)	1.4414	0.283
Post-traumatic amnesia	221 (56.5)	52 (47.7)	3.0436	0.226
Deficits in short-term memory	54 (13.8)	14 (12.8)	0.9925	0.511
Focal neurological deficits	33 (8.4)	5 (4.6)	2.0996	0.392
Headache	329 (84.1)	76 (69.7)	12.1865	0.002
Vomiting since injury	43 (11.0)	9 (8.3)	0.6870	0.481
GOAT total score, median (IQR)	99 (94–100)	99 (92–100)	0.109	0.7408
Met VA/DoD criteria	302 (77.2)	63 (57.8)	16.3428	<0.001

New TBI in the Aged

Outcomes

- On average,
  - Higher morbidity and mortality
  - Slower recovery trajectories
  - Greater functional dependence
  - Increased risk of dementia
- Risk of new onset depression, anxiety, and/or PTSD

New TBI in the Aged

Outcomes

- However, there may be a subset of older individuals who achieve outcomes similar to, or better, than younger individuals
  - Chronological age and TBI severity are not the sole determinants of outcome

New TBI in the Aged

HeadSMART

Table 3. One, Three, and Six Month Outcomes in Older vs. Younger Participants with Mild Traumatic Brain Injury.

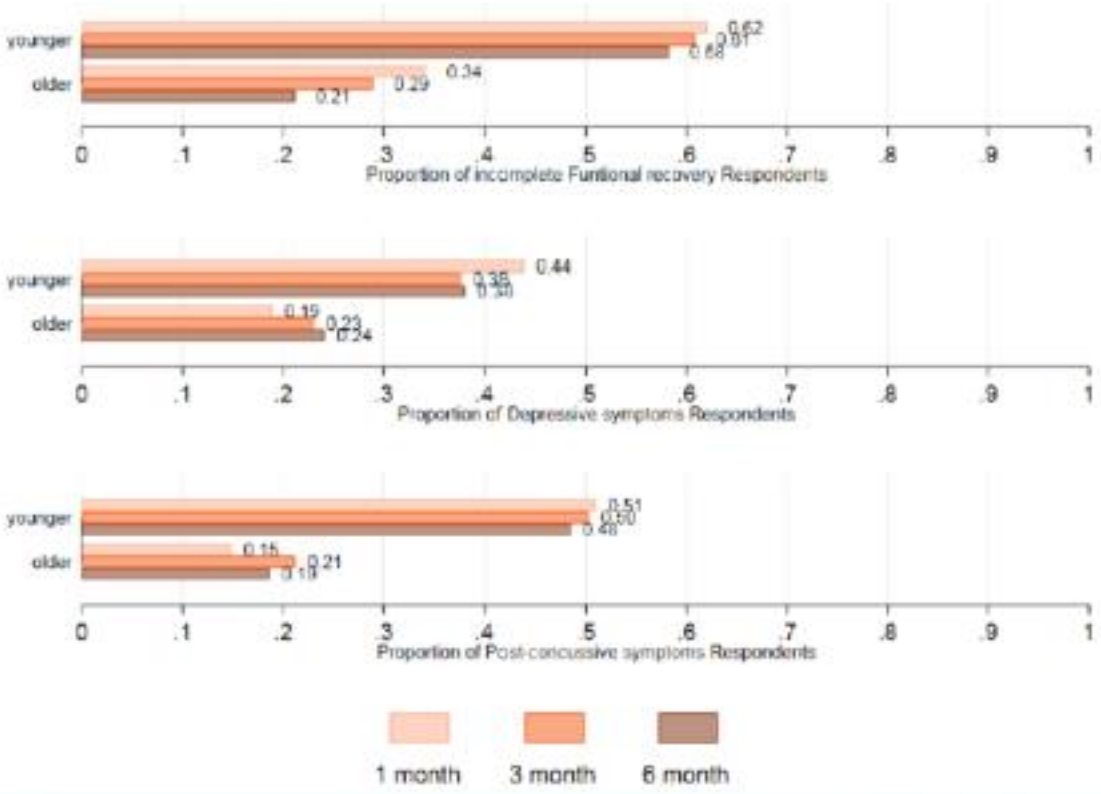
Outcome	ONE MONTH		THREE MONTHS		SIX MONTHS	
	Younger: Age <65	Older: Age ≥65	Younger: Age <65	Older: Age ≥65	Younger: Age <65	Older: Age ≥65
Incomplete Functional Recovery, No. (%)[1]	160/258 (62.0%)	26/76 (34.2%)	146/240 (60.8%)	20/69 (29.0%)	131/225 (58.2%)	14/66 (21.2%)
Post-Concussive Symptoms[2]	132/259 (51.0%)	11/74 (14.9%)	120/239 (50.2%)	14/66 (21.2%)	107/221 (48.4%)	11/59 (18.6%)
Depressive Symptoms[3]	113/258 (43.8%)	14/74 (18.9%)	90/239 (37.7%)	15/65 (23.1%)	83/218 (38.1%)	14/58 (24.1%)

1. Incomplete functional recovery defined as Glasgow Outcome Scale Extended Score of <8; 2. Post-concussive symptoms defined as endorsing at least two symptom categories on the Rivermead Post-Concussion Questionnaire; 3. Depressive symptoms defined a score of ≥5 on the Patient Health Questionnaire-9.

New TBI in the Aged

HeadSMART

Figure 1. Bar Chart of Age Effects on Functional Recovery, Depressive Symptoms, and Post-Concussive Symptoms



Aging with a TBI

Overview Statistics

- Across all age groups, 5.3 million Americans are living with a TBI-related disability
  - Many of these individuals will live to be older adults

Aging with a TBI

Dementia Risk

- Even mild TBI without loss of consciousness has been associated with a 2-fold increase in risk of dementia diagnosis
- TBI may be a risk factor for early-onset (<65 years) Alzheimer's disease
  - Disinhibition a more likely symptom
- TBI associated with Parkinsonian signs and may be a risk for Parkinson's Disease

Aging with a TBI

Chronic Traumatic Encephalopathy

- A separate neurodegenerative process directly related to repetitive TBI
- Inconsistencies in the literature
- Age at first exposure seems important

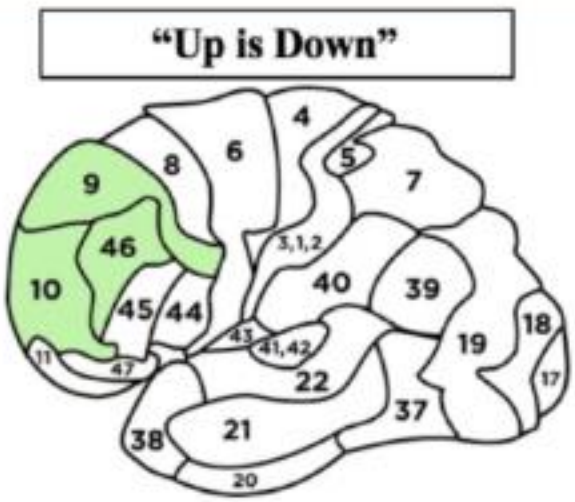
New or Existing TBI in the Aged

Mild Behavioral Impairment

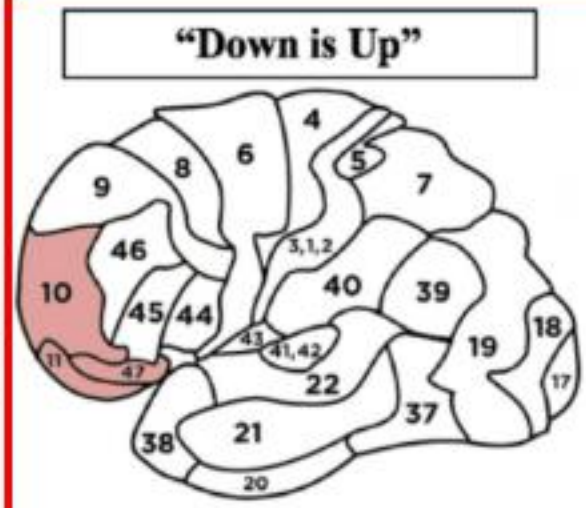
- **The emergence after the age of 50 years of sustained and impactful neuropsychiatric symptoms**
  - A precursor to cognitive decline and dementia
  - NPS can be of any severity, persist for at least six months, and occur in advance of or in concert with mild cognitive impairment (MCI)

Mild Behavioral Impairment

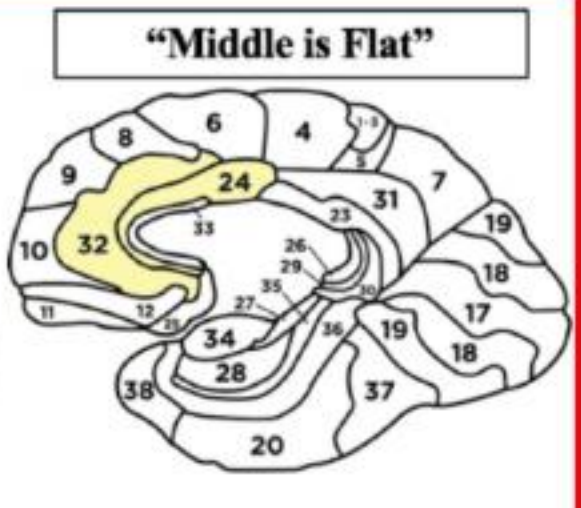
Hypotheses



Dorsolateral Prefrontal Loop
Dysexecutive Syndrome



Orbitomedial Frontal Loop
Disinhibition Syndrome



Anterior Cingulate Loop
Apathy Syndrome

Figure 1.
The Neuroanatomic Correlates of Syndromal Presentations after Traumatic Brain Injury

Mild Behavioral Impairment

National Alzheimer's Coordinating Center

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Cox Proportional-Hazards Models (All MBI Domains):

MBI Domain		Hazard Ratio	95% CI	*p*-Value
Abnormal Perception or Thought Content	Unadjusted	0.997	(0.530 - 1.874)	0.992
	Adjusted	1.050	(0.557 - 1.979)	0.8796
Affective Dysregulation	Unadjusted	1.002	(0.755 - 1.330)	0.988
	Adjusted	1.029	(0.775 - 1.367)	0.840998
Decreased Motivation	**Unadjusted**	**1.734**	**(1.240 - 2.425)**	**0.00129**
	Adjusted	**1.708**	**(1.220 - 2.392)**	**0.00182**
Impulse Dyscontrol	**Unadjusted**	**1.372**	**(1.040 - 1.811)**	**0.0252**
	Adjusted	**1.345**	**(1.019 - 1.776)**	**0.0364**
Social Inappropriateness	Unadjusted	0.946	(0.550 - 1.627)	0.841
	Adjusted	1.002	(0.581 - 1.727)	0.996
All MBI Domains (Any NPS)	Unadjusted	1.216	(0.968 - 1.528)	0.0933
	Adjusted	1.218	(0.969 - 1.531)	0.0917
All MBI Domains (Threshold of 2)	Unadjusted	1.192	(0.897 - 1.584)	0.225
	Adjusted	1.202	(0.904 - 1.598)	0.205

Mild Behavioral Impairment

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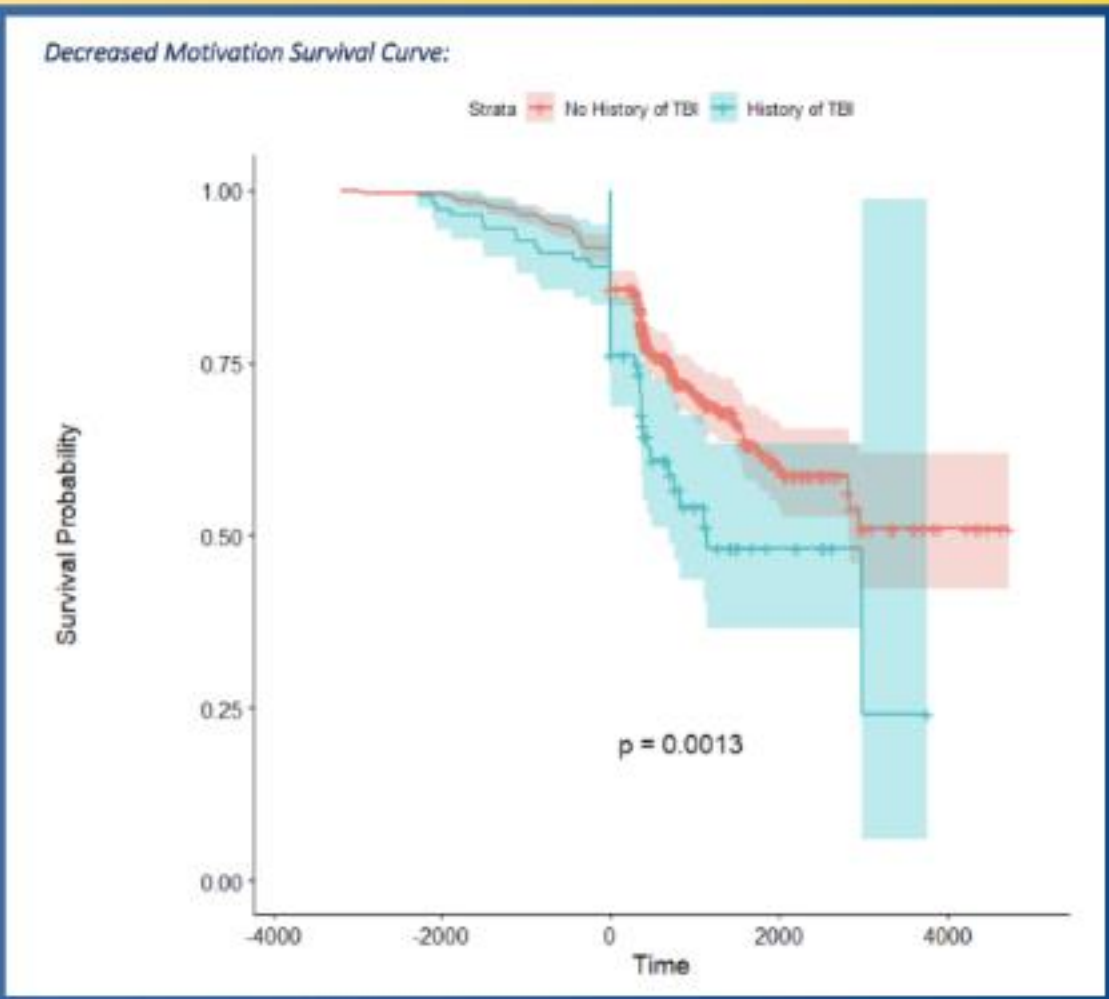

Mild Behavioral Impairment

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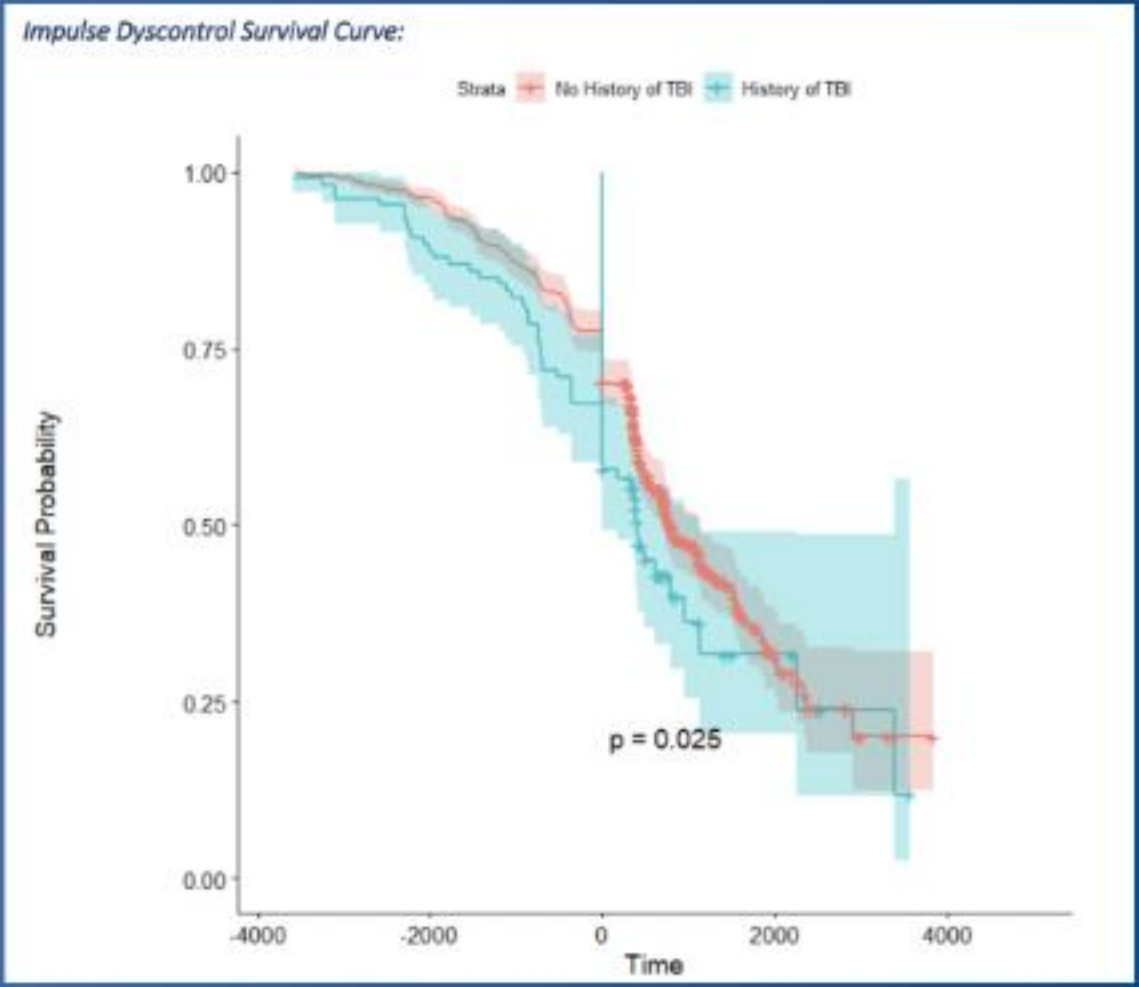

Mild Behavioral Impairment

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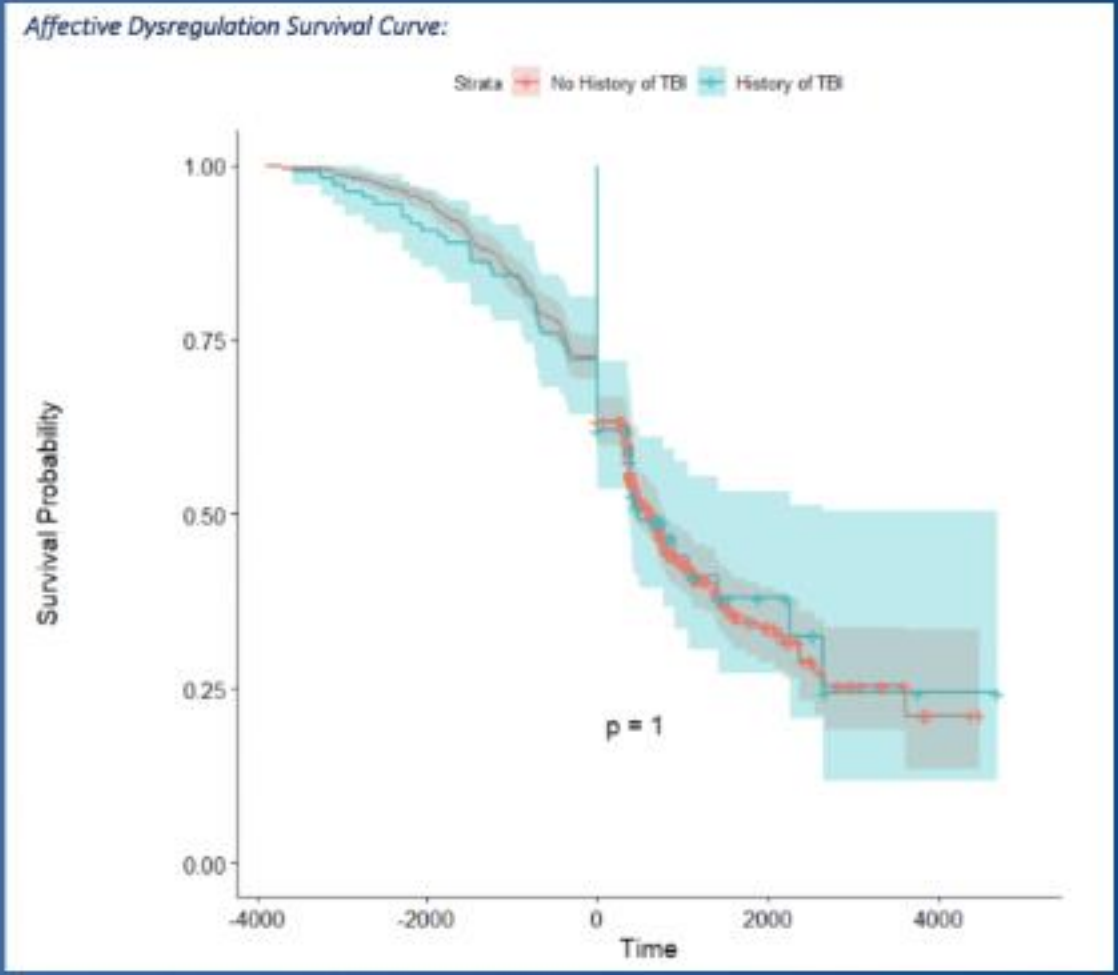
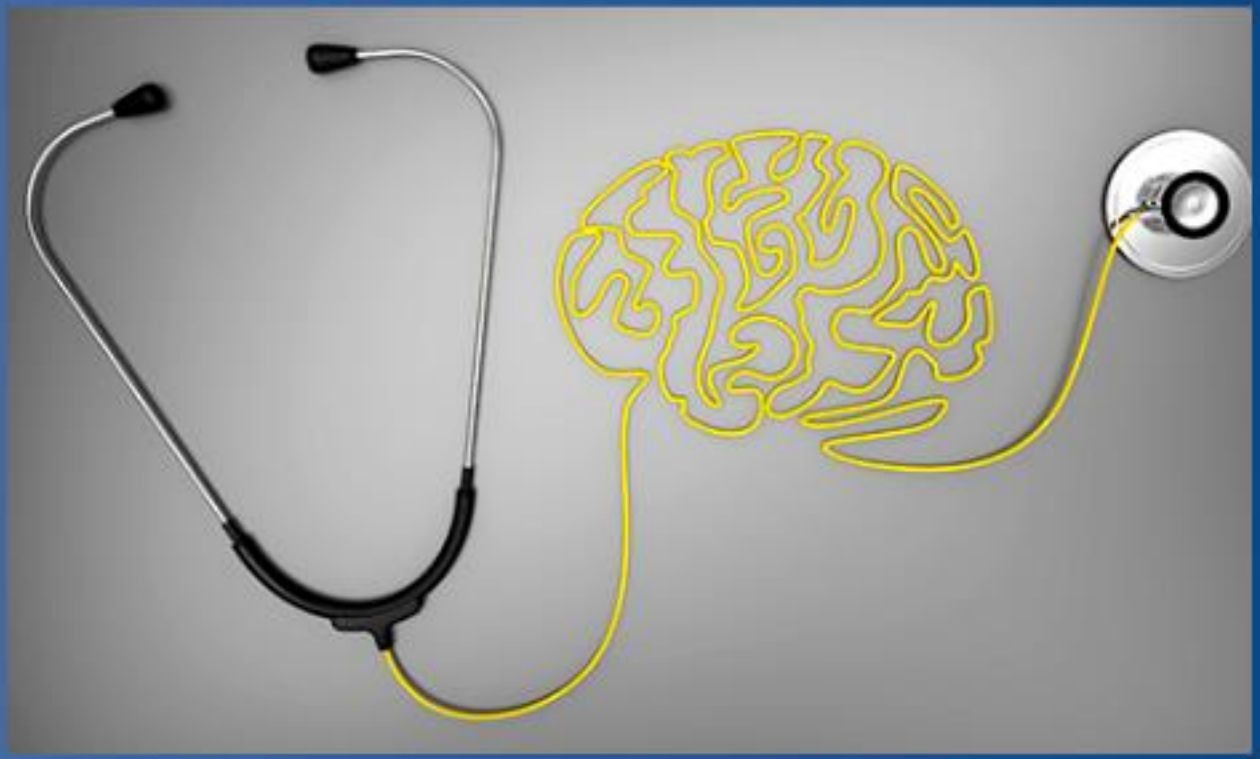


A Focused Clinical Approach



A Focused Clinical Approach

Era of Individualized Medicine

- Utilize patient characteristics and clinically relevant biomarkers to guide care
- There have been a few recent advances in the field of TBI

A Focused Clinical Approach

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Recent Advances

- Trauma-field triage criteria to optimally identify older adults with TBI who require emergent transfer to a trauma center
- Neurorehabilitation practices specific to older adults with a focus on removing "excess disability"

A Focused Clinical Approach

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Recent Advances

- Neurocritical care teams involving geriatricians
- Developing accreditation standards for geriatric trauma care
- Multidisciplinary, comprehensive fall clinics

A Focused Clinical Approach

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Future Directions

- Measures used to diagnose TBI and evaluate outcomes were developed in younger cohorts (e.g., GCS)
- Prognostic models (e.g., CRASH CT, IMPACT) show poor performance in older adults

Geriatric Approach to TBI Research

Current Issues

- Excluded from studies
  - upper age limit
  - Pre-existing conditions
  - Frail and unable to complete outcome assessments
  - Unable to travel for research appointments

Geriatric Approach to TBI Research

Possible Solutions

- A battery of neuroimaging- and blood-based biomarkers used to supplement clinician evaluations and inform on diagnosis in ambiguous cases
  - Optimal diagnostic biomarkers in TBI are not clear
- Systematically measure and study, rather than exclude for, pre-existing conditions and disability
- Reliance on proxy informants and study partners
- Home and telemedicine visits

Conclusions

- Working with older adults with TBI is extremely rewarding and a critical area of study that will become more important as the population ages

Conclusions

- It is important to distinguish an individual aging with a TBI versus an individual with new onset TBI later in life

Conclusions

- Clinical endeavors, such as comprehensive, multidisciplinary fall and TBI clinics, focused guidelines, etc. are an increasing focus

Conclusions

- With individualized, precision medicine a ”one -size-fits-all” approach is antiquated and unacceptable

Conclusions

- Geriatric research, particularly on Alzheimer's disease and related dementias, has an extensive track record and application of similar techniques to research on older adults with TBI will help move the field forward

Conclusions

- Older adults with TBI deserve the same advocacy and focused study as sports- and military-related TBI

Questions?

Please type your questions into the “Q&A” chat box at the bottom of your screen.

Next Webinar

In recognition of National Public Health Week and World Health Day, please join us for our next webinar:

Social Determinants of Mental Health for Older Adults: A New Perspective

April 7, 2020 @ 12:00pm EDT

Registration Coming Soon

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