HUMAN ENGINEERING RESEARCH LABRATORIES
VOLUME 21 NO. 2 | JULY 2022

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Covid-19: Crisis as Spur to Innovation

by Rory A Cooper

The changes that have taken place in the past two years because of the COVID-19 pandemic would have been hard to imagine prior. Nearly every region and person on planet Earth has been affected. Governments and healthcare systems have been tested and, in some cases, strained. Since the pandemic was identified, tragically over 5 million people have died because of the virus, and over 275 million people are known to have contracted the corona virus. Although several successful vaccines have been developed in record time, and medicine has advanced for treatments at an impressive rate, the pandemic continues to persist. It has become clear that it takes teamwork to gain ground towards eventually managing the pandemic and hopefully making it safe again for people to resume lifestyles like those before the virus became widespread.

Technology & Innovation
Volume 22, Number 2, March 2022, pp. 121-122(2)
DOI: https://doi.org/10.21300/22.2.2021.1

Influence of Direction and Surface Type on the Quality of Independent Wheelchair Transfer Technique

by Alicia M. Koontz, Lin Wei, Theresa Crytzer

The purpose of this study was to determine the influence of surface type (commode and level bench) and the direction of transfer (moving to and from a wheelchair) on the quality of wheelchair transfer technique and to investigate if personal characteristics such as body weight, age, and disability type are related to technique differences between the surfaces and direction of transfer.

Journal of Taiwan Occupational Therapy Association
2022, 40(1), xx-xx
DOI:10.6594/JTOTA.202206_40(1).0001

CURRENT HERL RESEARCH ABSTRACTS

Impact of the COVID-19 Pandemic on the Perceived Physical and Mental Health and Healthy Lifestyle Behaviors of People with Disabilities: Quantitative Analysis of the International Community Survey

by Yetsa Tuakli-Wosornu, Kangxin Wang, Maryam Fourtassi, Catherine Stratton, Laura Paulina Muñoz-Velasco, Abderrazak Hajjioui, Rory Cooper, Joseph K Balikuddembe, Mark Peterson, Uma Pandiyan, Andrei Krassioukov, Deo Rishi Tripathi, Angela Palomba, Bo-Young Hong

This study aims to determine the perceived impact of the coronavirus pandemic on physical and mental health and healthy lifestyle behaviors in community-dwelling persons with disabilities, as compared to those without disabilities.

American Journal of Physical Medicine & Rehabilitation: June 8, 2022 - Volume - Issue - 10.1097/PHM.0000000000002056 doi: 10.1097/PHM.0000000000002056

Perceived Physical and Mental Health and Healthy Eating Habits During the COVID-19 Pandemic in Korea

by Yetsa A Tuakli-Wosornu, Uma Pandiyan, Catherine Stratton, Youngdeok Hwang, Abderrazak Hajjioui, Laura Paulina Muñoz-Velasco, Maryam Fourtassi, Rory Cooper, Joseph K Balikuddembe, Mark Peterson, Andrei Krassioukov, Angela Palomba, Deo Rishi Tripathi, Bo Young Hong

The coronavirus disease 2019 (COVID-19) pandemic has disrupted the lives of people around the world since 2020. This study aims to reveal perceived impact of the coronavirus pandemic on physical and mental health and eating behaviors among people with disabilities and without disabilities in South Korea, as compared to other countries.

Journal of Korean Medical Science 2022; 37(15): e118.
Published online: 6 April 2022
DOI: https://doi.org/10.3346/jkms.2022.37.e118

MEET THE INTERNS AT HERL

HERL Welcomes our 2022 cohort of summer interns! This year's group of researchers, representing educational institutions from around the country, are actively engaged with their assigned mentors and teams on new design, prototyping, and analytical projects. As the summer progresses, HERL looks forward to providing a robust research experience that includes social occasions and opportunities for networking.

TO LEARN MORE ABOUT OUR BRILLIANT INTERNS FOLLOW US ON FACEBOOK @HERLPITT AND INSTAGRAM @HERLUPITT

CHECK OUT OUR 2022 PROJECTS

Dr. Cooper with Pittsburgh Mayor Ed Gainey, Allegheny County Commissioner Rich Fitzgerald, and Community Leaders

Dr. Cooper joined Pittsburgh Mayor and Allegheny County Commissioner, and community leaders from multiple sectors in a "barrier breaking" ceremony today to create a road and bike path connecting East Liberty in Pittsburgh to diverse and underserved communities in Lincoln-Larimar, with long-term goal to build further connections to broader communities and bike/pedestrian trails. It is exciting to see the emphasis on connecting diverse communities (including people with disabilities) and various modes of transportation - public transport. personal vehicles, pedestrians/wheelchair users, and bicycles/hand-cycles.

Telerehabilitation Innovation in Response to Covid-19

by D. Joshua Marino, Ronald K Poropatich, Jospeh Straatmann, Steven G Scott, Patricia Young, Michelle Nordstrom, Betty Liu, Michelle Luken, Tameika McLean, Rosemarie Cooper, Xiaoning Yuan, Paul F Pasquina, Rory A Cooper

The State of the Science Symposium is held multiple times per year to enhance the knowledge and skills of individuals working in the fields such as rehabilitation medicine, engineering, and public health. The Symposium has continually focused on the health and well-being of active-duty military members, reserve/guard components, veterans, and their families. With the onset of the COVID-19 pandemic and the social distancing protocols adopted to combat viral spread, the State of the Science Symposium was moved to an online platform to minimize risk. In December 2020, the symposium invited professionals to discuss necessary changes in their fields of practice in light of the pandemic protocols, and how telehealth has expanded to encompass multiple disciplines. It is concluded that the adoption of telemedicine as a standard of care wherever appropriate will benefit all parties involved, even after restrictions.

Technology & Innovation,
Volume 22, Number 2, March 2022, pp. 225-232(8)
DOI: https://doi.org/10.21300/22.2.2021.11

Evidence-Based Medicine Training in United States–Based Physiatry Residency Programs

by Thiru M Annaswamy, John-Ross Rizzo, Amy Schnappinger, David C Morgenroth, Julia Patrick Engkasan, Elena Ilieva, W David Arnold, Michael L Boninger, Allison C Bean, Carmen M Cirstea, Brad E Dicianno, Michael Fredericson, Prakash Jayabalan, Preeti Raghavan, Lumy Sawaki, Pradeep Suri, Stacy J Suskauer, Qing Mei Wang, Maryam Hosseini, Christina M Case, John Whyte, and Sabrina Paganoni

Although the physiatric community increasingly embraces evidence-based medicine (EBM), the current state of EBM training for trainees in physiatry is unclear. The purposes of this article are to report the results of the Association of Academic Physiatrists' surveys of physiatry residency programs in the United States, to discuss the implications of their findings, and to better delineate the "baseline" upon which sound and clear recommendations for systematic EBM training can be made. The two Association of Academic Physiatrists surveys of US physiatry residency programs reveal that most survey respondents report that they include EBM training in their programs that covers the five recommended steps of EBM core competencies. However, although most respondents reported using traditional pedagogic methods of training such as journal club, very few reported that their EBM training used a structured and systematic approach. Future work is needed to support and facilitate physiatry residency programs interested in adopting structured EBM training curricula that include recommended EBM core competencies and the evaluation of their impact.

American Journal of Physical Medicine & Rehabilitation: July 2022 - Volume 101 - Issue 7 - p S40-S44
doi: 10.1097/PHM.0000000000001752

Innovations in Telemedicine Services in Spina Bifida Clinics in the U. S. During the Covid-19 Pandemic

by Brad E. Dicianno, Hubert S. Swana, Rory A. Cooper, and Timothy J. Brei,

The COVID-19 pandemic has dramatically impacted delivery of outpatient care. Many people with spina bifida (SB) in the U.S. receive outpatient healthcare in a multidisciplinary setting. In accordance with state healthcare mandates, outpatient multidisciplinary clinic visits were deferred, postponed, or canceled, while telemedicine systems were implemented. A survey was created and distributed to all known SB clinics in the U.S. We explored the impact of the COVID-19 pandemic on the delivery of outpatient care for the SB population and the use of telemedicine in response. Novel uses of telehealth, benefits of use, suggestions for overcoming barriers, and future opportunities are identified and discussed.

Technology & Innovation, Volume 22, Number 2, March 2022, pp. 157-164(8)
DOI: https://doi.org/10.21300/22.2.2021.4

Development of a Home-Based Telerehabilitation Service Delivery Protocol for Wheelchair Seating and Mobility Within the Veterans Health Administration

by Kaila K Ott, Richard M Schein, Joseph Straatmann, Mark R Schmeler, and Brad E Dicianno

The provision of seating and wheeled mobility devices is a complex process that requires trained professionals and multiple appointments throughout the service delivery process. However, this can be inconvenient and burdensome for individuals with mobility limitations or for individuals who live in rural areas. Rural areas often present unique difficulties regarding the provision of healthcare services including lengthy travel times to medical facilities and lack of specialized providers and medical technology. The purpose of this article is to provide a comprehensive overview of the development and implementation of a service delivery protocol for a home-based telerehabilitation assessment for wheelchair seating and mobility.

Military Medicine, Volume 187, Issue 5-6, May/June 2022, Pages e718–e725, https://doi.org/10.1093/milmed/usab091

Wheelchairs and Seating Systems

by Carmen P. Digiovine, Alicia M. Koontz, Theresa F Berner, Daniel J Kim, Mark Schmeler, Rosemarie Cooper and Rory A Cooper

76 Examining a cohort of people with spinal cord injuries who use their electric wheelchair at least 40 hours per week, Worobey et al. 77 found that the frequency of repairs and the associated consequences were high in all manufacturers. Not surprisingly, the number of repairs for electric wheelchairs is considerably higher than for manual wheelchairs. 57, 76 The increased number of people requiring a DMR and the negative consequences of increased DMR repairs have placed increased demands on clinicians and physicians throughout the healthcare system. Therefore, the interdisciplinary team must understand the features that currently exist in DMRs and the indications/contraindications for their use among multiple patient populations. The objective of this chapter is to define the key characteristics of DMRs, the indications/contraindications for use and the rehabilitation technology that exists for the proper selection of DMRs.

Braddom. Physical medicine and rehabilitation 2022/1/15

Baseline Predictors of Response to Repetitive Task Practice in Chronic Stroke

by Michael A Dimyan, Stacey Harcum, Elsa Ermer, Amy F Boos, Susan S Conroy, Fang Liu, Linda B Horn, Huichun Xu, Min Zhan, Hegang Chen, Jill Whitall, George F Wittenberg

Repetitive task practice reduces mean upper extremity motor impairment in populations of patients with chronic stroke, but individual response is highly variable. A method to predict meaningful reduction in impairment in response to training based on biomarkers and other data collected prior to an intervention is needed to establish realistic rehabilitation goals and to effectively allocate resources. The objectives are To identify prognostic factors and better understand the biological substrate for reductions in arm impairment in response to repetitive task practice among patients with chronic (≥6 months) post-stroke hemiparesis.

Neurorehabilitation and Neural Repair.
2022;36(7):426-436.
doi:10.1177/15459683221095171

Epidural Stimulation of the Cervical Spinal Cord Improves Voluntary Motor Control in Post-stroke Upper Limb Paresis

by Marco Capogrosso, Marc Powell, Nikhil Verma, Erynn Sorensen, Erick Carranza, Amy Boos, Daryl Fields, Souvik Roy, Scott Ensel, Beatrice Barra, Jeffery Balzer, Jeffery Goldsmith, Robert Friedlander, George Wittenberg, Lee Fisher, John Krakauer, Peter Gerzsten, Elvira Pirondini, Douglas Weber

A large proportion of cerebral strokes disrupt descending commands from motor cortical areas to the spinal cord which can results in permanent motor de cits of the arm and hand1, 2. However, below the lesion, the spinal circuits that control movement remain intact and could be targeted by neurotechnologies to restore movement6–9. Here we demonstrate that by engaging spinal circuits with targeted electrical stimulation we immediately improved voluntary motor control in two participants with chronic post-stroke hemiparesis. We implanted a pair of 8-contact percutaneous epidural leads on the lateral aspect of the cervical spinal cord to selectively target the dorsal roots that provide excitatory inputs to motoneurons controlling the arm and hand10, 11. With this strategy, we obtained independent activation of shoulder, elbow and hand muscles. Continuous stimulation through selected contacts at speci c frequencies enabled participants to perform movements that they had been unable to perform for many years. Overall, stimulation improved strength, kinematics, and functional performance. Unexpectedly, both participants retained some of these improvements even without stimulation, suggesting that spinal cord stimulation could be a restorative as well as an assistive approach for upper limb recovery after stroke.

Biological Sciences - Article
April 13th, 2022
https://doi.org/10.21203/rs.3.rs-1523403/v1

The Impact of the COVID-19 Pandemic on Healthy Lifestyle Behaviors and Perceived Mental and Physical Health of People Living with Non-Communicable Diseases: An International Cross-Sectional Survey

by Salma Azzouzi, Catherine Stratton, Laura Paulina Muñoz-Velasco, Kangxin Wang, Maryam Fourtassi, Bo-Young Hong, Rory Cooper, Joseph K. Balikuddembe, Angela Palomba, Mark Peterson, Uma Pandiyan, Andrei Krassioukov, Deo Rishi Tripathi, Yetsa A. Tuakli-Wosornu, and Abderrazak Hajjioui

The huge burden and vulnerability imposed by non-communicable diseases (NCDs) during the COVID-19 pandemic highlighted how healthy lifestyle behaviors and the well-being of people living with NCDs need to be prioritized. The aim of our study is to better understand the impact of the COVID-19 pandemic on healthy lifestyle behaviors and perceived mental and physical health among adults living with NCDs, as compared to people without NCDs. We conducted a cross-sectional study using a global online survey through Qualtrics. Over four months, 3550 participants from 65 countries worldwide responded to the survey. The study included 3079 surveys with no missing data (complete survey responses) that were used for analysis. People with NCDs were more likely to report statistically significant worsening physical health ($p = 0.001$) and statistically insignificant worsening mental health ($p = 0.354$) when compared to pre-pandemic levels. They reported lower rates of smoking during the pandemic than those without NCDs, and a statistically significant ($p < 0.001$) relationship was found between weight gain and NCDs. Therefore, the perceived physical and mental health, including changes in body weight and tobacco consumption, of people with NCDs were significantly impacted during the pandemic. In conclusion, this study indicates that the pandemic had a significant impact on perceived physical and mental health, changes in body weight, and tobacco consumption among people with NCDs.

Int. J. Environ. Res. Public Health
2022, 19(13), 8023
doi.org/10.3390/ijerph19138023

RESEARCH ARTICLES CONTINUED

HERL NEWS

Congratulations to Nikitha Deepak for her promotion to Assistant Director for Research Coordination and Regulatory Compliance

Congratulations to D. Josh Marino for his promotion to Assistant Director for Education and Outreach, which is part of "Stakeholder Engagement Core"

Barb Klipa as Assistant Director for Operations and Administration

Jon Nocket as Research Coordinator within the "Research Coordination and Regulatory Compliance Core"

GySgt Jim Joseph, MS – Research Coordinator within the "Research Coordination and Regulatory Compliance Core"

Jim has been affiliated with HERL on/off for nearly 20 years after retiring from the US Marine Corps. He has served in various roles within HERL from administration to information technology to research coordination. Along the way he earned BS and MS degrees. He's been a friend and mentor to countless HERL students/interns, and a valued and trusted colleague. Jim was the driving force in completing the Voice of Consumer surveys, updating the HERL Registry, and built a national network of people and organizations engaged with HERL.

JOIN THE TEAM

We currently have two open positions. We are seeking another Research Coordinator with the "Research Coordination and Regulatory Compliance Core", and soon should have a position available for media and communications within the "Stakeholder Engagement Core"

Leading Practices for Improving Accessibility and Inclusion in Field, Laboratory, and Computational Science – A Conversation Series

Headed by chair of the commitee Dr. Rory A. Cooper and members Emily E. Ackerman, Christopher L. Atchison, Julian Brinkley, Sheryl Burgstahler, and Caroline M. Solomon

This series of virtual conversations explored leading practices for improving accessibility and inclusion for people with disabilities in disciplines that conduct field, laboratory, and computational research. Topics included: barriers to and accommodations for full participation or increased accessibility; commonalities and differences among promising solutions; scaling-up and sustaining successful practices; inclusion through mentoring and support networks; and changes to institutional policies and culture that encourage accessibility and inclusivity in field, laboratory, and computational science.

AWARDS AND RECOGNITIONS

HERL was noted for its achievements several times within the University of Pittsburgh School of Health and Rehabilitation Sciences "Bold Moves.

Dr. Rory Cooper led a session and presented at OT World on impact of adaptive sports on health and quality of life.

Andrea Bagay received the VAPHS Outstanding Research Staff Member of the Year Award

Dr. Brad Dicianno and colleagues recognized for work on assistive devices in the UPMC Physician Journal.

This prestigious award recognizes high-quality print and broadcast journalism, and our story won in the category of Excellence in Video/ Broadcast Journalism, Science/Environment.

Alicia Koontz Speaker at SHRS

Fellow HERL Researcher, Alicia Koontz, was a featured speaker at the SHRS InSpIRe April Monthly Seminar Series – "Promoting Physical Activity Among Wheelchair Users"

Brandon Daveler and Chang Dae Lee won the First Gear Competition for their SAVOR Project.

More information at: https://mirm-pitt.net/awards-and-recognition/first-gear-teams-shine-in-shrs-innovation-challenge/

Dr. Cooper featured in Stars and Stripes & Post Gazette for Work at HERL:

Dr. Rory Cooper, was recognized for his mission to create the Human Engineering Research Laboratories.

Patent Awarded: Toilet Seat Wrap (US Design Patent D095,0690; issued May 3, 2022) Dr. Rory A. Cooper and Rosemarie Cooper

Dr. Celia Regina Lopes a member of the Brazilian Center of Reference in Inovation - Cintesp. br and also HERL member Tecnology for the Paralimpic Sports has been recognized by the Municipality of Uberlandia in Brazil

Breelyn Styler recipient of Rehabilitation Institute Research Day 2021 Best Rehabilitation Research in the Post-doctoral

Breelyn Styler represented HERL at UPMC Institute for Rehabilitation Research "Poster Competition"

Sivashankar Sivakanthan received the Cooper-Dion Johnson Award

Dr. Cooper was awarded the "Speedy Award" from Paralyzed Veterans of America

Ahlad Neti won a RESNA Student Scientific Paper Competition Award

Congratulations to Ahlad! His paper on "Usability and acceptability of the TransKinect application for the assessment of independent wheelchair transfer technique with novice therapists." has been selected as one of the winning papers for the 2022 RESNA Student Scientific Paper Competition (SSPC).

Congratulations to the Pittsburgh VA OPPCS team – OPPCS Supervisor Andrew Chambers CPO, Amanda Gilarski CPO and research prosthetist Sara Peterson PhD, CPO FAAOP.

Congrats to HERL alumna, Ana Allegretti, for being elected to the RESNA Board of Directors

GET INVOLVED

AT HERL THERE ARE PLENTY OF WAYS TO CONTRIBUTE TO OUR CAUSE

PAID INTERNSHIPS

The mission of the Human Engineering Reserach Labratories (HERL) at the University of Pittsburgh is to continuously improve the mobility and function of people with disabilities through advanced engineering in clinical research and medical rehabilitation.

"I love learning new things about all of the projects HERL is working on and how they impact real people."

SUMMER 2022 INTERN

ELeVATE Internship

Donation funded Experiential Learning for Veterans in Assistive Technology and Engineering (ELeVATE) program

ROLLING ENROLLMENT

DURATION
5-42 weeks full-time or part-time in-person or hybrid.

REQUIREMENTS
Must be an undergraduate or graduate student in any field. Must be a veteran, National Guard, Reserve, or Cadet (ROTC or Academy)

Neilsen Research Program

Craig H. Nielsen Foundation funded internship

ROLLING ENROLLMENT
DEADLINE 10/01/2022

DURATION
8-26 weeks full or part-time in person or hybrid

REQUIREMENTS
Undergraduate or recent graduate with spinal cord injury (including spina bifida)

CONTACT JOSH MARINO FOR MORE INFORMATION AT JOSH.MARINO@PITT.EDU

STILL IN NEED OF PARTICAPANTS FOR OUR STUDIES

VOLUNTEERS NEEDED TO TEST THE CAREGIVER ASSISTED TRANSFER TECHNIQUE INSTRUMENT

Principal Investigator: Alicia Koontz, PhD

This is a research study conducted by the University of Pittsburgh. The purpose of this study is to examine the Caregiver Assisted Transfer Technique Instrument (CATT), which has been developed as a tool to assess proper technique of caregivers who provide transfer assistance to individuals with physical disabilities

YOU MAY BE ELIGIBLE TO PARTICIPATE IF YOU ARE:

- Over the age of 18 years old
- Routinely provides transfer assistance to an adult with a physical disability for at least two years
- Served as a caregiver for at least three months
- Have no formal training on assisted transfer techniques

This study will require two visits for care recipients and up to four visits for caregivers, and you will have the option to participate remotely in your home. For the first visit, you will be asked to complete surveys and perform routine transfers to be evaluated. For the second visit you will be asked to perform the same transfer procedures as visit one. Visits three and four for caregivers involve completing an online assessment of their transfer skills. Care recipients could earn up to $50 and caregivers could earn up to $100 for participation in the study. Caregivers will be given the opportunity to participate in an option sensor portion of the study for an additional $50.

FOR MORE OPPORTUNITIES LIKE THIS CHECK OUT HTTPS://WWW.HERL.PITT.EDU/PARTICIPATE

WE WOULD LOVE TO HEAR WHAT YOU HAVE TO SAY

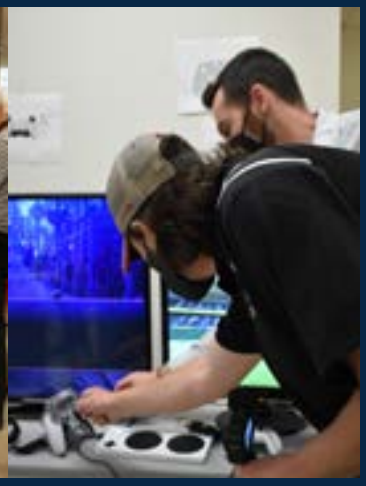
TAKE OUR SURVEY

CHECK OUT HTTPS://WWW.HERL.PITT.EDU/AVSURVEY AND BE SURE TO CHECK OUT OUR YOUTUBE VIDEO AT HTTPS//WWW.YOUTUBE.COM/

Dr. Joshua Chung with guest demonstrating the JACO arm.

Interns testing out power wheelchairs during the tour of UMPC's Center for Assistive Technology on June 3rd.

Siva Sivakanthan discussing the MeBot with visitors from the ARCS Foundation.



Josh Marino interacting with new assistive tech during the tour on June 3rd.

Without all of your support and donations, HERL wouldn't be what is without you today and for that we thank you!

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HTTPS://HERL.PITT.EDU/SUBSCRIBE

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VA Pittsburgh Healthcare System

University of Pittsburgh

National Institute on Disability, Independent Living and Rehabilitation Research

National Science Foundation

US Department of Transportation – University Transportation Center

Paralyzed Veterans of America

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