

## UPDATE REPORT

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# Brain Injury Rehabilitation Research

## National Invitational Meeting on Medical Rehabilitation Research

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The National Institute on Disability and Rehabilitation Research (NIDRR) held a two day workshop entitled National Invitational Meeting on Medical Rehabilitation Research in Tyson's Corner, Virginia, on October 10 and 11, 1990. All project directors of NIDRR-funded grants were invited to participate. The meeting, sponsored by the Rehabilitation Research and Training Center on Severe Traumatic Brain Injury at the Medical College of Virginia, was convened to meet several NIDRR agenda items, including:

1. To identify research priorities in rehabilitation to assist NIDRR in planning their long range agenda
2. To encourage and provide an opportunity for members of the research community to exchange information regarding research endeavors and address mutual concerns
3. To develop a list of topics for consensus conferences in order to disseminate information to professionals, laypersons, and third party payors regarding priority issues within the field of rehabilitation
4. To promote better management and planning within NIDRR-sponsored medical research projects by involving leaders of research in the long range planning process of NIDRR
5. To stimulate multicenter collaboration, sharing of resources, and implementation of compatible methodology, especially among centers conducting similar research

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The National Invitational Meeting on Medical Rehabilitation Research was extremely successful in bringing together the present cadre of rehabilitation researchers funded through NIDRR and allowing them to interact and develop recommendations for research priorities, consensus panels, and multicenter collaboration through the sharing of ideas, knowledge, and planning strategies along with NIDRR. Attendees were organized into three groups: Brain Injury, Spinal Cord Injury, and General Medical Sciences. Each group met and developed a detailed “document” outlining its findings and recommendations. It is hoped that proceedings from the meeting will provide a basis for future NIDRR research planning and dissemination.

The Brain Injury work group consisted of professionals from four rehabilitation research and training centers, five model systems, four research training programs, and two related brain injury research projects. The Brain Injury work group report was divided into five main subdivisions: general scope of the work group, research priorities, consensus conference topics, miscellaneous issues, and research summaries. This article briefly reviews the first two areas covered in the work group report to provide readers with a sense of the current breadth of research work in the field of brain injury rehabilitation.

The research areas encompassed in the Brain Injury work group included any acquired form of brain dysfunction, including traumatic brain injury, encephalopathy (toxic, anoxic, metabolic), and space-occupying lesions (tumors, subdurals, and so forth). Neuropsychiatric and neurodevelopmental disorders were deemed important areas for further discussion but beyond the scope and expertise of the work group participants.

Participants developed a set of criteria for developing NIDRR research agenda recommendations and ideas for consensus conference topics based on three main factors:

1. Potential to lead to empowerment
2. “Researchability”—feasible to address, builds on a theory, or demonstrates a model

3. Consideration of social ramifications/costs—financial and otherwise

## RESEARCH PRIORITIES

Research priorities were subclassified into three main categories: General Issues, Neuromedical Issues, and Psychological and Behavioral Issues.

### General Issues

**Research issue.** Epidemiology of traumatic brain injury. **Justification.** Current research suggests that the incidence and prevalence of traumatic brain injury is overestimated. Accurate epidemiological research is critical in assuring that adequate but not excessive resources are provided to this patient population.

**Research issue.** Delineation of the types of services available to different persons with brain injury. **Justification.** Gaps in the continuum of care must be identified and remediated.

**Research issue.** Evaluation of treatment program efficacy. **Justification.** Before one can argue to provide specific services, we must be able to objectively document that these services affect overall outcome in terms of neurological and/or functional recovery.

**Research issue.** Development of reliable, valid, and sensitive holistic assessment approaches. **Justification.** Measures must be valid and reliable. Measurement techniques must be functionally oriented.

**Research issue.** Establish a basic science foundation for brain injury rehabilitation. **Justification.** There must be development and strengthening of a basic science knowledge foundation in this research arena to provide a framework for the advancement of human research and clinical care.

**Research issue.** Define the needs of the pediatric brain injury population and develop mechanisms to meet these needs. **Justification.** Given the high incidence of pediatric brain injury and the unique aspects of this patient population, delineation of patient needs and ways to meet these needs is critical.

**Research issue.** Define the needs of the geriatric brain injury population and develop mechanisms to meet these needs. **Justification.** Given the incidence of geriatric brain injury and the unique aspects of this patient population, delineation of patient needs and ways to meet these needs is critical.

**Research issue.** Define the needs of persons with mild brain injury and develop mechanisms to meet these needs. **Justification.** Given the incidence of mild brain injury and the unique aspects of this patient population, delineation of patient needs and ways to meet these needs is critical.

**Research issue.** Brain injury prevention methods and their efficacy. **Justification.** Improvement in the prevention of brain injury would assist in minimizing the personal and societal burdens associated with brain injury, whether initial or recurrent.

**Research issue.** Prognostic indicators of rehabilitation outcome. **Justification.** Better prognostic indicators would allow for more appropriate utilization of personal and societal resources.

**Research issue.** Concomitant spinal cord injury and traumatic brain injury. **Justification.** Given the implications of this dual disability, appropriate delineation of incidence and most effective rehabilitation interventions are critical.

### Neuromedical Issues

**Research issue.** Efficacy of "coma arousal" therapy. **Justification.** Given the widespread use of this intervention and the relative lack of scientific evidence for its efficacy, methodologically sound research must be carried out to assess efficacy and, additionally, to define appropriate care for this patient population.

**Research issue.** Predictors of recovery from prolonged unconsciousness following brain injury. **Justification.** Better predictive capability will allow for more appropriate utilization of personal and societal resources in allocating care and providing information regarding short term and long term outcome.

**Research issue.** Clinical indicators for use of anticonvulsants to prevent seizures following

brain injury. **Justification.** Better predictors of seizure risk will allow for more appropriate utilization of anticonvulsant drugs with regard to clarifying issues regarding seizure prophylaxis, addressing issues of seizure suppression versus prevention, and clarifying the psychomotor side effect profiles of these drugs in persons with brain injury.

**Research issue.** Early predictors of functional outcomes for all age groups. **Justification.** Better predictive capability will allow for more appropriate utilization of personal and societal resources in allocating care and providing information regarding short term and long term outcome.

**Research issue.** Assessment and rehabilitative care of persons with prolonged unconsciousness. **Justification.** Appropriate clinical evaluation and rehabilitative intervention in this patient population is critical in order to diagnose and treat conditions that may be limiting neurological and functional recovery or contributing to short term or long term morbidity or mortality.

**Research issue.** Application of imaging methods, including nuclear magnetic spectroscopy and positron emission tomography, to the field of brain injury rehabilitation. **Justification.** Better and novel utilization of "nonrehabilitative" diagnostic modalities may allow for improvement in diagnosis and treatment of the sequelae associated with brain injury.

**Research issue.** Investigation of the neural basis of recovery from brain injury. **Justification.** Improvement in our understanding of the neural basis for both neurological and functional recovery will allow for more effective early and late treatment interventions, ultimately resulting in improved outcomes.

**Research issue.** Investigation of pharmacological approaches to brain injury rehabilitation. **Justification.** Delineation of the benefits and potential adverse effects of acute, subacute, and chronic pharmacological intervention on neurological recovery and function after brain injury is critical in maximizing the resources presently available in our rehabilitative armamentarium.

## Psychological and Behavioral Issues

**Research issue.** Determination of effective models for community integration. **Justification.** Ultimately, the ability of individuals to reintegrate into the community at large is a major determinant of the efficacy of rehabilitation efforts.

**Research issue.** Determination of effective models for optimizing family and support system functioning. **Justification.** Maintenance of the family unit and external support systems has proven to be a critical link in optimizing rehabilitation outcomes.

**Research issue.** Determination of effective models for vocational rehabilitation. **Justification.** Although multiple models for vocational rehabilitation exist, little is known regarding the relative efficacy of the various paradigms, nor is there adequate knowledge regarding what paradigm may best suit a particular set of cognitive-behavioral and/or neuropsychological deficits.

**Research issue.** Determination of cognitive remediation efficacy. **Justification.** Given the variety of remediation methodologies presently being utilized to address cognitive deficits, it is critical to determine what, if any, of the available interventions, i.e., computer based versus more functionally oriented cognitive remediation, are most effective for particular types of cognitive deficits.

**Research issue.** Determination and evaluation of models for addressing sexuality issues. **Justification.** Given the presumed incidence of sexuality issues following brain injury, it is of utmost importance to define effective intervention strategies for dealing with genital and nongenital sexual dysfunction, as well as the psychobehavioral issues related to this functional area.

**Research issue.** Prevention and treatment of substance abuse. **Justification.** Secondary problems due to ongoing substance abuse or initiation of substance abuse following brain injury are critical issues to be addressed as early as possible in order to initiate aggressive treatment and minimize associated morbidity.

**Research issue.** Enhancement of neurobehavioral function. **Justification.** Given the

magnitude and functional implications of neurobehavioral deficits following brain injury, it is critical to assess treatment strategies, both non-pharmacological and pharmacological, to minimize associated functional deficits.

**Research issue.** Enhancement of psychosocial function. **Justification.** Quality of life is largely determined by the status of one's psychosocial existence; therefore, any intervention potentially enhancing this aspect of life has an overall effect on the individual, family, and society.

**Research issue.** Predictive validity of cognitive assessment for functioning in the individual's environment. **Justification.** The relation of neuropsychological assessment to day-to-day functional performance must be clarified to optimize utilization of assessment information.

**Research issue.** Theoretical basis of preinjury and postinjury cognitive functioning. **Justification.** Better delineation of cognitive functioning is critical to understanding cognitive recovery in general, and specifically, the potential mechanisms/benefits of cognitive remediation.

**Research issue.** Determine effective internal and external cognitive compensatory mechanisms. **Justification.** To fully maximize an individual's capacity to function in the external environment, it is critical to develop an array of compensatory strategy mechanisms for cognitive deficits.

**Research issue.** Cost-effective methods of transportation for persons with traumatic brain injury. **Justification.** Provisions must be made to allocate resources to individuals with traumatic brain injury so that they may engage in vocational, avocational, and daily living activities in a cost-efficient manner that is minimally burdensome to family and society.

**Research issue.** Cost-effective methods to assess driver safety after brain injury. **Justification.** Provisions must be made to develop cost-efficient, sensitive, and reliable driver assessment protocols to ensure client and general public safety.

**Research issue.** Effects of aging on persons with brain injury. **Justification.** Given the known changes associated with the normal

aging process and the fact that more is known regarding younger persons with brain injury, the exact effects of aging on the decreased neural reserve associated with brain injury must be clarified.

**Research issue.** Effective models of intervention and service delivery for aging persons with brain injury. **Justification.** Once issues regarding the effects of aging on persons with brain injury have been delineated, service delivery models to address these needs must be developed and implemented.

**Research issue.** Group intervention methods. **Justification.** There are many disputes re-

garding the relative efficacy of individual versus group treatment methodologies. Given the cost advantages of group treatment modalities, their relative efficacy must be more clearly defined.

The final report of the Brain Injury work group also includes summaries of all present research activities and individual project directors' names, affiliations, addresses, and telephone numbers. The full meeting report is available through the Rehabilitation Research and Training Center at the Medical College of Virginia; telephone (804) 786-7290; fax (804) 371-6340.