TBI Research at Kessler Foundation

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Overview of TBI Research

• TBI Model System

• Areas of Specific Research
  – Functional Status
  – Rehabilitation
  – Imaging
  – Caregiver Health
  – Cross Cultural Influences
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TBIMS: Purpose

• Study the clinical course of individuals with TBI from time of injury through rehabilitation care

• Evaluate the recovery and long-term outcome of individuals with TBI

• Contribute data to a National TBI Database
  – Currently over 20,000 cases

• 16 centers nationwide
5 Components of any TBIMS

I. Exceptional Clinical Care throughout the continuum
II. National Data Collection
III. Site Specific Research Project
IV. Modular Participation
   – Collaborative Effort: at least 4 centers
V. Dissemination
   – Consumer
   – Professional
I. Clinical Care

• Kessler Institute for Rehabilitation

• 4 Acute Care Facilities
  – Morristown Medical Center
  – University Hospital
  – Hackensack University Medical Center
  – St. Joe’s Regional Medical Center
II. National Data Collection

• Data collected at several time points:
  – time of injury (during inpatient rehabilitation)
  – 1 year post injury
  – 2 years post injury
  – 5 years post injury
  – every 5 years thereafter
III. Site Specific Project

- Each center works independently
- Recruitment done at the center, so enrollment is only open to patients we see
- Cognitive Rehabilitation
IV. Modular Participation

- Every center must participate in at least one module
  - 10 ongoing modules around the country
  - Select modules based on interests and resources

- Topics
  - Menopause following TBI
  - Cognitive trajectories following TBI
  - Caregiver resilience
  - Health Literacy
  - Problem Solving Training for caregivers
V. Dissemination

• Professional
  – National and International Conferences
  – Local Presentations
  – Peer-reviewed publications
  – Pod-casts
  – Webinars

• Consumer
  – Newsletter
  – Conferences
Welcome to the new format of our TBI News & Views e-blast!
Please take the time to click through the links and read the exciting articles in this issue. Be sure to make note of our 
[upcoming consumer conference](#) on September 27th... we are in a new location this year! We are looking forward to seeing everyone!

Warm regards,

Nancy D. Chiaravalloti, Ph.D.
Director of Traumatic Brain Injury Research
Kessler Foundation
Personal Perspective: Richard Anderson – Called to Be an Advocate

In August 2004, I sustained a traumatic brain injury which left me with an invisible disability that I couldn’t see. Despite the Injuries Alliance and Head Injury Association, I was unable to find someone who could help me with the costs associated with my injury and the need for occupational therapy. In most cases, brain injury is a lifelong condition.

Press Releases

Kessler Foundation awarded 6 grants by New Jersey Commission on Brain Injury Research

Researchers received six grants totaling nearly $2 million to investigate novel ways to improve quality of life for individuals with traumatic brain injury and their caregivers.

EAST HANOVER, N.J. June 4, 2019 - Kessler Foundation researchers received six grants from the New Jersey Commission on Brain Injury Research, totaling nearly $2 million, more than half of the Commission’s 2019 funding of $3.7 million. Dr. Denis Kohn, PhD, Anthony Leasure, PhD, and Rajesh Pillai, PhD, received individual research grants. Vahram Shemey, MD, PhD, Elizabeth Weir, PhD, and Glenn Wykle, PhD, were awarded pilot study grants. Their studies are based on a variety of novel approaches aimed at improving the quality of life for individuals with traumatic brain injury (TBI) and their caregivers.

Individual research grants address caregiver grief, sleep and learning, and balance dysfunction.

Kessler Foundation award 3 grants by the National Institute on Disability, Independent Living, and Rehabilitation Research

Researchers received three grants totaling $972,000, one of which was given to the Center for Traumatic Brain Injury Research, to examine the prevalence and treatment of post-traumatic stress disorder (PTSD) in individuals with traumatic brain injury. The other two grants were given to the Center for Traumatic Brain Injury Research, to examine the prevalence and treatment of post-traumatic stress disorder (PTSD) in individuals with traumatic brain injury. The third grant was given to the Center for Traumatic Brain Injury Research, to examine the prevalence and treatment of post-traumatic stress disorder (PTSD) in individuals with traumatic brain injury.
Overview of TBI Research

• TBI Model System

• Areas of Specific Research
  – Functional Status
  – Rehabilitation
  – Imaging
  – Caregiver Health
  – Cross Cultural Influences
I. Functional Status

- Daily life
- Cognitive deficits
- Employment
- Aging
II. Rehabilitation

- Ties into Functional status
- Treating Emotional Processing Deficits
- Treating Sleep Disturbance
- Cognitive Rehabilitation
III. Imaging

- 3 Tesla GE Scanner
- Fatigue
- Cognition
- Emotional Functioning
- Biomarkers
- Treatment Efficacy
  - Cognition
  - Emotional function
  - Fatigue
IV. Caregiver Health

Ongoing studies

• Resilience
  – Chronic TBI
• Problem Solving Training
  – Inpatient, preparing for transition home
• Novel ways of working through the transition to caregiver
  – Tele-rehabilitation
IV. Caregiver Health
Recent Findings

• Helpful resources differ by caregiver relationship
  – Child caregiver
  – Parent caregiver
  – Spouse caregiver
Study Examples:

Impacting Outcome at all Stages
In the Trauma Center…
Trauma Center

• Purpose:
  – Not all acute care hospitals have a physiatrist on their trauma team. One of our acute care hospital does. Does this impact outcomes?

• Why is this important?
  – If we can identify the contributions of a physiatrist in the trauma center as beneficial to overall outcomes, other hospitals may consider adding this to their team and maximize outcome.

*Medication management differs with a physiatrist in the acute care setting (Neurostimulants and sleep meds)
During Inpatient Rehabilitation...
Acute Rehabilitation: Immediate and Delayed Outcomes and Brain Activation

- Striatum:
  - Immediate outcomes

- Lentiform nucleus
  - Delayed outcomes

Dobryakova & Tricomi, 2013
Acute Rehabilitation

• Context of outcome presentation influences brain mechanisms

Immediate outcomes: Striatum

Delayed outcomes: Lentiform nucleus
Acute Rehabilitation

- Circumvent inability to learn from immediate outcomes by altering outcome timing
  - Presenting outcomes after a delay

- Activating a different network
  - Switch from the striatum to lentiform nucleus by changing the way we provide feedback
Living Following TBI...
Chronic Stages:
1. Impacting Employment

• Purpose
  – Identify modifiable differences between individuals with TBI that are employed or unemployed

• Why is this important?
  – If we can improve a characteristic of individuals with TBI that are unemployed we may be able to improve unemployment rates in persons with TBI

Chronic Stages
Employed vs Unemployed

Chronic Stages

• Why is this important?
  – Identified a potentially modifiable factor

• Next step:
  – Identify and effective means of treating neurobehavioral symptoms

• End game:
  – Improve employment rates following TBI

Chronic Stages (Impacting Daily Life): 2. Prospective Memory

- Remember to remember

- Why is this important?
  - PM has a substantial impact on daily life functioning
  - We need to understand it

Monitoring model: “baking cookies”

**TEST**

*are the cookies baked?*

**WAIT**

*close oven – resume activities*

**EXIT**

*take cookies out of oven*

*YES*
Time Monitoring in TBI

- Flattened monitoring curve
- Independent of time estimation and production
- Related to cognitive abilities

Carlesimo et al., 2004
Chronic Stages

• Why is this important?
  – PM has a substantial impact on daily life functioning
  – Identified a potentially modifiable factor

• Next step:
  – Identify and effective means of treating TB prospective memory

• End game:
  – Improve daily life functioning following TBI

Chronic Stages

• Why is this important?
  – PM has a substantial impact on daily life functioning
  – Identified a potentially modifiable factor

• Next step:
  – Identify and effective means of treating TB

• End game:
  – Improve daily life functioning following TBI

Funding Sources

KESSLER FOUNDATION

NATIONAL INSTITUTES OF HEALTH

NATIONAL INSTITUTE ON DISABILITY, INDEPENDENT LIVING, AND REHABILITATION RESEARCH

NEW JERSEY COMMISSION ON BRAIN INJURY RESEARCH
Collaborators

- John DeLuca, PhD
- Ekaterina Dobryakova, PhD
- Denise Krch, PhD
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- Jean Lengenfelder, PhD
- Anthony Lequerica, PhD
- Nancy Moore, MA
- Angela Smith
- Erica Weber, PhD
- Glenn Wylie, D.Phil.
THANK YOU

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