



# The National Institute on Disability, Independent Living, and Rehabilitation Research



FY 2021-2022 Organization Highlights

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## MISSION

**The Administration for Community Living’s (ACL) National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)** was established by Congress to conduct research that leads to improved health and function, employment, and community living outcomes of individuals with disabilities. NIDILRR’s mission is to generate new knowledge and promote its effective use to maximize the full inclusion and integration into society, employment, independent living, family support, and economic and social self-sufficiency of individuals with disabilities of all ages. NIDILRR achieves this mission by

- supporting research, development, capacity-building, knowledge translation, and related activities to maximize the full inclusion and integration of individuals with disabilities of all ages into society, employment, independent living, family support, and into economic and social self-sufficiency;
- promoting the transfer of, use, and adoption of rehabilitation technology for individuals with disabilities in a timely manner; and
- ensuring the widespread distribution, in usable formats, of practical scientific and technological information to advance policy, practice, and services to improve outcomes for people with disabilities.

NIDILRR organizes its activities around three major outcome domains—community living and participation, health and function, and employment—and addresses a wide range of disabilities and impairments across populations of all ages.

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## HOW IS NIDILRR FUNDING USED?

NIDILRR addresses a broad scope of research, capacity-building, and knowledge translation activities related to disability, rehabilitation, and independent living. These projects reflect the breadth of disability research within the agency’s outcome domains of community living and participation, health and function, and employment.

NIDILRR research is designed to generate new knowledge and technologies and stimulate change in programs, practices, and public policies to the benefit of Americans with disabilities and their families. NIDILRR's grant programs vary in purpose, scope, duration, size, and outcome area.

NIDILRR sponsors disability and rehabilitation research and development in the outcome domains of community living and participation, health and function, and employment. Through its grant programs, NIDILRR also invests in the following areas to promote positive community living and participation, employment, and health and function outcomes among people with disabilities:

- Technology for Access and Function
- Disability Demographics
- Knowledge Translation
- Capacity-Building for Rehabilitation Research and Training

### ***NIDILRR Outcome Areas***

- *Community Living and Participation*
- *Employment*
- *Health and Function*

## **HOW IS NIDILRR RESEARCH MAKING A DIFFERENCE?**

Selected projects from fiscal years (FYs) 2021 and 2022 are highlighted throughout this report to illustrate the variety of NIDILRR activities and achievements that are improving the lives of people with disabilities.

### **Products of NIDILRR Grants**

The summaries that follow, organized by funding mechanism, highlight examples of grantee activities and achievements. Grantees employ an assortment of methodologies to conduct research and develop new products and technologies, including randomized controlled trials, longitudinal studies, qualitative studies,

and intervention studies. NIDILRR grantees produce an assortment of output types, from the more traditional category of peer-reviewed publications to such outputs as technological devices, prototypes, special software, and new physiologic measurement tools, as well as audiovisual materials and intervention curricula.



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## NIDILRR RESOURCES ON DISABILITY POLICY AND RESEARCH

NIDILRR supports the Americans with Disabilities Act (ADA) National Network and the National Rehabilitation Information Center (NARIC), which help the public find and use current information about disability policy and research.



### ADA National Network

NIDILRR sponsors and oversees the ADA National Network, which conducts research and provides technical assistance, training, and information resources related to the ADA. The ADA is a comprehensive civil rights law designed to guarantee people with disabilities have equal opportunity in employment, public accommodations, state and local government services, transportation, and telecommunications. The ADA Network (<http://adata.org>) includes 10 regional centers and the ADA Knowledge Translation Center. Together, they serve local, regional, and national stakeholders to foster ADA implementation. The 10 regional centers conducted 1,113 training activities during 2021 and 1,342 during 2022, including customized training presentations, training courses, and conferences. The network responded to more than 16,000 inquiries in FY 2021 and more than 15,000 inquiries in FY 2022 by phone, email, ADA center website, or in person. Worth noting, the ADA centers added a tag to their database to capture and categorize COVID-related and long COVID-related data calls. From January 1, 2020, to December 14, 2022, there were 3,898 COVID-related calls received by the ADA National Network centers, and of those, 88 (2.26%) were related to long COVID. The most frequent aspect of ADA asked about in relation to long COVID was Title I (Employment)—more specifically, reasonable accommodations (53% of interactions), and enforcement (20% of interactions).

The ADA Participation Action Research Consortium complements the Network’s activities through

research on factors influencing the community living of citizens with disabilities, as well as through assessments of promising practices at state, regional, and community levels.

The following is an example of an ADA National Network activity and achievement during this reporting period:

#### ***Telemedicine Barriers for Persons With Disabilities (2022) – Grant #90DP0092***

The Southwest ADA Center addressed telemedicine barriers for persons with disabilities in a publication entitled **“Telemedicine Barriers and Challenges for Persons with Disabilities: COVID-19 and Beyond.”** The Southwest ADA National Network Regional Center provides training and technical assistance to benefit individuals and entities with rights and responsibilities under the ADA. In addition, this center conducts research into access barriers experienced by people with disabilities. This article describes key systematic challenges that need to be addressed to ensure that telemedicine is available and fully accessible to individuals with disabilities. During this reporting period, the publication has been cited by several researchers conducting studies in accessible telehealth, and it has implications for improving the health outcomes for persons with disabilities in a new era of healthcare delivery.





## National Rehabilitation Information Center

NARIC ([www.naric.com](http://www.naric.com)) is an information resource center funded by NIDILRR to disseminate information about disability, independent living, and rehabilitation research to the public. NARIC services are available through its website, social media, and other outreach avenues. During FY 2021, NARIC received more than 210,000 visitors to its website, and another 105,704 visited during FY 2022. NARIC had more than 10,000

social media followers across multiple platforms in English and Spanish and connected with users via presentations and exhibits at virtual and in-person conferences that had more than 7,000 attendees. NARIC's collection grew by more than 6,000 publications and products between FY 2021 and FY 2022, including more than 1,100 journal articles, books, reports, and multimedia materials produced by NIDILRR grantees.

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## FIELD-INITIATED PROJECTS

Field-Initiated Projects (FIPs) are investigator-initiated research or development projects drawn from a pool of applicants proposing a wide variety of target populations and research and development aims. These projects generate new knowledge through research or development on a smaller scale relative to Disability and Rehabilitation Research Projects (DRRP) and center grants. All FIP grantees must carry out research or development projects to improve outcomes of people with disabilities in the health and function, employment, or community living and participation domains. FIP awards are typically 3 years in duration. Following are examples of FIP activities and achievements reported to NIDILRR.

### Employment Outcomes

#### ***Predictors of Worklife Burnout Among Mental Health Certified Peer Specialists (2022) – Grant #901FRE0029***

Certified peer specialists (CPSs) are a growing workforce who use their lived experience of behavioral health disorders, plus skills learned in formal training, to deliver support services. Despite their important role in the mental health care system and research on their working conditions, experiences of burnout have not been widely studied among CPSs. A FIP grantee published a recent study entitled “**Predictors of Worklife Burnout Among Mental Health Certified Peer Specialists.**” This study used survey data from CPSs who were currently employed in any type of job,

providing peer support services or not. The study used the Maslach Burnout Inventory and Areas of Work-life Survey, along with other measures of personal and job characteristics, to examine the relationships of predictor variables to burnout measures. Scores on each of the averaged burnout measures differed significantly between those employed in peer services jobs and those in other job types, with those in peer services jobs reporting lower exhaustion, lower cynicism, and higher professional efficacy. Better workload and fairness were associated with significantly lower exhaustion, and better reward and community were both associated with significantly lower cynicism. Those employed in peer services jobs had fewer signs of burnout than those in other occupations, a finding consistent with prior research. These results can be

used by policy makers to better support and develop this valuable workforce, thus improving their job satisfaction and retention, along with the recovery outcomes of the people they serve.

***Work Limitations as a Moderator of the Relationship Between Job Crafting and Work Performance (2022) – Grant #90IFRE0008***

Job crafting is an incremental, employee-initiated job design process used to achieve a better fit between job demands and worker skills. Persons with work limitations face multiple barriers to optimal work performance. Some persons with work limitations may naturally use job crafting as a strategy to achieve better alignment with their job tasks and demands; however, the extent to which job crafting may be helpful in improving work performance and engagement is unknown. In 2022, an NIDILRR grantee published the study, “[Work Limitations as a Moderator of the Relationship Between Job Crafting and Work Performance: Results From an SEM Analysis of](#)

[Cross-Sectional Survey Data.](#)” The purpose of this study was to examine the moderating role of work limitations in the relationship between job crafting and work performance and to understand the complex relationship between job crafting, work limitations, work engagement, work performance, readiness to change, and worker characteristics. The study used an online survey of workers with and without disabilities, age 18 and older, to assess the relationships among job crafting, work limitations, work engagement, work performance, readiness to change, and worker characteristics. Ultimately, the study found that work limitation weakens the relationship between job crafting and work performance. Worker characteristics such as education and years of work experience predict crafting behaviors, and work engagement mediates the relationship between job crafting and work performance. Results of this study demonstrate that job crafting interventions may prove beneficial at increasing work engagement and performance for workers with limitations.

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## SMALL BUSINESS INNOVATION RESEARCH

The intent of NIDILRR’s Small Business Innovation Research (SBIR) program is to help support the development of new ideas and products that are useful to persons with disabilities by inviting the participation of small business firms with strong research capabilities in science, engineering, or educational technology. Small businesses must meet eligibility criteria to participate: the company must be American-owned and independently operated, it must be for-profit and employ no more than 500 employees, and the principal researcher must be employed by the business. During Phase I, NIDILRR-funded firms conduct feasibility studies to evaluate the scientific and technical merit of an idea. During Phase II, NIDILRR-funded firms expand on the results of Phase I to pursue further development and commercialization. Following are examples of SBIR activities and achievements reported to NIDILRR.

### Health and Function

***Evalu8NOW Tool to Monitor Anxiety and Depression in Individuals With Parkinson’s and Other Neurological Diseases Using Avatar Technology (2022) – Grant #90BISB0014***

This funding year, the Evalu8NOW tool, developed by CreateAbility Concepts, Inc., was introduced to respectfully monitor depression and anxiety of people with Parkinson’s and other degenerative neurological diseases, anywhere, anytime, using avatar technology. This tool allows providers to collect critical data and

*Small businesses must meet eligibility criteria to participate: the company must be American-owned and independently operated, it must be for-profit and employ no more than 500 employees, and the principal researcher must be employed by the business.*



monitor clients' physical and mental well-being using a combination of web-based assessments and interventions. Its aim is to increase data integrity and ensure clients have direct access to intervention for self-care outside of regular assessments. People with Parkinson's disease and other similar degenerative neurological diseases may be able to maintain their levels of function with proper ongoing exercise programs geared towards their individualized deficit profile. There is significant evidence that supports the importance of depression and anxiety monitoring within the population of people with Parkinson's disease. Without accounting for the effect of depression, researchers may miss significant reasons why individuals with Parkinson's disease do not participate in activities that have been shown to help them, such as exercise.

## Technology for Access and Function

### *T3 Tactile Tablet (2022) – Grant #90BISB0012*

Touch Graphic, Inc., created the T3 Platform, a system for creating, distributing, and consuming touch-responsive, audio-embedded tactile graphic maps, games, puzzles, and interactive lessons. In 2022, this grantee announced the release of their T3 Tactile Tablet. With the T3 platform, users drop a tactile overlay sheet onto a large Android tablet computer fitted with a plastic T3 frame, then explore tactile figures and braille with both hands and all 10 fingers, tapping and swiping to trigger spoken descriptions and explanations of anything they want to know about. The T3 platform solves the problem of overlay sheet identification in a tactile tablet: as each new sheet is placed on the tablet, a barcode printed near the top will be scanned by the computer's front-facing camera, bounced off a tilted mirror positioned one inch above the camera, on the underside of a plastic hood. An app running on the tablet queries a cloud server for data on the currently mounted sheet in an automatic transparent process. This innovation eliminates the requirement that the user find and press five different locations each time a new overlay is put in place. The result is a smoother, faster sheet change sequence, and no more sheet. T3 will also add the option to use voice commands instead of finding and pressing tactile buttons to control the system. This option may enhance efficiency and user satisfaction since users will be able to maintain contact with both hands on the braille or tactile graphic on which they are focused. Over the next 10 years, Touch Graphics, Inc. anticipates selling 10,000 T3 tactile tablets and a larger number of T3 binders full of tactile overlays. If a critical mass of content and users can be reached, T3 could approach worldwide popularity among tactile readers around the world.





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## MODEL SYSTEMS

NIDILRR's Model Systems programs in spinal cord injury (SCI), traumatic brain injury (TBI), and burn injury provide coordinated systems of rehabilitation care and conduct research on recovery and long-term outcomes. These centers serve as platforms for collaborative, multisite research, including research on interventions using randomized controlled trials.

Founded in 1973, the National SCI Database has collected injury follow-up data through a total of 31 funded centers. Eighteen funded centers, plus an additional one previously funded center, actively collected SCI follow-up data in FY 2022. Their actions contributed to the collection of SCI data from 50,836 individuals as of the end of FY 2021 and 51,227 individuals as of the end of FY 2022. A new NIDILRR initiative brought forth in June 2022 was a challenge to the SCI Model Systems (SCIMS) to carefully, thoughtfully and with intentionality consider expansion of both the research projects and the longitudinal database to expand to include individuals with nontraumatic SCI (ntSCI). During FY22, the SCIMS data center worked to systematically identify the etiologic, neurological, and rehabilitation system-level variables associated with ntSCI with input from experts. Then, a landscape analysis was completed across 18 SCIMS to assess how many and what types of ntSCI patients were being seen and to gain information about potential data collection modifications. Currently, pilot data are being collected across all 18 SCIMS to inform the design of future ntSCI national database.

Sixteen funded centers plus three longitudinal follow-up sites contributed data to the TBI Model System (TBIMS) National Database in 2021 and 2022. Their efforts have collected information on 18,994 individuals admitted for inpatient acute TBI rehabilitation as of FY 2021 and 19,353 individuals as of FY 2022. Worth noting, in addition to the 16 NIDILRR-funded TBIMS sites, there are five U.S. Department of Veterans Affairs Polytrauma Rehabilitation Research Centers that work closely with NIDILRR's network, allowing for the sharing of data, resources, and expertise to track outcomes of civilian and military individuals with TBI. This collaborative approach has enabled both descriptive and comparative studies to be conducted. The

Burn Model Systems (BMS) collected data on burn injury treatment from four centers in FY 2021 and 2022. As of December 2021, the BMS centers had enrolled 6,829 participants into the BMS database and had follow-up data available for 4,901 participants, some going back more than 25 years.

Studies using these databases have provided researchers opportunities to explore the social and environmental factors influencing the community living and participation of individuals affected by these injuries, best clinical practices for screening and treatment, physiological aspects of the conditions, and long-term outcomes. Following are examples of Model Systems activities and achievements reported to NIDILRR.

### Community Living and Participation

#### *Impact of State Long-Term Services and Supports on Levels of Community Participation and Life Satisfaction for People With TBI (2021) – Grant #90DPTB0001*

While a substantial literature has examined the effects of individual- and family-level factors on outcomes following TBI, minimal attention has been directed to the potential influence of the larger environmental context on outcomes. The [Ohio Regional TBI Model System Center at Ohio State University](#) conducted a study—“[Do State Supports for Persons With Brain Injury Affect Outcomes in the 5 Years Following Acute Rehabilitation?](#)”—that investigates the effects of state-level resources and supports as an environmental factor influencing long-term outcomes from TBI, using data from the TBIMS National Database funded by NIDILRR. The researchers examined the effects of state-level supports and resources on persons in their

first 5 years after rehabilitation for moderate and severe TBI. The primary hypothesis was that community participation, global functioning, and life satisfaction will be higher on average among people with TBI living in states with more brain-injury-specific programs and resources and better long-term services and support (LTSS). The researchers found that state supports have a small but significant impact on community participation and life satisfaction. The most consistent finding indicated that states with better LTSS had higher levels of community participation and life satisfaction on average for people with TBI over and above individual-level differences and fluctuations in these outcomes over time. There was also indication that more brain-injury-specific supports, as reflected in per capita brain injury trust fund revenues, result in better participation in the community, an effect which was more pronounced as a person was further post-injury. In states that had been long-term recipients of federal Health Resources and Services Administration and ACL TBI State Partnership funding, persons with more severe cognitive impairment did better over time than people in states that had not received this funding.

## Health and Function

### *Setting the National Target for Recovery of People With TBI (2022) – Grant #90DPTBoo18*

**Healthy People 2030**, the nation's current 10-year plan for addressing the most critical public health priorities, has accepted an objective for the recovery of individuals with TBI that was proposed by a small work group led by NIDILRR's **TBIMS National Data and Statistical Center**. This objective is to "increase the percentage of adults who can resume more than half of their preinjury activities (with or without supports) 5 years after receiving acute inpatient rehabilitation for traumatic brain injury." The objective points to the critical importance of access to inpatient rehabilitation and to community-based services and supports for people with chronic brain injury. The **TBIMS National Database** is the approved data source for monitoring progress toward this objective over the coming decade. This database is the product of NIDILRR's **TBIMS centers** and, is managed by the TBIMS National Data and Statistical Center.

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## DISABILITY AND REHABILITATION RESEARCH PROJECTS

The DRRP funding program supports projects that carry out one or more of the following activities: research, development, training, dissemination, utilization, and technical assistance. The purpose of the DRRP program is to plan and conduct research, training, and related activities to develop methods, procedures, and rehabilitation technology that maximize the full inclusion and integration of individuals with disabilities into society, employment, and independent living and to promote economic and social self-sufficiency and improve the effectiveness of services authorized under the Rehabilitation Act. Following are examples of DRRP activities and achievements reported to NIDILRR.

### Community Living and Participation

#### *Factors That Influence Community Participation for Adults Aging With Long-Term Physical Disability (2022) – Grant #90DPCP0001*

People aging with long-term physical disability are living longer and experiencing the challenges of aging,

including the onset of secondary and age-related chronic health conditions, leaving them at high risk of diminished functional abilities and compromised participation. In 2022, an NIDILRR grantee at Washington University in St. Louis published the journal article, "**Factors Influencing Participation Among Adults Aging With Long-Term Physical Disability.**" There are currently limited evidence-based interventions that address

issues regarding participation for people aging with long-term physical disability. This study examined factors influencing participation in personal and life activities among people aging with long-term physical disability to inform future interventions. The study identified eight different categories of factors that influence participation: physical environment factors, social factors, symptoms, economic factors, policy factors, body structure and functions, mental and emotional state, and temporal factors. Ultimately, the study found that people aging with long-term physical disability experience a wide range of factors that impact their ability to participate in their community and maintain independence. By identifying what barriers people aging with long-term disabilities face, new interventions can be designed to address these barriers and promote increased participation in society.

## Health and Function

### *Service Delivery Processes for People With Disabilities Who Use Complex Rehabilitation Technology (2022) – Grant #90DPGE0014*

Current health policy for custom manual and power wheelchairs (complex rehabilitation technology, or CRT) for people with disabilities is very restrictive to the point that they are not even covered for people

to leave their homes to attend work or school. That conflicts with the spirit of the Rehabilitation Act. Modern healthcare is moving toward accountable and value-based care that uses a combination of research, large data, and best practices to determine what services will be paid for. This presents an opportunity for CRT and people who use these devices to seek a more equitable coverage policy. CRT supports independence for individuals with disabilities by enabling mobility for function, employment, education, and independent living. CRT service delivery is evolving, with changes to funding, provider qualifications, consumer needs, and technological advances. In 2022, an NIDILRR grantee at University of Pittsburgh published [“Service Delivery for Complex Rehabilitation Technology: A Scoping Review,”](#) which investigates service delivery processes for individuals with disabilities who have a mobility impairment, while specifically identifying best practices, barriers, and unique features of health delivery policies and practices. This scoping review found that CRT consumers experience long wait times, lack of specialized clinical experience, and limited consumer education opportunities. To address this problem, more consistent and widespread research is needed on CRT to grow evidence-based practices. This review provides a foundation for developing novel policy on CRT services and devices to replace existing more restrictive policies.

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## REHABILITATION ENGINEERING RESEARCH CENTERS

The purpose of the Rehabilitation Engineering Research Centers (RERCs) program is to improve the effectiveness of services authorized under the Rehabilitation Act by conducting advanced engineering research and development of innovative technologies designed to solve particular rehabilitation problems or remove environmental barriers. RERCs also demonstrate and evaluate such technologies, facilitate service delivery systems changes, stimulate the production and distribution of equipment in the private sector, and provide training opportunities to enable individuals, including individuals with disabilities, to become researchers and providers of rehabilitation technology. Awards are normally made for a 5-year period. Following are examples of RERC activities and achievements reported to NIDILRR.

## Technology for Access and Function

### *Innovative Solutions for Universal Design (isUD™) – Motion Junction Playground Receives UD Certification (2022) – Grant #90RE5022*

In August 2022, a new, fully inclusive playground called **Motion Junction** formally opened in Canandaigua, NY, and recently it received the Reshaping Rochester Award for Best Design. This playground was the result of collaboration between a nonprofit organization, Inclusion in Motion, and the NIDILRR-grantee Center for Inclusive Design and Environmental Access (IDEA Center) at the State University of New York at Buffalo. With this partnership, the ultimate goal was to extend the limits of design and provide an enhanced experience for all playground visitors by incorporating universal design (UD) strategies into every aspect of the project. “The playground empowers all abilities and ages to play, exercise, learn, and socialize together while enriching our community,” says Sonya Smith, cofounder of Inclusion in Motion. Playgrounds provide many benefits for children to learn and play freely. This unstructured play is considered essential to the physical, cognitive, social, and emotional well-being of children. Unfortunately, many traditional playgrounds do not accommodate children with differing abilities and others that are ADA compliant provide only minimal access. A playground that is truly inclusive is not just accessible, but an environment that facilitates parallel play, where children of all abilities are able to play side by side and interact with each other. The socialization that is fostered from a play environment carries over into the



community between all abilities and all ages. [A news article in June 2022](#) and [a news article in October 2022](#) both describe the important impact this inclusive playground has had on the lives of children with disabilities. More information is available on the [isUD website](#).

### *Interactive Touch Model Widely Adopted (2022) – Grant #90RE5022*

In the current funding cycle of the RERC on Universal Design and the Built Environment at the University at Buffalo, State University of New York, the grantee’s **Touch-Responsive Models** (three-dimensional [3D] representations of buildings and plans) have been externally adopted. While the touch models were initially installed in various schools for the blind, they are now being commercialized and installed in locations that attract a more diverse population. Recent external adoption of the touch model included installation at the Buffalo Niagara Medical Campus, Guide Dogs for the Blind, and University of California, Davis. Also, wall-mounted touch maps have been installed at the Google Hanger in Playa Vista, CA. Tactile graphics and models are a common way of presenting spatial information to people who do not see well enough to use print graphics. Buildings often provide two-dimensional diagrams like “you are here” maps to orient individuals and help them understand building layouts, but rarely are these maps augmented with tactile models for people with visual impairments. Multisensory models have benefits for





all building users because they expand the amount of information available for all. These models incorporate innovative digital fabrication techniques, materials, and software to enhance utilization of buildings and sites by people with disabilities, using universal design principles that also benefit other users. Future commercial opportunities for the touch model include campuses, museums, hospitals, and other public spaces where pedestrians need orientation and way-finding information in an accessible format.

***Morphic, a Free Open-Source Software Application That Makes Computers Easier to Use, Is Focused on Social Equity Through Digital Inclusion (2022) – Grant #90REG0008***

The Inclusive Information and Communications Technology (ICT) RERC at University of Maryland, College Park, released a new version of [Morphic](#), and it has already been installed on over 7,000 computers in universities, libraries, and disability programs across

the country. Morphic is a free, open-source program for Windows and macOS that makes computers easier to use and makes the built-in accessibility features easier to find and use. Access to and use of computers has become essential for almost all aspects of life, yet some people cannot use computers because they are too complicated or they need adjustments to make the font larger or, if they have a reading disability, to have the text read to them. Modern operating systems have these features built into them, but they are hidden in control panels and other places where people do not know about them. For people with disabilities and many who are older, being able to easily access and use these features can be the difference between being able to use computers they need or not. In 2022, the Inclusive ICT RERC published a paper from the 2022 International Conference on Human-Computer Interaction, [“Assistive Technology on Demand \(AToD\) + Morphic 2.0 – Changing What Is Possible With Assistive Technologies and Who Can Benefit.”](#)

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## REHABILITATION RESEARCH AND TRAINING CENTERS

Rehabilitation Research and Training Centers (RRTCs) conduct coordinated, integrated, and advanced programs of research, training, and information dissemination in topical areas that are specified by NIDILRR. Areas of focus include the improvement of rehabilitation methodology and service delivery systems; the improvement of health and functioning; and the promotion of employment, independent living, family support, and economic and social self-sufficiency for individuals with disabilities. RRTCs provide training, including graduate, preservice, and in-service training, to build capacity for disability and rehabilitation research. They also serve as centers of national excellence in rehabilitation research. Awards are normally made for a 5-year period. Following are examples of RRTC activities and achievements reported to NIDILRR.

### Community Living and Participation

***Progress Over the Past 30 Years to Promote Community Living and Participation for People With Intellectual and/or Developmental Disabilities (2021) – Grant #90RTC0003***

In 2021, the RRTC on Community Living for Persons

With Intellectual and Developmental Disabilities at the University of Minnesota, in collaboration with two other ACL grantees, published [30 Years of Community Living for Individuals With Intellectual and/or Developmental Disabilities \(1987–2017\)](#). This free digital book provides data from longitudinal projects of national significance to illustrate the deinstitution-





alization movement in the United States using data about residential services, employment, and funding to illustrate the progress made over the past 30 years to promote community living. The book includes infographics, photos, accessible language, and a variety

of personal perspectives on community living and inclusion from people with intellectual and/or developmental disabilities who participated as advisors on this project. More information about this book, including a link to a captioned video presentation about the book, may be found on the [ACL website](#).

## Employment Outcomes

### ***Changing Employers' Implicit Attitudes About the Competence of People Who Are Blind (2022) – Grant #90RTEM0007***

Long-held societal beliefs regarding people who are blind are thought to contribute to their low employment rates. In 2022, the RRTC on Employment of People Who Are Blind or Have Low Vision conducted an experimental study, “[Changing Employers' Implicit Attitudes About the Competence of People Who are Blind,](#)” which examined the impact of a meeting between a vocational rehabilitation (VR) professional and a hiring manager on these beliefs, or implicit attitudes, about the competence of people who are blind. Participants were 57 hiring managers working for a financial services company in the South who participated in a 1-hour meeting with a VR professional. Two VR professionals, one sighted and one blind, conducted the meetings, utilizing one of two approaches. Results of the study showed that implicit attitude scores decreased significantly following the meeting, though the size of the change was small. Type of approach and the interaction between approach and the VR professional’s vision status were not significantly associated with implicit attitude change. However, follow-up analyses indicated that participants who met with the blind VR professional had a significant decrease in negative, implicit attitude scores. The authors concluded that hiring managers’ implicit attitudes significantly improved following a meeting with a VR

professional, providing evidence that a brief interaction can decrease employers’ implicit bias regarding the competence of blind people. Additionally, hiring managers who met with the blind VR professional showed significant improvement in their implicit attitudes after the meeting, with a medium-to-large effect.

## Health and Function

### ***Food Sufficiency and the Utilization of Free Food Resources for Working-Age Americans With Disabilities During the COVID-19 Pandemic (2022) – Grant #90RTGE0001***

In 2022, the RRTC on Disability Statistics and Demographics (StatsRRTC) published a paper, “[Food Sufficiency and the Utilization of Free Food Resources for Working-Age Americans With Disabilities During the COVID-19 Pandemic.](#)” The objective of this study was to compare rates of food sufficiency and utilization of free food sources between working-age persons with and without disabilities in the United States during the COVID-19 pandemic. An online survey was conducted in 2020 that included 13,270 working-age individuals, with and without disabilities, to gather information about food sufficiency prior to COVID-19 (i.e., in March 2020) and within the previous 7 days, as well as receipt of free groceries or meals, use of food programs or pantries, and concerns with using free food sources over the past week. Controlling for sociodemographic characteristics, the authors found that the proportion of working-age persons who were food sufficient decreased from March 2020 to September 2020 for persons with disabilities (59% to 53%, a six-percentage-point decrease) and for persons without disabilities (77% to 73%, a four-percentage-point decrease). The rates of change were not significantly different between groups. In September 2020, higher proportions of persons with disabilities (57%) used free food resources in the past week than persons without disabilities (41%). The authors concluded that the low rate of food sufficiency, the high rate of free food resource utilization, and the concerns noted by working-age persons with disabilities in using these sources suggest a need for continuing nutrition assistance policy and program development targeting the needs of persons with disabilities.

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## KNOWLEDGE TRANSLATION

Knowledge translation (KT) is an active process of ensuring that new knowledge and products from research and development are used to improve the lives of individuals with disabilities. NIDILRR KT centers support NIDILRR grantees in producing and promoting the use of new knowledge and products among disability stakeholders in a variety of important disability issue areas. NIDILRR requires its grantees to involve stakeholders in the research and development process, translate findings into usable formats, and disseminate information to the community or identify plans to transfer products into the market.

***Model System Knowledge Translation Center: Award-Winning, Trusted Source of Consumer Information in Burn Injury, Spinal Cord Injury, and Traumatic Brain Injury (2022) – Grant #90DPKTo009***

The Model Systems Knowledge Translation Center (MSKTC) is a KT project funded, in part, to produce consumer materials that are based on the best available research findings. In collaboration with the SCI, TBI, and Burn Model Systems Centers, the MSKTC produced research-based consumer factsheets, educational videos, narrated slides, infocomics, and other informational materials on various topics directly relevant to the lives of people with these traumatic injuries. These resources are presented in language that all users can read and understand, in both English and Spanish, and hosted on the [MSKTC website](#) that has become the go-to source for consumers seeking trustable information over the years. During FY 2022, the MSKTC website received over 1,700,000 visitors, and the top 10 fact sheets alone were downloaded over 825,000 times. The MSKTC also received numerous awards over the years, recognizing the quality of the information materials they produced. Most recently, the MSKTC received a Silver Digital Health Award for their Respiratory Health and Spinal Cord Injury infocomic and a Bronze Digital Health Award for the Itchy Skin After Burn Injury infocomic.

***Timed Up and Go Test Infographic (2022) - Grant #90DPKTo007***

The Disability and Rehabilitation Research Project on Knowledge Translation to Promote Patient-Centered Care Through Use of Standardized Assessments at the Shirley Ryan Ability Lab aims to employ KT principles to develop materials for patients and care partners and enhance resources for clinicians regarding standardized assessments. Patients may have limited knowledge and understanding of how clinicians use standardized assessments to monitor progress, and not all clinicians and organizations routinely use them. This project leverages the Rehabilitation Measures Database (RMD), developed under previous NIDILRR funding, as a KT resource to provide clinicians with summaries of assessment instruments. Researchers work in partnership with graduate programs to involve faculty and students in developing enhanced resources for the target populations—patients and care partners, students, and rehabilitation clinicians—as well as adding new instruments to the RMD and producing new instrument summaries in peer-reviewed journals. The [Timed Up and Go Test infographic](#) provides easily understandable descriptions of the purpose of the test, the test procedures, and the meaning of the score. This infographic can be used for teaching, research, and practice.

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## RESEARCH CAPACITY-BUILDING SUPPORT

NIDILRR's goal is to increase capacity to conduct disability and rehabilitation research and development activities that make positive contributions to the lives of individuals with disabilities. To increase research capacity in the disability and rehabilitation field, NIDILRR supports three research training mechanisms: the Mary E. Switzer Fellowship Program, or Research Fellowship Program, Advanced Rehabilitation Research Training (ARRT) Projects, and Section 21.

### Mary E. Switzer Fellowship Program, or Research Fellowship Program

The Switzer Fellowship Program gives qualified individual researchers, including individuals with disabilities, the opportunity to develop new ideas and concentrate on specific lines of research experience. Fellows work for 1 year on an independent research project of their own design. Switzer Fellows are actively engaged in independent research and have gone on to hold prominent positions, primarily on the tenure track in academic research institutions, but also in hospital centers or in the private sector for research and biotechnology companies.

#### Featured Switzer Fellow

Dr. Anthony Plotner (Grant #90SFGEO025, ended 2021), a 2020–2021 Switzer Fellow, is now a professor in the Department of Special Education and Director of the Center for Transition Research and Leadership at the University of South Carolina at Columbia. His research focuses on community inclusion of individuals with significant disabilities. As a Switzer Fellow, Dr. Plotner investigated Centers for Independent Living and transition collaboration and expanded his role as a mentor for new researchers. Dr. Plotner was first author of four published papers and book chapters in 2022 and received a large new grant from the South Carolina Vocational Rehabilitation Department. More information about his work can be found at: <https://www.researchgate.net/profile/Anthony-Plotner>.

#### Quotes from Previous Switzer Fellows

*“The NIDILRR Switzer Fellowship was an incredible life and career changing experience. It was a significant part of obtaining tenure with my university, as it fostered new collaborations and future grant funding building on the research conducted, and it provided me with protected time to immerse myself in the research activities. I gained experience in managing all aspects of the fellowship grant and confidence to successfully apply for larger federal grants and leadership positions.”*

— Dr. Dara Chan

(Grant #90SFGEO008, ended 2021)

*“With the Switzer Fellowship, I was able to study a topic that has historically been avoided—the vocational experiences and needs of Black young adults with mental illnesses—resulting in a publication on how the effects of culture and experience of discrimination impact vocational service priorities of young Black people. This work led to partnerships with Black-led organizations and Black researchers in which I assist in sizing up and approaching grant opportunities and in using community-based participatory action research in disability studies.”*

— Dr. Jonathan Delman

(Grant #90SFGEO009, ended 2020)

## Advanced Rehabilitation Research Training Projects

The ARRT projects provide funding to institutions of higher education to recruit and provide advanced interdisciplinary research training to qualified postdoctoral fellows. In addition, research training is a requirement for RRTCs and RERCs. Other grants, such as the Model Systems, also support significant research training. The program supports a diverse cadre of young research professionals. An estimated 45% of fellows in the ARRT funding program in FY 2021 and 48% of fellows in the ARRT funding program in FY 2022 identify themselves as Latino, African American, American Indian, Asian, or Native Hawaiian. ARRT Fellows have been integral to several key research developments alongside mentors and senior researchers.

### ***NIDILRR ARRT Fellows Symposium – ACRM 99th Annual Conference – November 9, 2022***

The purpose of the ARRT program is to provide advanced research training and experience to individuals with doctorates, or similar advanced degrees, who have clinical or other relevant experience. In partnership with the American Congress of Rehabilitation Medicine (ACRM), NIDILRR selects five outstanding ARRT Fellows to present research relevant to the ACRM mission and audience during the ACRM annual conference. This year in Chicago, the following oral presentations were made by fellows:

#### **A Prediction of Fingertip Force and Joint Kinematics of Individual Fingers Using Motoneuron Firing Activities**

*Presenter:* Rinku Roy, PhD – Postdoctoral Research Fellow, North Carolina State University/University of North Carolina Joint Department of Biomedical Engineering.

#### **Acute Intermittent Hypoxia Increases Motor Unit Discharge Rates and Strength in Persons With SCI**

*Presenter:* Gregory Pearcey, PhD – Assistant Professor, School of Human Kinetics and Recreation and the Faculty of Medicine Division of Biomedical Sciences, Memorial University of Newfoundland. Formerly a Postdoctoral Research Fellow, Departments of Physical Medicine & Rehabilitation and Department of Neuroscience, Feinberg School of Medicine, Northwestern University

#### **Associations Between Functioning Recovery, Employment, and Neighborhood Disadvantage in People With Spinal Cord Injury**

*Presenter:* Han Su, PhD, RN – Assistant Professor, School of Nursing, Vanderbilt University. Formerly a Postdoctoral Research Fellow, Center for Education in Health Science, Feinberg School of Medicine, Northwestern University

#### **Contribution of Lower Limb Eccentric Control to Balance Recovery from Surface Drop Perturbations**

*Presenter:* Woohyoung Jeon, PhD – Assistant Professor, Department of Health and Kinesiology, The University of Texas at Tyler. Formerly a Postdoctoral Research Fellow, University of Maryland School of Medicine

#### **Experiences of Social Isolation Among People With Disabilities During the COVID-19 Pandemic**

*Presenter:* Jessica Kersey, PhD – Postdoctoral Research Fellow, Applied Health Sciences, University of Illinois Chicago.

**Bottom row (left to right):** Dr. Anjali Forber-Pratt, Director, NIDILRR; Dr. Han Su; Dr. Anne Ordway, Program Specialist, NIDILRR; Dr. Rinku Roy

**Top row (left to right):** Dr. Allen Heinemann, Professor, Physical Medicine and Rehabilitation, Emergency Medicine and Medical Social Sciences; Shirley Ryan AbilityLab and Feinberg School of Medicine, Northwestern University; Dr. Jessica Kersey; Dr. Woohyoung Jeon; Dr. Gregory Pearcey





## **Featured ARRT Fellows**

**Anneliese De Wet, PhD**  
Postdoctoral Research Fellow, Center for Psychiatric Rehabilitation, Boston University

Dr. De Wet completed her PhD in Psychology at Stellenbosch University in South Africa. For her dissertation she developed an individual measure of recovery for a South African context by exploring the understanding of recovery for persons, their caregivers, and their service providers as well as the barriers and facilitators of recovery. This was the first such measure developed for a South African context.



Dr. De Wet is particularly interested in issues related to peer support and in addressing mental health challenges, such as stigma, from a positive psychology perspective. She is currently conducting an innovative mixed methods study exploring the mechanisms of workplace stigma resistance among peer support specialists working with individuals with psychiatric disabilities. Interim findings reveal a wide range of stigma resistance mechanisms utilized by peer support specialists working in different mental health settings, including situational mechanisms as well as long-term personal growth trajectories reflecting positive changes in one's ability to withstand prejudice and discrimination at work. Her study is expected to contribute to enhancements of training programs for peer specialists to increase their stigma resistance capacity. It may also inform positive changes in mental health work environments to minimize a peer specialist's experiences of prejudice and discrimination. Dr. De Wet is also engaged in a randomized controlled trial testing the effectiveness of a coaching intervention to address peer specialist work-related stress.

**Mercedes Rodriguez Celin, MD**  
Postdoctoral Research Fellow,  
Marquette University

Dr. Rodriguez Celin is originally from Argentina, where she studied medicine at the University of Buenos Aires



and completed a 4-year residency in pediatric medicine. After finishing her training, she practiced pediatrics with a specialty in growth and development. She served as an attending physician at the Skeletal Dysplasia Clinic in the Garrahan Pediatric Referral Hospital in Buenos Aires for 6 years. Her focus at Garrahan was on clinical assistance and clinical research in osteogenesis imperfecta (OI) and other skeletal dysplasia. From 2017 to 2022, Dr. Rodriguez Celin worked as a clinician–researcher at Shriners Hospital for Children in Chicago. During that time, she completed an ARRT postdoctoral research fellowship through a multidisciplinary program offered through Marquette University, the Medical College of Wisconsin (MCW), and Shriners Hospitals for Children. Dr. Rodriguez Celin was involved in several multicenter studies to improve knowledge about the functional, surgical, and pain status of patients with OI. This year, Dr. Rodriguez Celin started a residency program in pediatrics at the University of Illinois at Chicago, and in 2023 she will start a residency program in medical genetics at MCW.



## Section 21 — Traditionally Underserved Populations

Section 21 focuses on research capacity-building for minority-serving institutions, such as historically Black colleges and universities and other institutions with significant racial/ethnic minority student populations. Section 21 of the Rehabilitation Act requires that 1% of NIDILRR appropriations be used to address traditionally underserved populations. The following is a recent activity and achievement of the Section 21 program:

### ***Research Capacity Building for Minority-Serving Institutions (2022) – Grant #90RTST0001***

The Langston University RRTC on Research and Capacity Building for Minority Entities engages minority-serving institutions (MSIs) in generating new knowledge leading to improved outcomes for persons with disabilities from traditionally underserved racial and

ethnic populations and enhancing research capacity and infrastructure. The RRTC works with various MSIs to strengthen their faculty scholars' and students' research skills and address research infrastructure challenges. This grantee is conducting research that leads to strategies for enhancing research capacity of investigators from MSIs. Their work involves a longitudinal study on the Institutional Research Capacity Building & Infrastructure Model (IRCBIM). North Carolina Agricultural and Technical State University is one of five MSIs participating in the study. Participants receive technical assistance to enhance faculty fellows' research skills and enhance the institutions' research infrastructure and culture. As a result of the capacity building received through the study, North Carolina Agricultural and Technical State University received a grant award under the Section 21 FIP-MSI competition. The IRCBIM intervention has promising implications for enhancing MSI participation in disability and rehabilitation research.

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## HIGHLIGHTS FROM FORMER NIDILRR GRANTEES

### Employment Outcomes

#### ***Diversity Partners Curriculum Adopted by Employment Services Agencies – Grant #90DP0065: 2014–2019***

The **Diversity Partners curriculum** developed under an NIDILRR grant at Cornell University aims to bridge the gap between employment service professionals, job seekers with disabilities, and business. The Diversity Partners intervention has been adopted by New York State to train its employment service providers. Diversity Partners was converted to a subscription service in May 2021 and has been purchased three times so far, including by an employment services agency in Singapore. Cornell University is



transferring this product to its School of Industrial and Labor Relations, which will maintain it and market it to disability employment service agencies. This curriculum helps to facilitate better relationships between service providers and businesses and helps inform future tool development.

#### ***Partners of Refugees in Illinois Disability Employment (PRIDE) – Grant #90IF0110: 2016–2019***

The work of a previous NIDILRR-funded grant, Partners of Refugees in Illinois Disability Employment (PRIDE), continues to be used to support advocacy work for refugees. The PRIDE research team at the University of Illinois Chicago continues to develop materials, including a **new website**, a **21-minute documentary**, and **testimonial videos**. The **Refugee Employment Training Manuals** that the PRIDE team developed have now been translated into 5 refugee languages (**Arabic**,

Amharic, French, Burmese, Tigrinya). The PRIDE team also recently developed an information technology tool designed to increase connections and referrals among refugee service providers, disability service providers, and potential employers. The team also released [on-line training modules for refugee service providers and rights-based employment training modules](#) for refugee participants. These self-paced courses are available on Moodle, including on all portable electronic devices.

## Technology for Access and Function

### *3D Printed Cochlear Electrode Arrays – Grant #90BISA002: 2019*

MEMStim LLC, a former NIDILRR SBIR Phase I grantee, has filed for patents resulting from the work completed under the grant and recently won a Phase II National Institute on Deafness and Other Communication Disorders grant to continue the development of its 3D printed cochlear electrode arrays. MEMStim also plans

to expand this technology to other areas, such as wearable sensors and animal cochlear arrays. In 2021, Dr. Angeliq Johnson, chief executive officer of MEMStim, [presented to Congress](#) about the importance of funding SBIR projects in rural and underdeveloped areas.

### *Assistive Technology Enabling Communications – Grant #90BISA0005: 2017*

An SBIR grant to Pison Technology Incorporated furthered development on an effective early-stage assistive communication device for patients with Amyotrophic Lateral Sclerosis (ALS). The wearable communication device in this project used electromyography signals to empower users with ALS and other neuromuscular disabilities to control household devices and communicate with their environment. As a result of work on this grant, Pison Technologies now has 12 patents on technology that emerged either from or with this project. This technology was featured on [PBS Newshour](#) in September 2021, showcasing its application for prosthetics to help them feel and function like real limbs.

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## HOW DOES NIDILRR COLLABORATE?

NIDILRR has an extensive history of collaborating across ACL and across federal institutions to identify best practices, conduct cosponsored research, and address shared goals. Well-established partnerships exist both within the U.S. Department of Health and Human Services and across the federal government. For example, during FY21 and FY22, NIDILRR had working partnerships with the Department of Veterans Affairs, Substance Abuse and Mental Health Services Administration, Department of Transportation, Department of Labor, Access Board, and Federal Aviation Administration.

### **Cross-Administration for Community Living Collaborations**

NIDILRR and the Administration on Disabilities (AoD) co-fund a Disability and Rehabilitation Research Project: [Minority Youth and Centers for Independent Living \(MY-CIL\)](#). This project is one of the largest co-funded investments across ACL. It is working to generate and

share new research-based knowledge that empowers Centers for Independent Living (CILs) to improve transition outcomes of out-of-school youth from minority backgrounds. Several key products were created under this grant in FY21 and FY22, including descriptive demographics of youth and young adults with disabilities who are not working and not in school and an assessment of the degree to which CILs are serving youth

from minority backgrounds. Further, work from this collaboration led to the launch of an [interactive map](#) and downloadable data briefs to help inform CILs on potential outreach efforts or programs to better reach minority youth with disabilities. Also in FY22, NIDILRR and AoD awarded grants to establish and maintain four national centers to support the work of advancing equity and inclusion for people with disabilities who face additional barriers due to other identities. Three of these grants are focused on conducting equity-based disability research, and each has multiple research projects focused on disparities experienced by disabled people of color and other marginalized identities. The funded center from AoD focuses on increasing the inclusion of multiply marginalized people with disabilities across programs and services and improving cultural competency across service delivery. All four centers, by design, come together twice per year, and each will serve as a national resource in its specific topical area. NIDILRR continues to work closely with the Administration on Aging when developing briefs or documents of mutual interest. For example, in FY22, NIDILRR subject matter experts provided input on the 2022 National Strategy to Support Family Caregivers.

### Cross-Government NIDILRR Collaborations

NIDILRR-funded research is consistently being used and shared across government in formal and informal ways. For example, in FY22, NIDILRR-funded researchers shared key findings from their work to Substance Abuse and Mental Health Services Administration colleagues to inform their work. Because of shared interests among the Access Board, Department of Transportation, and Federal Aviation Administration related to improving air travel options for people with disabilities, regular conversations and meetings around this topic occur among them. This collaboration includes connecting NIDILRR-funded researchers to key federal leaders working on policy issues on this topic. In FY22, NIDILRR-funded research was used to support several proposed and final rulemaking efforts around topics such as seat elevation for power wheelchair users and standards for height of medical diagnostic equipment. In FY21 and FY22, NIDILRR has been an ac-

tive participant in ongoing conversations, many led by the National Institutes of Health and its Centers, about diversifying the scientific workforce, including advancing opportunities for investigators with disabilities.

### Interagency Committee on Disability Research



The Interagency Committee on Disability Research (ICDR), a NIDILRR-led federal partnership, promotes a cohesive, strategic federal program of disability, rehabilitation, and independent living research; brokers partner-

ships; and facilitates coordination and collaboration among federal departments and agencies. NIDILRR's director serves as the chair of the ICDR. NIDILRR plans to build upon this leadership role, enhancing its stature as a leading sponsor of disability and rehabilitation research through new and expanding collaborations with federal partners, researchers, and developers, as well as the disability community.

In FY 2021 and 2022, the ICDR devoted significant effort toward implementing activities in the approved government-wide strategic plan required by the Workforce Innovation and Opportunity Act. The ICDR hosted a number of meetings, webinars, and teleconferences related to promoting coordination, collaboration, and partnerships. In FY 2021, the ICDR launched a new Lunch & Learn series and continued to develop the government-wide inventory of disability research. In FY 2022, the ICDR completed the development of the government-wide inventory reorganized around three new focus areas: COVID-19, disability data and statistics, and equity.

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Information in this report is sourced from the U.S. Department of Health and Human Services, Administration for Community Living, National Institute on Disability, Independent Living, and Rehabilitation Research, *2021 Annual Performance Reports* and *2022 Annual Performance Reports*, “Program Performance Report Tables 18–22.”

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Chona Kasinger/Disabled And Here





