Traumatic Brain Injury as a Chronic Health Condition
John D. Corrigan, PhD

Most traumatic brain injuries (TBI) are mild and cause temporary neurological impairment. While some mild TBIs, and many more severe injuries, cause permanent changes, the clinical precept of the past was that residual impairments due to TBI are static once an initial recovery phase has plateaued. This assumption—that the effects of TBI do not change over the remainder of a person's life—has been drawn into question by several independent bodies of research. The emerging picture is that for more severe injuries, as well as some less severe, the long-term course of TBI is better characterized as a dynamic rather than static and necessitates being approached as a chronic health condition. Data supporting this new conception of TBI will be presented and implications for proactive management strategies will be discussed.

At the conclusion of Dr. Corrigan's presentation, participants will be able to describe change in function from rehabilitation discharge to five years’ post-injury, explain conditions with the greatest excess mortality for persons receiving rehabilitation for TBI, and discuss issues to be addressed in developing a proactive approach to long-term management of moderate and severe TBI.

WORKSHOPS

The overall objective of this seminar is to provide an educational opportunity to professionals working with individuals affected by brain injury through workshops related to research, clinical innovations and strategies, rehabilitation, and advocacy.

7:30 AM - 8:30 AM    Registration, Exhibits, and Continental Breakfast
8:30 AM - 9:15 AM    Opening Remarks
9:15 AM - 10:30 AM   Keynote Presentation

10:30 AM - 10:45 AM  Break and Exhibits
10:45 AM - 12:00 PM  Morning Workshops

1. Clinical Applications of Neuroimaging
Ekaterina Dobryakova, PhD; Nancy Chiaravalloti, PhD; Olga Boukrina, PhD

In this workshop, the audience will hear about clinical applications of neuroimaging research studies. Particularly, presenters will give a brief overview of neuroimaging and talk about current applications of neuroimaging to rehabilitation. The talk will include information about an experimental paradigm that explores how the timing of feedback influences different brain networks and how brain networks change in individuals with TBI from before to after the modified Story Memory Technique, 10 session memory rehabilitation protocol. The workshop will conclude with potential future directions. Specifically, the presentation will include information about how neuroimaging can shed light about trajectories of recovery during learning and other domains of cognition. At the conclusion of this activity, participants should be able to explain how the timing of feedback can improve learning outcomes, explain the effect of memory rehabilitation on brain activity, and recognize the promise of neuroimaging in the clinical realm.

2. Creative Treatment Strategies for Rehabilitation Throughout the Aging Process in Chronic Brain Injury
Ilana Beitscher, MS, OTR and Jenna Tucker, PT, DPT, NCS, CBIS

Brain injury, whether traumatic or non-traumatic, is often the beginning of lifelong rehabilitation. Individuals with long-term brain injuries may encounter recovery plateaus, particularly during transitions following acute and sub-acute phases of rehabilitation. In addition, the onset of the aging process may occur earlier in the lifespan in this population, and present as a compounding factor for ABI-based impairments. Incorporating creative treatment strategies can be highly effective in the treatment of adults with chronic brain injury symptoms to address individualized needs, promote ongoing improvement when possible, and delay the effects of aging. (Continued on page 4)
Non-traditional therapeutic approaches provide opportunities for the interdisciplinary team to enhance treatment plans with unique activities to improve client initiation, motivation, and participation across the lifespan. Examples of these approaches may include the use of canine-assisted therapy, group therapeutic fitness/wellness classes, community reintegration activities, creative use of music during therapy sessions and functional group activities. Following this presentation, participants will be able to discuss information from current literature regarding aging in clients with a history of brain injury, explain common challenges in PT/OT treatment of long term brain injury, and describe how to implement creative strategies to enhance treatment interventions for this population.

3. Nonpharmacological Management of Sleep Disturbances after Traumatic Brain Injury

Alphonsa Thomas, DO

Sleep plays an integral role in the recovery of patients with brain injury. When it is disrupted it can lead to impairments in physical function, cognition, mood and lead to overall stagnation of neuro-recovery. The prevalence of sleep disorders can range from 30-84% in the traumatic brain injury (TBI) population. TBI patients with sleep disorders have been found to have longer inpatient hospital stays, higher cost of rehabilitation and higher rates of functional disability. There are several ways by which sleep disorders are managed which range from conservative to pharmacological treatments. The method of intervention also depends on the underlying impairment. This presentation focuses on the non-pharmacological treatment of sleep disorders in TBI. Following this presentation, participants will be able to explain the effect that lack of sleep has on brain injury recovery, describe 2 - 3 measures used to diagnose sleep disorders, and list three non-pharmacological options for sleep management in the TBI population.

12:00 - 1:15    Lunch, Poster Review and Exhibits

1:15 - 2:30    Afternoon Workshops

4. New Jersey Traumatic Brain Injury Model Systems Centers Progress Update

Nancy Chiaravalloti, PhD and Yelena Goldin, PhD

NIDILRR funds 16 TBIMS Centers throughout the US. Two centers in New Jersey serve as TBIMS centers: JFK-Johnson Rehabilitation Institute and Kessler Institute for Rehabilitation/The Northern New Jersey Traumatic Brain Injury Model System. JFK-Johnson’s site-specific research project focuses on examining the ability to complete activities necessary for daily functioning throughout the first year of injury and before and after outpatient brain injury cognitive rehabilitation with the goal of better understanding the needs of patients during different stages of their recovery and across different settings. Kessler’s site-specific research project focuses on evaluating a novel treatment intervention to address impairments in new learning and memory with the goal of improving everyday functioning. In this workshop, the project director of each center will present the current state of progress of these research projects, including preliminary findings and their implications. Following this presentation, participants will be able to explain activity limitations in individuals with traumatic brain injury, discuss impairments and treatment of new learning and memory in individuals with traumatic brain injury, and review current research carried out by New Jersey TBI Model Systems Centers.
5. Pediatric Concussion Rehabilitation - Using Evidence Based Treatment to Promote Recovery
Danit Macklin, PT, DPT
For many years’ concussions were thought to be best treated with only rest. This led to the well-known use of “cocoon therapy” which meant patients were instructed to be in a dark room with little to no stimulation until they felt better. However, in the past several years, more and more studies have proven that not only is that ineffective, but actually may prolong and complicate recovery. Experts in treatment of concussion now promote “active rehabilitation” and have learned that it is critical to return to ADLs after the first 24-48 hours as tolerated. There are many domains that are affected by concussion (mood, sleep, cervical pain, dizziness and balance, headaches, exertion intolerance) making this an injury best served by an interdisciplinary team. Physical Therapists are a major part of the treatment team since PT addresses multiple domains affected such as cervical pain, dizziness, balance, and exertion intolerance. Following this presentation, participants will be able to describe the multiple domains potentially affected by concussion and the disciplines involved in treatment, identify two tests for vestibular or oculomotor involvement and exertion intolerance in patients who have sustained concussions, and describe an approach of active rehabilitation to assist patients in returning to school life and eventually returning to sport.

6. How Individuals with Brain Injury May Benefit from Advocacy Support and Guidelines for Self Advocacy
Gwen Orlowski, JD; Mary A. Ciccone, JD; Michael R. Brower, JD; and Susan Head, MSW
Successful community integration for individuals with brain injury can depend on overcoming barriers to service provision and accessing the rehabilitative supports and services recommended by treating professionals. DRNJ staff will present short overviews of specific community service systems, identifying barriers to services, while maintaining a focus on advocacy strategy development. We will guide participants through a Medicaid TBI-specific HCBS appeals process, and provide tips on building a strong advocacy case. Participants will learn how to navigate the state vocational rehabilitation service system to prepare for employment, and how to access reasonable work accommodations. In the second part of the session, we will ask participants to work in small groups to analyze a case study that combines components of the topics presented. At the conclusion of this activity, participants should be able to: identify community based brain injury supports and services, and access these services, build a strong case to appeal a denial, or reduction of rehabilitative services, and understand how to access services for individuals with brain injury from state agencies that can assist with employment.

2:30 - 2:45  Afternoon Snack Break and Exhibits
2:45 - 4:00  Afternoon Workshops

7. Medical Marijuana & TBI: Where Have We Been, Where Are We Now, and Where Are We Going?
Scott Peters, MS, OTR/L
Medical marijuana was first legalized in the United States in 1996. Since then 46 states have some form of medical or recreational use protections for cannabis. Each participating state has introduced guidelines about who is eligible to use this agent and for what approved medical conditions. Despite the greater availability of medical marijuana in the United States the federal government still considers marijuana a Schedule I controlled substance thereby limiting the research necessary to determine how best to use this agent. As a result, providers of TBI services and TBI survivors are at a loss about what works and what doesn’t work when considering use of medical marijuana to treat symptoms associated with TBI recovery. This presentation is intended to provide a current review of the literature that discussed the effectiveness of medical marijuana when treating conditions such as pain, spasticity, and anxiety and the potential negative impact of its use on mood and cognition. Additionally, this presentation is intended to provide practical information about how to incorporate medical marijuana into institutional, residential and outpatient settings. (Continued on page 6.)
Following this presentation participants will be able to describe the role of cannabinoids and cannabinoid receptors, cannabis products and routes of administration, explain the therapeutic effects of cannabis and cannabinoids on three topics related to TBI recovery, i.e. chronic pain, epilepsy, spasticity, anxiety, depression and sleep according to recent research, and discuss potential incorporation of medical marijuana into TBI treatment planning according to current NJ state law guidelines.

8. Comprehensive Approach to Concussion and Athlete Brain Health
Matthew McCarthy, MD
Brain health is an important consideration in providing care for athletes of all ages and in all sports. This course will review recent evidence-based guidelines and current best practices for the management of neurological disorders in athletes. This includes concussion, post-concussion syndrome, potential long-term consequences of repetitive head impacts, and treating athletes with pre-existing neurological diagnoses. There will be an emphasis on the active management of neurological injuries and the importance of a comprehensive and individualized approach to each patient. The course will examine these issues through the lens of a sports career, covering topics including baseline neurological testing, concussion diagnosis and management, post-concussion syndrome diagnosis and management, long-term concerns (such as CTE), strategies to promote safe participation in sports, and retirement decisions. At the conclusion of this activity, participants should be able to: evaluate the role of baseline neurological testing and determine the ideal approach to collecting baseline information, educate others on concussion and post-concussion syndrome and distinguish between these two entities. Participants will also know the current best practice for management of concussion and post-concussion syndrome, highlighting an active and individualized approach to treatment and rehabilitation.

9. Research Panel:

The Association Between Venous Thromboembolism, Vitamin D Level and Vitamin D Supplementation in Patients with Traumatic Brain Injury
Matthew Moore, DO
Traumatic Brain Injury can lead to hemiparesis and immobility, contributing to venous stasis in the acutely injured patient. There are often risks to starting chemical DVT prophylaxis secondary to hemorrhage in the brain. A 2009 retrospective study showed a threefold to fourfold increased risk of DVT formation among patients admitted with TBI to a US Level I Trauma Center. In 2019, a study with spinal cord injury patients was completed looking at associations between vitamin D levels, supplementation, and presence of VTE. In that study, there was no statistically significant association between low vitamin D and VTE. However, there was a statistically significant difference in presence of VTE between those receiving vitamin D replacement and those not receiving replacement. This retrospective study looked similarly at the association of low vitamin D levels, Vitamin D supplementation, and the presence of VTE. At the conclusion of this activity, participants should be able to distinguish the increased risks TBI patients have of acquiring venous thromboembolism, understand the association between vitamin D levels and thromboembolism, and understand the association between TBI patients and low vitamin D levels.

Transportation in TBI: An Exploration Into the Usage, Advantages, and Barriers of E-hail in the TBI Population
Laurie Dabaghian, MD
The goal of this exploratory qualitative study is to examine the mode of transportation used by patients in the TBI population to get to medical appointments. Furthermore, to explore the use and knowledge of rideshare/e-hail in the TBI population and to further understand the advantages of and barriers to the use. Transportation is a limiting barrier in this patient population, preventing access to healthcare and impacting life satisfaction and social integration. (Continued on page 7.)
With the emergence of E-hail/Rideshare technologies (Lyft and Uber), the TBI population may have a new mode of transportation that can be used to access healthcare and provide independence in transportation. This project is to be conducted over the phone as a structured interview and participants are recruited from the Model Systems database. The data is analyzed to describe the mode of transportation commonly used to get to medical appointments and to further explore the use, knowledge, advantages and barriers to e-hail use. At the conclusion of this presentation participants will be able to identify preliminary data on the mode of transportation patients with TBI use to get to medical appointments, identify descriptive statistics of e-hail users in the TBI population, and demonstrate the usage, advantages and barriers of e-hail among the TBI population.

Delirium as a Risk Factor for Acute Care Transfers in an Acute Care Rehabilitation Center, with a Focus on the Brain Injury Population
Sharon Bushi, MD
A total of 1,567 patients (53.86% female, mean age 72.86 +/- 13.9) were included in the analysis. Within this group, 472 patients (46.19% female, mean age 70.75 +/- 14.6) are those admitted under diagnoses of brain injury (acquired and traumatic). Of these patients, 71 (15.0%) were found to have a positive score on 3D-CAM indicating delirium on admission. Of the 71 that were positive, 17 (23.9%) had ACTs, whereas only 47 (13.6%) of those with negative 3D-CAMs had ACTs. A chi-square analysis shows statistical significance in association between those transferred with those having delirium (p=0.02). More importantly, a multiple logistic regression within the non-traumatic brain injury population, showed an increased risk for ACT for patients who are considered to have delirium with an odds ratio of 5.15 (0.78-33.9, p=0.09) after adjusting for age, gender and motor function on admission. Following this presentation, participants will be able to identify the various forms of delirium that can present in the inpatient rehabilitation setting, calculate the consequences of delirium on admission to patient-related outcomes in the inpatient rehabilitation setting, and screen the brain injury population within the inpatient rehabilitation setting and educate on delirium and its effects within this specialized population.

Does Intrathecal Baclofen Therapy Lead to an Improvement in Impairments and/or Functional Limitations Experienced by Patients with Acquired Brain Injury? A Retrospective Study
James M. Anderson, PT, MPT
Intrathecal Baclofen Therapy is currently widely used for the treatment of spasticity in multiple patient populations, including acquired brain injury. The purpose of this study is to review functional outcome data in this specific patient population and utilize this evidence to assist in determining the optimal treatment plan for these patients. Additionally, the evidence gained can help provide education to patients who present with spasticity related to their acquired brain injury. This, in turn, will assist them and their families in making an informed decision about Intrathecal Baclofen Therapy. A retrospective study is currently being conducted via medical record reviews, to determine if the administration of Intrathecal baclofen therapy in patients with acquired brain injury correlates to an improvement in specific functional outcome measures. A standardized data collection form was used along with a procedural manual for data abstraction. Results are pending as the study is currently in progress. At the conclusion of this presentation, participants will be able to identify possible benefits of Baclofen pump placement, interpret possible side effects/risks of Baclofen pump placement, and scrutinize appropriate candidates for pump placement based on clinical presentation.