

DEPARTMENT OF EDUCATION**National Institute on Disability and Rehabilitation Research—Disability and Rehabilitation Research Projects and Centers Program—Disability Rehabilitation Research Projects (DRRPs) and Rehabilitation Engineering Research Centers (RERCs)**

AGENCY: Office of Special Education and Rehabilitative Services, Department of Education.

ACTION: Notice of proposed priorities for DRRPs and RERCs.

SUMMARY: The Assistant Secretary for Special Education and Rehabilitative Services proposes certain funding priorities for the Disability and Rehabilitation Research Projects and Centers Program administered by the National Institute on Disability and Rehabilitation Research (NIDRR). Specifically, this notice proposes four priorities for DRRPs and seven priorities for RERCs. The Assistant Secretary may use these priorities for competitions in fiscal year (FY) 2007 and later years. We take this action to focus research attention on areas of national need. We intend these priorities to improve rehabilitation services and outcomes for individuals with disabilities.

DATES: We must receive your comments on or before October 19, 2006.

ADDRESSES: Address all comments about these proposed priorities to Donna Nangle, U.S. Department of Education, 400 Maryland Avenue, SW., room 6030, Potomac Center Plaza, Washington, DC 20204–2700. If you prefer to send your comments through the Internet, use the following address: donna.nangle@ed.gov.

You must include the term “Proposed Priorities for DRRPs and RERCs” in the subject line of your electronic message.

FOR FURTHER INFORMATION CONTACT:

Donna Nangle or Lynn Medley.
Telephone: (202) 245–7462 (Donna Nangle) or (202) 245–7338 (Lynn Medley).

If you use a telecommunications device for the deaf (TDD), you may call the Federal Relay Service (FRS) at 1–800–877–8339.

Individuals with disabilities may obtain this document in an alternative format (e.g., Braille, large print, audiotope, or computer diskette) on request to the contact person listed under **FOR FURTHER INFORMATION CONTACT**.

SUPPLEMENTARY INFORMATION: This notice of proposed priorities is in concert with President George W.

Bush’s New Freedom Initiative (NFI) and NIDRR’s Final Long-Range Plan for FY 2005–2009 (Plan). The NFI can be accessed on the Internet at the following site: <http://www.whitehouse.gov/infocus/newfreedom>. The Plan, which was published in the **Federal Register** on February 15, 2006 (71 FR 8165), can be accessed on the Internet at the following site: <http://www.ed.gov/about/offices/list/osers/nidrr/policy.html>.

Through the implementation of the NFI and the Plan, NIDRR seeks to: (1) Improve the quality and utility of disability and rehabilitation research; (2) foster an exchange of expertise, information, and training to facilitate the advancement of knowledge and understanding of the unique needs of traditionally underserved populations; (3) determine best strategies and programs to improve rehabilitation outcomes for underserved populations; (4) identify research gaps; (5) identify mechanisms of integrating research and practice; and (6) disseminate findings.

One of the specific goals established in the Plan is for NIDRR to publish all of its proposed priorities, and following public comment, final priorities, annually, on a combined basis. Under this approach, NIDRR’s constituents can submit comments at one time rather than at different times throughout the year, and NIDRR can move toward a fixed schedule for competitions and more efficient grant-making operations. This notice proposes priorities that NIDRR intends to use for DRRP and RERC competitions in FY 2007 and possibly later years. However, nothing precludes NIDRR from publishing additional priorities, if needed. Furthermore, NIDRR is under no obligation to make an award for each of these priorities. The decision to make an award will be based on the quality of applications received and available funding.

For FY 2007 competitions using priorities that already have been established and for which publication of a notice of proposed priority is unnecessary (e.g., competitions for Field-Initiated Projects, Advanced Rehabilitation Research Training Projects, Fellowships, and Small Business Innovation Research Projects), NIDRR has published or will publish notices inviting applications. In addition to this notice, on June 7, 2006, NIDRR published a separate notice of proposed priorities for a DRRP on Vocational Rehabilitation: Transition Services that Lead to Competitive Employment Outcomes for Transition-Age Individuals With Blindness or Other Visual Impairment (71 FR 32938).

More information on these other projects and programs that NIDRR intends to fund in FY 2007 can be found on the Internet at the following site: <http://www.ed.gov/fund/grant/apply/nidrr/priority-matrix.html>.

Invitation to Comment: We invite you to submit comments regarding these proposed priorities. To ensure that your comments have maximum effect in developing the notice of final priorities, we urge you to identify clearly the specific proposed priority or topic that each comment addresses.

We invite you to assist us in complying with the specific requirements of Executive Order 12866 and its overall requirement of reducing regulatory burden that might result from these proposed priorities. Please let us know of any further opportunities we should take to reduce potential costs or increase potential benefits while preserving the effective and efficient administration of the program.

During and after the comment period, you may inspect all public comments about these proposed priorities in room 6030, 550 12th Street, SW., Potomac Center Plaza, Washington, DC, between the hours of 8:30 a.m. and 4 p.m., Eastern time, Monday through Friday of each week except Federal holidays.

Assistance to Individuals With Disabilities in Reviewing the Rulemaking Record

On request, we will supply an appropriate aid, such as a reader or print magnifier, to an individual with a disability who needs assistance to review the comments or other documents in the public rulemaking record for these proposed priorities. If you want to schedule an appointment for this type of aid, please contact the person listed under **FOR FURTHER INFORMATION CONTACT**.

We will announce the final priorities in one or more notices in the **Federal Register**. We will determine the final priorities after considering responses to this notice and other information available to the Department. This notice does not preclude us from proposing or using additional priorities, subject to meeting applicable rulemaking requirements.

Note: This notice does *not* solicit applications. In any year in which we choose to use these proposed priorities, we invite applications through a notice in the **Federal Register**. When inviting applications we designate the priorities as absolute, competitive preference, or invitational. The effect of each type of priority follows:

Absolute priority: Under an absolute priority, we consider only applications that meet the priority (34 CFR 75.105(c)(3)).

Competitive preference priority: Under a competitive preference priority, we give competitive preference to an application by either (1) Awarding additional points, depending on how well or the extent to which the application meets the competitive preference priority (34 CFR 75.105(c)(2)(i)); or (2) selecting an application that meets the competitive preference priority over an application of comparable merit that does not meet the priority (34 CFR 75.105(c)(2)(ii)).

Invitational priority: Under an invitational priority, we are particularly interested in applications that meet the invitational priority. However, we do not give an application that meets the invitational priority a competitive or absolute preference over other applications (34 CFR 75.105(c)(1)).

Priorities: In this notice, we are proposing 4 priorities for DRRPs and 7 priorities for RERCs.

For DRRPs, the proposed priorities are:

- Priority 1—National Data and Statistical Center for the Burn Model Systems.
- Priority 2—Burn Model Systems (BMS) Centers.
- Priority 3—Inclusive Emergency Evacuation of Individuals with Disabilities.
- Priority 4—Traumatic Brain Injury Model Systems (TBIMS) Centers.

For RERCs, the proposed priorities are:

- Priority 5—RERC for Spinal Cord Injury.
- Priority 6—RERC for Recreational Technologies and Exercise Physiology Benefiting Individuals with Disabilities.
- Priority 7—RERC for Translating Physiological Data into Predictions for Functional Performance.
- Priority 8—RERC for Accessible Medical Instrumentation.
- Priority 9—RERC for Workplace Accommodations.
- Priority 10—RERC for Rehabilitation Robotics and Telemanipulation Systems.
- Priority 11—RERC for Emergency Management Technologies.

Disability and Rehabilitation Research Projects (DRRP) Program

The purpose of the DRRP program is to plan and conduct research, demonstration projects, training, and related activities to develop methods, procedures, and rehabilitation technology that maximize the full inclusion and integration into society, employment, independent living, family support, and economic and social self-sufficiency of individuals with disabilities, especially individuals with the most severe disabilities, and to improve the effectiveness of services authorized under the Rehabilitation Act of 1973, as amended. DRRPs carry out

one or more of the following types of activities, as specified and defined in 34 CFR 350.13 through 350.19: research, development, demonstration, training, dissemination, utilization, and technical assistance.

An applicant for assistance under this program must demonstrate in its application how it will address, in whole or in part, the needs of individuals with disabilities from minority backgrounds (34 CFR 350.40(a)). The approaches an applicant may take to meet this requirement are found in 34 CFR 350.40(b). In addition, NIDRR intends to require all DRRP applicants to meet the requirements of the *General Disability and Rehabilitation Research Projects (DRRP) Requirements* priority that it published in a notice of final priorities in the **Federal Register** on April 28, 2006 (71 FR 25472).

Additional information on the DRRP program can be found at: <http://www.ed.gov/rschstat/research/pubs/res-program.html#DRRP>.

Proposed Priorities

Priority 1—National Data and Statistical Center for the Burn Model Systems Background

It is estimated that there are more than 1 million burn injuries in the United States each year. Approximately 700,000 of these burn injuries are treated in emergency departments annually, and 54,000 are severe enough to require hospitalization (Esselman *et al.*, 2006; American Burn Association, 2002).

In recent years, burn survivability has increased dramatically. This improvement in survival rates has brought rehabilitation issues to the forefront of care for burn survivors and led to increased demands for research-based knowledge about the post-acute experiences and needs of burn survivors (Esselman *et al.*, 2006).

NIDRR created the Burn Injury Rehabilitation Model Systems of Care (BMS) in 1994 to provide leadership in rehabilitation as a key component of exemplary burn care and to advance the research base of rehabilitation services for burn survivors. The centers funded under the BMS program (BMS Centers) establish and carry out projects that provide a coordinated system of care including emergency care, acute care management, comprehensive inpatient rehabilitation, and long-term interdisciplinary follow-up services. In addition, the BMS program carries out innovative projects for the delivery, demonstration, and evaluation of comprehensive medical, vocational, and

other rehabilitation services to meet the wide range of needs of individuals with burn injury.

The BMS Centers have developed a longitudinal database that contains information on approximately 4,700 people injured since 1994 (BMS Database). The BMS Database is emerging as an important source of information about the characteristics and life course of individuals with burn injury. The BMS Database can be used to examine specific outcomes of burn injury. NIDRR seeks to continue and build upon this data source by funding a National Data and Statistical Center for the BMS (National BMS Data Center) that will maintain the BMS Database and improve the quality of information that is entered into it.

The BMS Database is a collaborative project in which all of the BMS Centers are required to participate. The data for the BMS Database are collected by the BMS Centers. The directors of the BMS Centers, including the National BMS Data Center, in consultation with NIDRR, determine the parameters of the BMS Database, including the number and type of variables to be examined, the criteria for including BMS patients in the database, and the frequency and timing of data collection.

The specifications of the BMS Database as it is currently implemented can be obtained from the BMS Database Coordination Center. The BMS Database Coordination Center may be contacted on the World Wide Web at <http://bms-dcc.uchsc.edu/>.

References

- ABA National Burn Repository Report, 2002. <http://www.ameriburn.org/pub/NBR.htm>.
- Esselman, P., Thombs, B., Fauerbach, J., Magyar-Russell, G., & Price, M. (2006). Burn State of the Science Review. In Press. American Journal of Physical Medicine and Rehabilitation.

Proposed Priority

The Assistant Secretary for Special Education and Rehabilitative Services proposes a priority for the establishment of a National Data and Statistical Center for the Burn Model Systems (National BMS Data Center). The National BMS Data Center must advance medical rehabilitation by increasing the rigor and efficiency of scientific efforts to assess the experience of individuals with burn injury. To meet this priority, the National BMS Data Center's research and technical assistance must be designed to contribute to the following outcomes:

- (a) Maintenance of a national longitudinal database (BMS Database)

for data submitted by each of the Burn Model Systems centers (BMS Centers). This database must provide for confidentiality, quality control, and data-retrieval capabilities, using cost-effective and user-friendly technology.

(b) High-quality, reliable data in the BMS Database. The National BMS Data Center must contribute to this outcome by providing training and technical assistance to BMS Centers on subject retention and data collection procedures, data entry methods, and appropriate use of study instruments, and by monitoring the quality of the data submitted by the BMS Centers.

(c) Rigorous research conducted by BMS Centers. To help in the achievement of this outcome, the National BMS Data Center must make statistical and other methodological consultation available for research projects that use the BMS Database, as well as center-specific and collaborative projects of the BMS program.

(d) Improved efficiency of the BMS Database operations. The National BMS Data Center must pursue strategies to achieve this outcome, such as collaborating with the National Data and Statistical Center for Traumatic Brain Injury Model Systems, the National Data and Statistical Center for Spinal Cord Injury Model Systems, and the Model Systems Knowledge Translation Center.

Priority 2—Burn Model System (BMS) Centers

Background

The American Burn Association (ABA) reported that about 54,000 Americans, one-third under age 20, are hospitalized for severe burn treatment every year. Of this number, 5,500 die (ABA National Burn Repository Report, 2002; <http://www.ameriburn.org/pub/NBR.htm>). Burn injury is a catastrophic event that can result in significant impairment of an individual's physical function. Relatively little has been written about physical rehabilitation of individuals following a burn injury (Sliwa *et al.*, 2005).

NIDRR created the Burn Injury Rehabilitation Model Systems of Care (BMS) in 1994 to provide leadership in rehabilitation as a key component of exemplary burn care and to advance the research base of rehabilitation services for burn survivors. The centers funded under the BMS program (BMS Centers) establish and carry out projects that provide a coordinated system of care including emergency care, acute care management, comprehensive inpatient rehabilitation, and long-term interdisciplinary follow-up services. In addition, the BMS program carries out

innovative projects for the delivery, demonstration, and evaluation of comprehensive medical, vocational, and other rehabilitation services to meet the wide range of needs of individuals with burn injury.

Currently, four BMS Centers conduct research activities designed to improve rehabilitative and pharmacological interventions that can help optimize levels of community participation, employment, and overall quality of life for individuals with burn injury. Each center provides comprehensive rehabilitation services to individuals with burn injury and conducts burn research, including clinical research and the analysis of standardized data in collaboration with other related projects. The BMS Centers have developed a longitudinal database that contains information on over 3,046 adults and more than 1,602 children (BMS Database). Additional information on the BMS Database funded in 1998 can be found at <http://bms-dcc.uchsc.edu>.

Rehabilitation issues of concern to NIDRR include methods of measuring functional outcomes following burn injury. Recently, it is reported that the most widely used assessment of function following injury, the functional independence measure (FIM), may not be sufficient to measure functional outcomes following burn injuries (Sliwa *et al.*, 2005). NIDRR is also concerned about such issues as the effectiveness of specific rehabilitation interventions; psychosocial adjustment following burn injury; cognitive functioning following burn injury; and long-term outcomes following burn injury, including community integration and return to work.

In 2005, NIDRR conducted a review of its current BMS program. It is NIDRR's intent that, through funding of BMS Centers under the following proposed priority, the BMS program will serve as a platform for multi-site research that contributes to the formulation of practice guidelines to improve rehabilitation outcomes for individuals with burn injury.

References

- ABA National Burn Repository Report, 2002. <http://www.ameriburn.org/pub/NBR.htm>.
- Sliwa, J. A., Heinemann, A., Semik, P. (2005). Inpatient Rehabilitation Following Burn Injury: Patient Demographics and Functional Outcomes. *Archives of Physical Medicine and Rehabilitation*, 86: 1920–1923.
- Raymond, I., Ancoli-Israel, S., Choiniere, M. (2004). Sleep

Disturbances, Pain, and Analgesia in Adults Hospitalization for Burn Injuries. *Sleep Medicine*, 5(6): 551–559.

Proposed Priority

The Assistant Secretary for Special Education and Rehabilitative Services proposes a priority for the funding of Burn Model Systems (BMS) centers (BMS Center) under the Disability and Rehabilitation Research Projects (DRRP) Program to conduct research that contributes to evidence-based rehabilitation interventions and clinical as well as practice guidelines that improve the lives of individuals with burn injury. Each BMS Center must—

(a) Contribute to continued assessment of long-term outcomes of burn injury by enrolling at least 30 subjects per year into the national longitudinal database for BMS data maintained by the National Data and Statistical Center for the BMS, following established protocols for the collection of enrollment and follow-up data on subjects;

(b) Contribute to improved outcomes for individuals with burn injury by proposing one collaborative research module project and participating in at least one collaborative research module project, which may range from pilot research to more extensive studies; and

(c) Contribute to improved long-term outcomes of individuals with burn injury by conducting no more than two site-specific research projects to test innovative approaches that contribute to rehabilitation interventions and evaluating burn injury outcomes in accordance with the focus areas identified in NIDRR's Final Long-Range Plan for FY 2005–2009 (Plan). Applicants who propose more than two site-specific projects will be disqualified.

In carrying out these activities, each BMS Center may select from the following research domains related to specific areas of the Plan: Health and function, employment, participation and community living, and technology for access and function.

In addition, each BMS Center must—

(1) Provide a multidisciplinary system of rehabilitation care specifically designed to meet the needs of individuals with burn injury. The system must encompass a continuum of care, including emergency medical services, acute care services, acute medical rehabilitation services, and post-acute services; and

(2) Coordinate with the NIDRR-funded Model Systems Knowledge Translation Center to provide scientific results and information for

dissemination to clinical and consumer audiences.

Priority 3—Inclusive Emergency Evacuation of Individuals With Disabilities

Background

Executive Order 13347, Individuals with Disabilities in Emergency Preparedness, directs the Federal Government to protect the safety and security of individuals with disabilities in disasters. Legal requirements related to nondiscrimination, architectural and communications access, technology, transportation, and other areas, such as those contained in the Americans with Disabilities Act of 1990, as amended, 42 U.S.C. 12101 *et seq.* (ADA) and relevant court decisions, apply in emergency situations as well.

Incorporating disability considerations into emergency evacuation, planning, preparation, and other activities is critical. Currently, there is insufficient evidence on demonstrating the most effective ways to ensure the safety of individuals with disabilities during emergency situations. For example, many individuals with disabilities rely on elevators, accessible transportation, and accessible communications, all of which can be compromised during disasters or other emergency situations (Executive Order 13347, Annual Report, 2005). Additional research is needed on approaches to evacuation that include the evacuation of individuals with disabilities (e.g., physical, sensory, mental impairments).

A study by the National Council on Disability states that, while there is a wealth of anecdotal reports by the disability community about their experiences in disaster situations, there is scarce research related to people with disabilities in disaster planning, mitigation, preparedness, response, and recovery. This study also reports that: “a common theme emerging after 9/11 is there are virtually no empirical data on the safe and efficient evacuation of persons with disabilities in emergency planning” (National Council on Disability, 2005). Increased knowledge about devices, systems, plans, standards, and the incorporation of disability considerations into mainstream emergency management initiatives are needed in order to build system capacity and improve outcomes for individuals with disabilities in emergencies.

References

Americans with Disabilities Act of 1990, as amended, 42 U.S.C. 12101 *et seq.*

National Council on Disability, Saving Lives: Including People with Disabilities in Emergency Planning. April 2005. Available at: <http://www.ncd.gov>.

U.S. Department of Homeland Security, Individuals with Disabilities in Emergency Preparedness: Executive Order 13347, Annual Report. July 2005. Available at: <http://www.dhs.gov/disabilitypreparednessicc>.

Proposed Priority

The Assistant Secretary for Special Education and Rehabilitative Services proposes a priority for a Disability Rehabilitation Research Project (DRRP) on Inclusive Emergency Evacuation of Individuals with Disabilities to conduct research that contributes to the development of evidence-based emergency evacuation procedures to improve outcomes for individuals with disabilities. Under this priority, the DRRP must be designed to contribute to the following outcomes:

(a) Increased evidence-based knowledge about the inclusive evacuation of individuals with disabilities from one or more of the following areas: buildings, transportation systems, and geographic locations (e.g., cities and States). The DRRP must contribute to this outcome by—(1) Synthesizing the current evidence base in one or more of the following areas: disability-related evacuation devices, plans, exercises, protocols, models, systems, networks, and standards; (2) identifying, for the areas identified in (a)(1) of this priority, the components and specifications needed for reliable, usable, accessible, safe, and effective evacuation of individuals with disabilities; and (3) assessing the degree to which the areas selected in (a)(1) of this priority contains the components or specifications identified in (a)(2) of this priority.

(b) Increased implementation of disability-related evacuation solutions within existing emergency management initiatives. The DRRP must contribute to this outcome by—(1) Examining barriers and facilitators to effective implementation of disability-related evacuation solutions within existing emergency management initiatives (including but not limited to communication between key stakeholders and attitudinal barriers); and (2) working with the emergency management community to propose solutions to the barriers identified in

accordance with paragraph (b)(1) of this priority.

In addition to the above outcomes, applicants must:

- Define, in their applications, the parameters and units of analysis for their proposed activities. Applications must include a description of each of the following: (1) Type of evacuation (i.e., evacuation from buildings, transportation systems, geographic locations such as cities or States); (2) target population (e.g., with physical, sensory, mental impairments); and (3) type of response (e.g., devices, plans, exercises, protocols, models, systems, networks, or standards).

- Demonstrate in their applications how they plan to implement a sustained, meaningful, and integrated collaboration throughout the project with key stakeholders, including but not limited to the following: (1) Disability and aging advocates, organizations, disability subject matter experts, and qualified individuals with disabilities; (2) fire engineers, homeland security and preparedness personnel, and other mainstream emergency management professionals and associations; (3) industry, standard-setting organizations, and other relevant stakeholders involved in standards development; (4) researchers (including researchers working on projects funded by NIDRR, other government agencies, and researchers in the private sector); and (5) relevant Federal agencies, including but not limited to those participating in the Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities.

Priority 4—Traumatic Brain Injury Model Systems (TBIMS) Centers

Background

The Centers for Disease Control and Prevention (CDC) report that at least 1.4 million people sustain a traumatic brain injury (TBI) in the United States each year (Langlois, Rutland-Brown, & Thomas, 2004). Of these, approximately 50,000 die, 235,000 are hospitalized, and 1.1 million are treated and released from emergency departments. These estimates do not include those individuals who sustained a TBI and did not seek medical care or were seen only in private doctors' offices. The three leading causes of TBI are motor vehicle/traffic collisions, falls and assaults.

Disabilities resulting from TBI depend on several factors such as the severity and location of the injury, length of impaired consciousness, age and general health of the patient, and the intensity of rehabilitation services (Cifu, Kreutzer,

Kolakowsky-Hayner, Marwitz & Englander, 2003; Dikmen, Machamer, Powell & Temkin, 2003; Sarajuuri, Kaipio, Koskinen, Niemela, Servo & Vilkki, 2005). Common disabilities resulting from TBI include problems with cognition, sensory processing, communication, and behavioral or mental health; and some TBI survivors develop long-term medical complications (National Institute of Neurological Disorders and Stroke, 2002). CDC reports that each year an estimated 80,000 to 90,000 Americans sustain TBI resulting in permanent disability. At least 5.3 million Americans have a long-term or lifelong need for help to perform activities of daily living as a result of TBI (Thurman, Alverson, Dunn, Guerrero, & Snizek, 1999).

The Traumatic Brain Injury Model Systems (TBIMS) program was created by NIDRR in 1987 to demonstrate the benefits of a coordinated system of neurotrauma and rehabilitation care and to conduct innovative research on all aspects of care for those who sustain TBI. NIDRR currently funds 16 TBIMS centers throughout the United States. These centers provide comprehensive systems of brain injury care to individuals who sustain TBI and conduct TBI research, including clinical research and the analysis of standardized data in collaboration with other related projects. The mission of the TBIMS is to improve the lives of persons who experience TBI, and of their families and communities by creating and disseminating new knowledge about the natural course of TBI and rehabilitation treatment and outcomes following TBI.

For purposes of the TBIMS, TBI is defined as damage to brain tissue caused by an external mechanical force as evidenced by loss of consciousness or post-traumatic amnesia due to brain trauma or by objective neurological findings that can be reasonably attributed to TBI on physical examination or mental status examination. Both penetrating and non-penetrating wounds that fit this criteria are included, but, primary anoxic encephalopathy is not.

Each TBIMS center funded under this program should be designed to offer a multidisciplinary system for providing rehabilitation services specifically designed to meet the special needs of individuals with TBI. These services span the continuum of treatment from acute care through community re-entry. TBIMS centers engage in initiatives and new approaches and maintain close working relationships with other governmental and non profit

institutions and organizations to coordinate scientific efforts, encourage joint planning, and promote the interchange of data and reports among TBI researchers. As part of these cooperative efforts, TBIMS centers participate in collaborative research module projects, which range from pilot research to more extensive studies.

A committee consisting of the individual TBIMS project program directors has, since its inception, guided the TBIMS program. This group meets bi-annually in Washington, DC, and, in consultation with NIDRR, develops and oversees the policies of the TBIMS. NIDRR intends for the work of this group to continue.

Since 1989, the TBIMS centers have collected and contributed information on common data elements for a centralized TBIMS database, which is maintained through a NIDRR-funded grant for a National Data and Statistical Center for the TBIMS. (Additional information on the TBIMS database can be found at <http://tbindc.org>). The TBI National Data and Statistical Center for the TBIMS coordinates data collection, manages the TBIMS database, and provides statistical support to the model systems projects. To date, TBIMS centers have contributed 5,756 cases to the TBIMS database, with follow up data extending to 15 years post injury.

References

- Cifu, D.X., Kreutzer, J.S., Kolakowsky-Hayner, S.A., Marwitz, J.H., & Englander, J. (2003). The Relationship Between Therapy Intensity and Rehabilitative Outcomes after Traumatic Brain Injury: A Multicenter Analysis. *Archives of Physical Medicine and Rehabilitation*, 84(10): 1441–8.
- Dikmen, S.S., Machamer, J.E., Powell, J.M., & Temkin, N.R. (2003). Outcome 3 to 5 Years After Moderate to Severe Traumatic Brain Injury. *Archives of Physical Medicine and Rehabilitation*, 84(10): 1449–57.
- Langlois, J.A., Rutland-Brown, W., & Thomas, K.E. (2004). *Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations, and Deaths*. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.
- National Institute of Neurological Disorders and Stroke (NINDS). (2002, February). *Traumatic Brain Injury: Hope Through Research*. Bethesda, MD: National Institute of Health. NIH Publication No. 02–2478. Retrieved February 2, 2006, from the NINDS Web site: http://www.ninds.nih.gov/disorders/tbi/detail_tbi.htm.
- Sarajuuri, J.M., Kaipio, M.L., Koskinen, S.K., Niemela, M.R., Servo, A.R., & Vilkki, J.S. (2005). Outcome of a Comprehensive Neurorehabilitation Program for Patients with Traumatic Brain Injury. *Archives of Physical Medicine and Rehabilitation*, 86(12): 2296–302.
- Thurman, D.J., Alverson, C.A., Dunn, K.A., Guerrero, J., & Snizek, J.E. (1999). Traumatic Brain Injury in the United States: A Public Health Perspective. *Journal of Head Trauma Rehabilitation*, 14(6): 602–615.

Proposed Priority

The Assistant Secretary for Special Education and Rehabilitative Services proposes a priority for Traumatic Brain Injury Model Systems (TBIMS) centers under the Disability and Rehabilitation Research Projects (DRRP) program to conduct research that contributes to evidence-based rehabilitation interventions which improve the lives of individuals with traumatic brain injury (TBI). Each TBIMS center must contribute to the following outcomes:

(a) Continued assessment of long-term outcomes of TBI by enrolling at least 35 subjects per year into the longitudinal portion of the TBIMS database maintained by the National Data and Statistical Center for the TBIMS, following established protocols for the collection of enrollment and follow-up data on subjects.

(b) Improved outcomes for individuals with TBI by proposing one collaborative research module project and participating in at least one collaborative research module project, which may range from pilot research to more extensive studies (At the beginning of the funding cycle, the TBIMS directors, in conjunction with NIDRR, will select specific modules for implementation from the approved applications).

(c) Improved long-term outcomes of individuals with TBI by conducting no more than two site-specific research projects to test innovative approaches that contribute to rehabilitation interventions and evaluating TBI outcomes in accordance with the focus areas identified in NIDRR's Long-Range Plan for FY 2005–2009. Applicants who propose more than two site-specific projects will be disqualified.

In carrying out each of these research activities, each TBIMS Center may select from the following research domains related to specific areas of the Plan: Health and Function, Employment, Participation and Community Living, and Technology for Access and Function.

In addition, each TBIMS Center must—

(1) Provide a multidisciplinary system of rehabilitation care specifically designed to meet the needs of individuals with TBI. The system must encompass a continuum of care, including emergency medical services, acute care services, acute medical rehabilitation services, and post-acute services; and

(2) Coordinate with the NIDRR-funded Model Systems Knowledge Translation Center to provide scientific results and information for dissemination to clinical and consumer audiences.

Rehabilitation Engineering Research Centers Program General Requirements of Rehabilitation Engineering Research Centers (RERCs)

RERCs carry out research or demonstration activities in support of the Rehabilitation Act of 1973, as amended, by—

- Developing and disseminating innovative methods of applying advanced technology, scientific achievement, and psychological and social knowledge to: (a) Solve rehabilitation problems and remove environmental barriers; and (b) study and evaluate new or emerging technologies, products, or environments and their effectiveness and benefits; or
- Demonstrating and disseminating: (a) Innovative models for the delivery of cost-effective rehabilitation technology services to rural and urban areas; and (b) other scientific research to assist in meeting the employment and independent living needs of individuals with severe disabilities; and
- Facilitating service delivery systems change through: (a) The development, evaluation, and dissemination of consumer-responsive and individual and family-centered innovative models for the delivery to both rural and urban areas of innovative cost-effective rehabilitation technology services; and (b) other scientific research to assist in meeting the employment and independence needs of individuals with severe disabilities.

Each RERC must be operated by or in collaboration with one or more institutions of higher education or one or more nonprofit organizations.

Each RERC must provide training opportunities, in conjunction with institutions of higher education and nonprofit organizations, to assist individuals, including individuals with disabilities, to become rehabilitation technology researchers and practitioners.

Additional information on the RERC program can be found at: <http://www.ed.gov/rschstat/research/pubs/index.html>.

www.ed.gov/rschstat/research/pubs/index.html.

Priorities 5, 6, 7, 8, 9, 10, and 11—*Rehabilitation Engineering Research Centers (RERCs) for Spinal Cord Injury (Priority 5), Recreational Technologies and Exercise Physiology Benefiting Individuals With Disabilities (Priority 6), Translating Physiological Data Into Predictions for Functional Performance (Priority 7), Accessible Medical Instrumentation (Priority 8), Workplace Accommodations (Priority 9), Rehabilitation Robotics and Telemanipulation Systems (Priority 10), and Emergency Management Technologies (Priority 11)*

Background

Individuals with disabilities regularly use products developed through rehabilitation and biomedical research to achieve and maintain maximum physical function, live independently, study and learn, and attain gainful employment. The range of engineering research encompasses not only assistive technology but also technology at the systems level (e.g., the built environment, information and communication technologies, and transportation) and technology that interfaces between individuals and systems and is basic to community integration.

The NIDRR RERC program has been a major force in the development of technology to enhance independent function for individuals with disabilities. The RERCs are recognized as national centers of excellence in their respective areas and collectively represent the largest federally supported program responsible for advancing rehabilitation engineering research. For example, the RERC program was an early pioneer in the development of augmentative communication and has been at the forefront of prosthetics and orthotics research for both children and adults. RERCs have played a major role in the development of voluntary standards that the medical equipment and technology industries use when developing wheelchairs, wheelchair restraint systems, information technologies, and the World Wide Web. RERCs also have been a driving force in the development of universal design principles that can be applied to the built environment, information technology, and consumer products.

Advancements in basic biomedical science and technology have resulted in new opportunities to further enhance the lives of individuals with disabilities. Specifically, recent advances in biomaterials research, composite

technologies, information and telecommunication technologies, nanotechnologies, micro electro mechanical systems (MEMS), sensor technologies, and the neurosciences provide a wealth of opportunities for individuals with disabilities and could be incorporated into research focused on disability and rehabilitation.

Through the following proposed priorities, NIDRR intends to fund RERCs that advance rehabilitation engineering in the following research areas: Spinal Cord Injury, Recreational Technologies and Exercise Physiology Benefiting People with Disabilities, Translating Physiological Data into Predictions for Functional Performance, Accessible Medical Instrumentation, Workplace Accommodations, Rehabilitation Robotics and Telemanipulation Systems, and Emergency Management Technologies.

Priority 5—RERC for Spinal Cord Injury

It is estimated that the number of Americans living with traumatic spinal cord injury (SCI) ranges from 222,000 to 285,000, with an incidence of approximately 11,000 new cases each year (Spinal Cord Injury: Facts and Figures at a Glance, 2004).

Technology plays a pivotal role in the lives of individuals with SCI, starting with the onset of injury and continuing into the individual's reintegration into community life (Cooper, 2004). The development of cutting-edge devices and the application of existing technologies such as integrated control systems, robotics, and neuroprosthetics can help individuals with SCI perform activities of daily living and work, and participate in their communities. These devices can enhance the mobility and function of users with SCI, which in turn, aids in the preservation of their overall health. Enhanced mobility, function and overall health are vital to the independence and quality of life of individuals with SCI. Accordingly, NIDRR seeks to fund an RERC that focuses on improving the quality of life of individuals with SCI and promotes health, rehabilitation, independence, and community participation.

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Priority 6—RERC for Recreational Technologies and Exercise Physiology Benefiting Individuals With Disabilities

Individuals with disabilities are generally less likely to be physically active than their non-disabled peers. However, regular physical activity, sports participation, and active recreation are important contributors to the prevention of disease, promotion of health, and maintenance of functional independence for all individuals, including individuals with disabilities. Several studies have demonstrated that many persons with a variety of disabilities benefit from increased levels of physical activity, as evidenced by alterations in various components of their physical fitness (Ada, Dean, Hall, Bampton, Crompton, 2003; Hicks, Martin, Ditor, Latimer, Craven, Bugaresti, McCartney, 2003; Husted, Pham, Hekking, Niederman, 1999; Romberg, Virtanen, Ruutiainen, Aunola, Karppi, Vaara, Surakka, Pohjolainen, Seppanen, 2004).

Accessible recreation requires more than ramps or automatic door openers at buildings containing recreational space. In a recreational facility, equipment and programs themselves contribute to an environment that promotes equal access or creates a barrier to pursuing recreational goals. Recreational equipment needs obvious and easy adjustability, variable range of motion, adequate surrounding space, and transferability (North Carolina Office on Disability and Health (2001)). Furthermore, recreational spaces are in need of accessible points of entry and accessible surfacing (North Carolina Office on Disability and Health (2001)).

Although modifications to recreational equipment have been made, such as swing away seats to allow use from a wheelchair or the addition of Braille instructions, these modifications are not universal and recreational equipment remains a primary barrier to physical activity participation (Rimmer, J.H., Riley, B., Wang, E., Rauworth, A. (2005)). Existing recreational technologies are in need of new features to increase access to and participation in recreational environments by individuals with disabilities. In addition, newly improved and novel recreational technologies need to be researched and tested to demonstrate the degree to which they can increase access to and participation in recreational environments by individuals with disabilities.

Accordingly, NIDRR seeks to fund an RERC that facilitates equitable access to, and safe use of, recreational equipment, facilities, and programs, and will reduce

debilitating secondary conditions associated with disability and sedentary lifestyle.

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Priority 7—RERC for Translating Physiological Data Into Predictions for Functional Performance

The fields of biomedical and rehabilitation engineering have produced and applied a wide variety of instruments and devices to measure the physiological capacity of the human body. Many of these measurement tools, which examine parameters such as range of motion, force, gait, and electrophysiological features, have been applied by physiatrists and other allied professionals in research or practice in physical medicine and rehabilitation (Hesse, *et al.*, 2002; Koontz, *et al.*, 2005; Wimalaratna, *et al.*, 2002).

To realize the potential for these physiological measures to shape clinical practices and services, biomedical

engineers and rehabilitation clinicians must develop methods for translating physiological measures into predictions for functional performance. One example would be translating the results of a strength measure into a prognosis for the capacity to carry out a particular activity of daily living (ADL). NIDRR, therefore, seeks to fund an RERC that develops and evaluates models and methods to determine the relationship between physiological measures and the capacity to perform basic tasks among individuals with disabilities.

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Priority 8—RERC for Accessible Medical Instrumentation

The aim of “The Surgeon General’s Call to Action to Improve the Health and Wellness of Persons with Disabilities” is for people with disabilities to achieve full access to disease prevention and health promotion services (The Surgeon General’s Call to Action to Improve the Health and Wellness of Persons with Disabilities, 2005). Building upon the American with Disability Act of 1990, as amended, mandate of equal access to public accommodations and services, the second of four major goals within the Surgeon General’s call-to-action is to: “Increase knowledge among health care professionals and provide them with tools to screen, diagnose, and treat the whole person with a disability with dignity.”

Many medical devices in use today are not readily accessible to individuals with disabilities. For example, research examining the accessibility of mammography equipment found that inaccessible health care facilities and medical equipment make it less likely that women with disabilities will receive breast cancer screening (Nosek,

2000). In addition, accessibility issues are apparent with many other medical devices such as exam tables, x-ray equipment, rehabilitation equipment, and weight scales (Winters, *et al.*, 2005). Accordingly, NIDRR seeks to fund an RERC that facilitates equitable access to, and use of, healthcare facilities and equipment by people with disabilities.

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Priority 9—RERC for Workplace Accommodations

Individuals with disabilities experience low rates of employment and are less likely to be highly educated than are individuals without disabilities. Despite several national programs and policies that address this disparity, employment rates for people with disabilities have remained stable or declined in the past decade (2003 CPS Employment Rates). The lack of an accessible work environment may partially explain the decline in employment rates among individuals with disabilities.

Functional limitations in areas such as motor functioning, communication, sensation and perception, and cognitive functioning all present barriers to employment and maintenance of employment by people with disabilities (Williams, M., Sabata, D., Zolna, J. (2006)). Modifications in the work environment often remove or reduce these barriers. Examples of modifications include ramps, automatic door openers, alternate computer systems, voice output devices for persons with visual impairments, and customized desks and worktables. Evaluating the effectiveness of existing individualized accommodations and new technologies that can potentially be integrated into the design of work environments also may help to reduce

employment barriers. Moreover, the need persists for more comprehensive empirical evidence about the human factors of the workplace environment and workplace technology used by people with disabilities. For example, workplace and task assessment using ergonomic, anthropometric, and kinematic analysis is needed for individuals with disabilities. In addition, new tools for assessing changes in function, skills, and abilities should be developed for individuals with disabilities (Dowler, D. L., Hirsch, A. E., Kittle, R. D., and Hendricks, D. J. (1996)) and technology resources should be systematically considered at all stages of an individual's employment and overall rehabilitation process (Langton, A.J., and Ramseur, H. (2001)). Accordingly, NIDRR seeks to fund an RERC that facilitates equitable access to, and use of, workplace equipment and facilities and otherwise promotes safety, independence, and active engagement in the workplace by individuals with disabilities.

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Priority 10—RERC for Rehabilitation Robotics and Telemanipulation Systems

Rehabilitation of physical impairment is labor intensive, often relying on one-on-one interactions and hands-on manipulations by physicians and therapists. Technologies are now available to help replicate these therapeutic manipulations so that individuals can practice therapy on their own in a clinic or possibly at home. Several studies suggest that appropriately designed robotic rehabilitation therapy may be used for the assessment and treatment of motor impairments (Lum, Bugar, Shor, Majmundar, & Van der Loos, 2002;

Reinkensmeyer, Hogan, Krebs, Lehman, & Lum, 2000; Riener, Lunenburger, Jezernik, Anderschitz, Colombo, & Dietz, 2005).

By replicating therapy techniques that normally require one-on-one contact with clinicians, robotic manipulators could increase access to therapy, increase time spent in therapy, potentially reduce the cost of therapy, and possibly achieve better outcomes than traditional rehabilitation therapies. Accordingly, NIDRR seeks to fund an RERC that evaluates the efficacy of rehabilitation robotic therapies and researches and develops innovative technologies and techniques to improve the current state of the science and usability of rehabilitation robotic therapies for individuals with disabilities.

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Priority 11—RERC for Emergency Management Technologies

Although disasters and emergencies may have a greater impact on individuals with disabilities, their needs and concerns in the areas of emergency preparedness, response, and recovery are often overlooked (National Council on Disability, 2005). Many individuals with disabilities rely on elevators, accessible transportation, and accessible communications, all of which can be compromised during disasters or emergency situations (Executive Order 13347, Annual Report, 2005). The aim of Executive Order 13347 is to ensure that the Federal Government appropriately supports safety and security for individuals with disabilities. Accordingly, NIDRR seeks

to fund an RERC that researches, develops, and evaluates emergency management technologies and implementation plans to support the full inclusion of people with disabilities.

References

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Proposed Priorities

The Assistant Secretary for Special Education and Rehabilitative Services proposes seven priorities for the establishment of (a) An RERC for Spinal Cord Injury (Priority 5), (b) an RERC for Recreational Technologies and Exercise Physiology Benefiting Individuals with Disabilities (Priority 6), (c) an RERC for Translating Physiological Data into Predictions for Functional Performance (Priority 7), (d) an RERC for Accessible Medical Instrumentation (Priority 8), (e) an RERC for Workplace Accommodations (Priority 9), (f) an RERC for Rehabilitation Robotics and Telem Manipulation Systems (Priority 10), and (g) an RERC for Emergency Management Technologies (Priority 11). Within its designated priority research area, each RERC will focus on innovative technological solutions, new knowledge, and concepts that will improve the lives of persons with disabilities.

(a) *RERC for Spinal Cord Injury (Priority 5)*. Under this priority, the RERC must research, develop and evaluate innovative technologies and approaches that will improve the treatment, rehabilitation, employment, and reintegration into society of persons with spinal cord injury. This RERC must work collaboratively with the NIDRR-funded Spinal Cord Injury Model Systems Centers program;

(b) *RERC for Recreational Technologies and Exercise Physiology Benefiting Individuals With Disabilities (Priority 6)*. Under this priority, the RERC must research, develop, and evaluate innovative technologies and strategies that will enhance recreational opportunities for individuals with disabilities and develop methods to enhance the physical performance of individuals with disabilities;

(c) *RERC for Translating Physiological Data into Predictions for Functional Performance (Priority 7)*. Under this

priority, the RERC must determine the physiological measurement tools that are available in a specific sub-specialty of rehabilitation. A sub-specialty may be based on underlying disabling condition (e.g., spinal cord injury, and Parkinson's disease), or on specific sequelae that may be common to a wide variety of disabling conditions (e.g., pain, spasticity). The RERC must then develop and evaluate models and methods for determining the relationships between basic physiological measurements and functional performance. These models and methods must take the characteristics of individuals and their environments into consideration when attempting to delineate these relationships, so that the results of this research are relevant to clinical practice and the real-world experiences of individuals with disabilities.

(d) *RERC for Accessible Medical Instrumentation (Priority 8)*. Under this priority, the RERC must research, develop, and evaluate innovative methods and technologies to increase the usability and accessibility of diagnostic, therapeutic, and procedural healthcare equipment (e.g., equipment used during medical examinations, and treatment) for individuals with disabilities. This includes developing methods and technologies that are useable and accessible for patients and health care providers with disabilities.

(e) *RERC for Workplace Accommodations (Priority 9)*. Under this priority, the RERC must research, develop, and evaluate innovative technologies and implementation plans, devices, and systems to enhance the productivity of individuals with disabilities in the workplace. This RERC must emphasize the application of universal design concepts to improve the accessibility of the workplace and workplace tools for all workers.

(f) *RERC for Rehabilitation Robotics and Telem Manipulation Systems (Priority 10)*. Under this priority, the RERC must research, develop, and evaluate human-scale robots and telem Manipulation systems that will provide or perform rehabilitation therapies and address the unique needs of individuals with disabilities.

(g) *RERC for Emergency Management Technologies (Priority 11)*. Under this priority, the RERC must research, develop, and evaluate existing and innovative emergency management technologies to enhance emergency outcomes for individuals with disabilities. Areas of focus within this priority research area may include but are not limited to communications, transportation, evacuation, and other

areas related to emergency preparedness, response, and recovery. In addition, this RERC must provide input and expertise into the development of standards to improve emergency management for individuals with disabilities. This RERC must work collaboratively with the NIDRR-funded Disability and Rehabilitation Research Project: Inclusive Emergency Evacuation of People with Disabilities.

Under each priority, the RERC must be designed to contribute to the following programmatic outcomes:

(1) Increased technical and scientific knowledge-base relevant to its designated priority research area. The RERC must contribute to this outcome by conducting high-quality, rigorous research and development projects.

(2) Innovative technologies, products, environments, performance guidelines, and monitoring and assessment tools as applicable to its designated priority research area. The RERC must contribute to this outcome by developing and testing these innovations.

(3) Improved research capacity in its designated priority research area. The RERC must contribute to this outcome by collaborating with the relevant industry, professional associations, and institutions of higher education.

(4) Improved focus on cutting edge developments in technologies within its designated priority research area. The RERC must contribute to this outcome by identifying and communicating with NIDRR and the field regarding trends and evolving product concepts related to its designated priority research area.

(5) Increased impact of research in the designated priority research area. The RERC must contribute to this outcome by providing technical assistance to public and private organizations, individuals with disabilities, and employers on policies, guidelines, and standards related to its designated priority research area.

In addition, under each priority, the RERC must—

- Have the capability to design, build, and test prototype devices and assist in the transfer of successful solutions to relevant production and service delivery settings;
- Evaluate the efficacy and safety of its new products, instrumentation, or assistive devices;
- Provide as part of its proposal and then implement a plan that describes how it will include, as appropriate, individuals with disabilities or their representatives in all phases of its activities, including research, development, training, dissemination, and evaluation;

- Provide as part of its proposal and then implement, in consultation with the NIDRR-funded National Center for the Dissemination of Disability Research (NCDDR), a plan to disseminate its research results to individuals with disabilities, their representatives, disability organizations, service providers, professional journals, manufacturers, and other interested parties;

- Develop and implement in the first year of the project period, in consultation with the NIDRR-funded RERC on Technology Transfer, a plan for ensuring that all new and improved technologies developed by the RERC are successfully transferred to the marketplace;

- Conduct a state-of-the-science conference on its designated priority research area in the fourth year of the project period and publish a comprehensive report on the final outcomes of the conference in the fifth year of the project period; and

- Coordinate research projects of mutual interest with relevant NIDRR-funded projects, as identified through consultation with the NIDRR project officer.

Executive Order 12866

This notice of proposed priorities has been reviewed in accordance with Executive Order 12866. Under the terms of the order, we have assessed the potential costs and benefits of this regulatory action.

The potential costs associated with this notice of proposed priorities are

those resulting from statutory requirements and those we have determined as necessary for administering this program effectively and efficiently.

In assessing the potential costs and benefits—both quantitative and qualitative—of this notice of proposed priorities, we have determined that the benefits of the proposed priorities justify the costs.

Summary of Potential Costs and Benefits

The benefits of the Disability and Rehabilitation Research Projects and Centers Programs have been well established over the years in that similar projects have been completed successfully. These proposed priorities will generate new knowledge and technologies through research, development, dissemination, utilization, and technical assistance projects.

Another benefit of these proposed priorities is that the establishment of new DRRPs and new RERCs will support the President's NFI and will improve the lives of persons with disabilities. The new DRRPs and RERCs will generate, disseminate, and promote the use of new information that will improve the options for individuals with disabilities to perform regular activities in the community.

Intergovernmental Review

This program is not subject to Executive Order 12372 and the regulations in 34 part 79.

Applicable Program Regulations: 34 CFR part 350.

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(Catalog of Federal Domestic Assistance Numbers 84.133A Disability Rehabilitation Research Projects and 84.133E Rehabilitation Engineering Research Centers Program)

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Dated: September 13, 2006.

John H. Hager,

Assistant Secretary for Special Education and Rehabilitative Services.

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