TIRR Rehabilitation Research and Training Center on Rehabilitation Interventions Following TBI

CENTER DIRECTOR

Walter M. High, JR., PhD, is a neuropsychologist and has been Principal Investigator for the TBI Model System Research Program since 1994. He has been the Director of Research for the RRTC on Rehabilitation Interventions Following TBI since 1993 and became Principal Investigator and Project Director in 1996 following the retirement of Dr. Don Lehmkuhl. He is the Director of the Brain Injury Research Center of TIRR. Dr. High is Assistant Professor in the Department of Physical Medicine and Rehabilitation, Baylor College of Medicine and is Clinical Assistant Professor in the Department of Physical Medicine and Rehabilitation, UT-HMS and in the Department of Psychology at the University of Houston. He has published and presented many papers on brain injury rehabilitation, and has been an invited speaker at many national brain injury conferences. Dr. High directs the day-to-day operations of the RRTC.

DIRECTOR OF RESEARCH

Angelle M. Sander, PhD, is Assistant Professor in the Department of Physical Medicine and Rehabilitation at Baylor College of Medicine and is Associate Director of TIRR'S Brain Injury Research Center. She is a licensed neuropsychologist who specializes in the area of TBI but also has experience with a variety of neuropsychological disorders, including epilepsy and stroke. Dr. Sander's research interests include the assessment and prediction of outcome after TBI and the impact of TBI on the family. She is currently Principal Investigator for a multicenter grant investigating the impact of the family environment on patient and family outcome after TBI. Dr. Sander is also the Principle Investigator on a Model System project investigating the impact of extended case management on vocational outcome. She is Adjunct Assistant Professor at the University of Houston, where she co-teaches a course on neuropsychological rehabilitation. Dr. Sander oversees the daily research activities of the RRTC.

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Our Mission

The RRTC on Traumatic Brain Injury at The Institute for Rehabilitation and Research (TIRR) promotes the scientific advancement of rehabilitation research by focusing on several of the areas identified by NIDRR, as well as by the NIH Consensus Conference, as needing further research. First, two of our research projects focus on improving the diagnosis and treatment of persons with mild TBI. These goals conduct a comprehensive study of the physical, cognitive, affective, and environmental factors affecting outcome, and by piloting and conducting a randomized clinical treatment trial for persons with mild TBI. Second, we address the special needs of children with TBI by conducting a randomized treatment trial comparing errorless learning and trial-and-error learning. Third, we develop and evaluate a community-based outreach program to intervene with family members. Finally, our training activities provide: an informational and technical assistance resource for consumers and professionals; training for medical and neuropsychological fellows in rehabilitation research; a state-of-the-science conference on mild TBI; and an educational videotape to train ethnically diverse family members in effective coping skills. Through representation on our advisory committees, consumers are involved in all aspects of planning and evaluating research and training activities.

DIRECTOR OF TRAINING

Karen A. Hart, PhD, is a tenured Associate Professor in the Department of Physical Medicine and Rehabilitation and Vice President for Education at TIRR. Dr. Hart is also Director of Education for the Departments of PM&R at Baylor College of Medicine and the University of Texas-Houston Medical School and in that capacity oversees the residency and fellowship training programs for the largest PM&R residency program in the United States. She has been Director of Training for three RRTC's during the past 15 years (RRTC for Community-Oriented Services for Persons with Spinal Cord Injury (SCI), RRTC on Community Integration of Individuals with SCI, and RRTC on Rehabilitation Interventions Following TBI. For the past four years she has served as Center Co-Director on the RRTC for Community Integration of Individuals with SCI. Dr. Hart is a past President of the National Association of Rehabilitation Research and Training Centers and is a past President of the American Congress of Rehabilitation Medicine. Dr. Hart oversees the day-to-day operation of the training projects.

INVESTIGATORS

◆ ***Charles Contant, PhD,*** is a Biomedical Statistician with extensive experience in the field of TBI. Dr. Contant is Assistant Professor in the Department of Neurosurgery, Baylor College of Medicine and has been the primary biostatistician on many medical and behavioral clinical trials involving persons with TBI. Dr. Contant's expertise is particularly valuable because of his knowledge of the content of TBI research as well as his statistical knowledge.

◆ ***H. Julia Hannay, PhD,*** is Professor of Psychology at the University of Houston where she is the director of neuropsychology track of the APA accredited clinical psychology doctoral program. Dr. Hannay is the past President of the International Neuropsychological Society and has played a prominent role in establishing standards of training for neuropsychologists. Dr. Hannay's research interests and expertise include visuospatial processing, cerebral blood flow, animal behavior, acute physiological predicators of outcome following TBI and rehabilitation. Dr. Hannay is the primary neuropsychologist for the NICU at Ben Taub General Hospital. She has participated in a randomized clinical trial comparing the efficacy of neurosurgical protocols for preventing anoxic/ischemic events. She has been a principal collaborator with the RRTC on Rehabilitation Interventions Following TBI for the past 5 years. Dr. Hannay will oversee all of the assessment portions of Projects R1 and R2.

◆ ***Harvey Levin, PhD,*** is Research Director of TIRR as well as for the Departments of Physical Medicine and Rehabilitation of Baylor College of Medicine and the University of Texas Health Science Center. Dr. Levin is a past President of the International Neuropsychological Society. His work has elucidated the relationship of the pathophysiology of brain injury, including the utilization of magnetic resonance imaging to characterize focal brain lesions and tissue loss, to the neurobehavioral sequelae in children and adults, and quality of life issues. His work in mild TBI has been seminal. Dr. Levin is the Principal Investigator on a NIDRR collaborative grant to study the effects of Ritalin on working memory. He is also the Principal Investigator of a CDC grant to study the incidence of depression following mild TBI. Dr. Levin's research has also produced widely used assessment instruments, including the Galveston Orientation and Amnesia Test to evaluate posttraumatic amnesia, and the Neurobehavioral Rating Scale which measures behavioral disturbance after brain injury.

◆ ***Claudia Robertson, MD,*** is Medical Director of the Neurosurgical Intensive Care Unit at Ben Taub General Hospital and Professor in the Neurosurgery Department of Baylor College of Medicine. Her research interests include acute care management of traumatic brain injury, cerebral blood flow physiology, and nutritional support of trauma patients. Dr. Robertson has an international reputation for research in these areas and is currently a principal investigator on an NIH-NINDS program project grant entitled "Vascular Mechanisms of Secondary Insults After Severe Traumatic Brain Injury." The studies funded by this grant will be investigation of the role of nitric oxide in the cerebral blood flow abnormalities that occur after brain injury.

◆ ***Margaret Struchen, PhD,*** is a neuropsychologist with extensive experience in research, assessment, and rehabilitation of persons with TBI. Dr. Struchen has spent the last 18 months as the chief neuropsychologist at the Challenge Program. Dr. Struchen will be responsible for the delivery of the rehabilitation interventions in project R2.

Mild TBI…

Determination of the Risk Factors Associated with Poor Outcome Following Mild Traumatic Brain Injury

Principal Investigator
Walter M. High, PhD

Co-Investigators
H. Julia Hannay PhD, Margaret Struchen PhD, Angelle Sander PhD, Charles Contant PhD, Harvey S. Levin PhD, Claudia Robertson MD, Alex Valadka MD, Gerard Francisco MD, Cindy Ivanhoe MD

Mild TBI resulting in loss or alteration of consciousness is a serious health problem in the United States. Conservative estimates are that approximately 400,000 persons per year sustain these injuries. Assuming a normal life span, it is estimated that 12.5 million persons (5% of the population) have sustained a mild TBI resulting in medical treatment. Symptoms following mild TBI include memory difficulties, difficulty concentrating, headaches, fatigue, dizziness, sensitivity to noise, irritability and anxiety. It is reported that most persons recover well following a single, uncomplicated mild TBI. However, some persons have substantial problems following mild TBI. Some persons have symptoms severe enough to interfere with return to work and other normal life activities. Persons with persisting problems are often seen in clinics, but figures concerning how often these symptoms occur, vary greatly across studies depending on the populations sampled. It is unclear why symptoms persist in some individuals and not others.

In the first two years of the RRTC, a risk factor study for poor outcome following mild TBI will be conducted. One week following injury, persons with mild TBI will be extensively examined. Comprehensive measures of cognitive and affective functioning will be administered to estimate both current and pre-injury functioning as well as measures of environmental support. These measures will be used to determine risk factors for persisting symptoms and poor outcomes at 3 months following injury.

Development and Evaluation of an Innovative Program to Improve Outcomes in Persons at Risk Following Mild or Complicated Mild TBI

Principal Investigator
Walter M. High, PhD

Co-Investigators
H. Julia Hannay PhD, Margaret Struchen PhD, Angelle Sander PhD, Charles Contant PhD, Harvey S. Levin PhD, Claudia Robertson MD, Alex Valadka MD, Gerard Francisco MD, Cindy Ivanhoe MD

The results of the risk factor study will be used to guide the development of a randomized clinical trial of cognitive-behavioral interventions designed to reduce the risk of poor outcomes following mild TBI. The trials will be designed for intervention very early in the recovery process to prevent the development of depression, anxiety, and stress that are thought to exacerbate cognitive and affective symptoms precipitated by mild TBI.

Pediatric TBI…

Evaluation of the Errorless Learning Technique in Children with Traumatic Brain Injury

Principal Investigator
Harvey S. Levin, PhD

Co-Investigators
Linda Ewing-Cobbs, PhD, Gerri Hanten, PhD, James X. Song, MS

This project examines the efficacy of errorless learning techniques in children with TBI. The cognitive and academic problems of children with TBI have not been extensively studied. Techniques for the remediation of memory difficulties and their impact on academic achievement have been studied even less. Errorless learning techniques have been studied in children with developmental disabilities and in adults with TBI with some success. This study will apply these techniques to children with mild to severe TBI.

Families and TBI…

Development and Evaluation of a Community-Based Family Outreach Program for Traumatic Brain Injury

Principal Investigator
Angelle M. Sander, PhD

Co-Investigators
Walter M. High, PhD, H. Julia Hannay, PhD

For many family members, the life-altering occurrence of injury to a loved one results in enduring emotional distress, disrupted family functioning, and social isolation. In previous research conducted at TIRR, we have found that individual family member characteristics, such as family members' coping style, perceptions of stress, and satisfaction with social support, were predictive of their overall emotional adjustment. The findings imply that family interventions should target the development of effective coping skills, reappraisal of stressful events, and fostering of social support. The aim of the RRTC family project is to implement such an intervention with a population of family members who are typically underserved. Participants will be family members of persons admitted to the local county hospital with severe, moderate, or complicated mild injury. One quarter of these persons are from minority backgrounds, and only about 25% receive any rehabilitation services. Family members will be visited in their home at 6 months after injury and will complete pre-test measures of family functioning, coping skills, emotional distress, and perceived social support. They will then be offered participation in a 1-day treatment seminar, free of cost. Those who choose not to participate will be given written educational materials. Both groups will complete post-test measures one month later.

Director of Training
Karen A. Hart, PhD

National Information, Educational Resources, Dissemination and Technical Assistance Center for the Rehabilitation of Persons with Traumatic Brain Injury

The center is designed to provide information about TBI to families, persons with TBI and a variety of professional and lay audiences. There are four components that are being developed through the RRTC. The first is a website with email. The website is in early development and is available through the internet at www.braininjuryresearch.org. The database of educational resources on TBI contains 340 resources and inquirers can find out about TBI resources throughout the country by calling the RRTC at 713-797-5947. The database is being prepared for accessibility through the website and will be available on line soon. The final two components of the project are the ongoing technical assistance and a newsletter for people with TBI and their families that are available through the mail and will be on the website as well. Inquiries for technical assistance can be made through email khart@bcm.tmc.edu or telephone 713-797-5946. This center will continue through the five years of the RRTC.

Rehabilitation Research Fellowships

Each year the RRTC funds the training of one pre-doctoral fellow and one post-doctoral fellow. The fellowships are designed to increase knowledge about rehabilitation neuropsychological research strategies, methodologies and manuscript writing specifically in TBI. The fellows conduct research about traumatic brain injury as a member of a research team and prepare for national presentation and publication. The post-doctoral fellowship offers a unique combination of training with rotations at University of Texas M.D. Anderson Cancer Center, University of Texas-Houston Medical School Neurosurgery, Baylor College of Medicine Neurology and Pediatric Neurology, and TIRR's Brain Injury Research Center. The fellowship is approved by the American Academy of Clinical Neuropsychology. Inquiries about the fellowships should be directed to the RRTC Director, Walter High, Ph.D. at whigh@bcm.tmc.edu.

State-of-the-Science Conference and Book on Mild Traumatic Brain Injury

During the RRTC's third year, a conference will be held with scientists devoted to work in mild TBI. The conference will serve as a foundation for the publication of a book dedicated to mild TBI. The conference and book will identify the current state of knowledge on specific areas of mild TBI research, identify areas of need for future research and apply strategies, techniques and methodologies for more effectively providing rehabilitation services to people with mild TBI and, perhaps, abandon ineffective strategies and techniques.

Coping with Traumatic Brain Injury: A Videotape Guide for Families

During the final project year, a videotape will be developed from results of the Community Based Family Outreach Program. The coping interventions that have been most effective for families will be discussed in both the Spanish and English versions. The intent is that families who view the videotape will increase their own strategies for coping with the issues surrounding TBI, will be aware of additional available resources and will develop more strategies for managing the behavior of their loved one with TBI.

In Memoriam

L. DON LEHMKUHL, PHD

January 2, 1930 - March 19, 2000

L. Don Lehmkuhl, PhD, was the Director and Founder of the Brain Injury Research Center at TIRR. He was the Director of both the RRTC on Rehabilitation Interventions Following TBI and the TBI Model System of TIRR during their formative years. Don was a devoted husband, father, grandfather, scientist, humanitarian, and friend. Don had several careers as a naval engineer, a physical therapist, a neurophysiologist, Associate Professor of Physical Therapy and Physiology at Case Western Reserve University, Assistant Director, Department of Allied Medical Professions and Service for the AMA, before founding the Brain Injury Research Center of TIRR and Baylor College of Medicine. In every field, Don left his mark. He received some of the highest awards bestowed by the American Physical Therapy Association, the American Occupational Therapy Association, International Society of Prosthetists and Orthotists, Texas Head Injury Foundation, National Head Injury Foundation, Baylor College of Medicine, the American Congress on Rehabilitation Medicine, and it's Brain Injury Interdisciplinary Special Interest Group. He authored or co-authored nearly 100 peer reviewed articles, books, book chapters, and scientific abstracts. Don was a leader in the field of brain injury rehabilitation and worked tirelessly to improve the lives of persons with TBI. We will all miss him.

Rehabilitation Research and Training Center on
Rehabilitation Interventions in Trumatic Brain Injury
TIRR (The Institute for Rehabilitation and Research)
Division of Education, B-107
1333 Moursund
Houston, TX 77030-3405

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